Journal of International Management 20 (2014) 91–106

Contents lists available at ScienceDirect

Journal of International Management

Fox School of Business
TEMPLE UNIVERSITY®

Cross-national differences in firms undertaking innovation initiatives: An application of institutional anomie theory ☆

Dae-il Nam [a,*], K. Praveen Parboteeah [b,1], John B. Cullen [c,2], Jean L. Johnson [d,3]

[a] Korea University Business School, Anam-Dong, Seongbuk-Gu, Seoul 136-701, Republic of Korea
[b] Management Department, University of Wisconsin, Whitewater, Whitewater, WI 53190, USA
[c] Department of Management, Information Systems, and Entrepreneurship, College of Business, Washington State University, Pullman, WA 99164-4736, USA
[d] Department of Marketing, College of Business, Washington State University, Pullman, WA 99164-4736, USA

ARTICLE INFO

Article history:
Received 23 May 2011
Received in revised form 8 May 2013
Accepted 9 May 2013
Available online 10 June 2013

Keywords:
Innovation
Anomie theory
Social institutions
National culture

ABSTRACT

In this study, we seek to explain why firms' innovations vary across countries. Drawing on institutional anomie theory (IAT), we test cross-level hypotheses related to firm innovation. Specifically, we apply the fundamental tenets of IAT to argue that innovation is an outcome of positive deviance. Further, we posit that some social institutions (e.g., education, polity) may moderate the relationships between extant cultural dimensions such as achievement, uncertainty avoidance, and in-group collectivism and innovation. To empirically explore these possibilities, we leverage data from 26,859 firms in 27 countries. Through the use of Hierarchical Linear Modeling techniques, we reveal significant interaction effects of in-group collectivism and education, uncertainty avoidance and political stability, and in group-collectivism and political stability on cross-national levels of innovation. Finally, we discuss the theoretical and practical implications of this research and describe avenues for future scholarship in this area.

1. Introduction

Most experts agree that innovation is the most important factor for organizational effectiveness and long-term survival (Amabile, 1988; Ancona and Caldwell, 1987; Edquist, 1997; Kanter, 1988; Mumford, 2000). It provides the basis for which key activities, including operational improvement, cost saving, new product creation, and resource generation, are made possible (Allred and Swan, 2004). In addition to being critical at the organizational level, innovation is also important at the national level for promoting economic development (Westwood and Low, 2003). It is therefore unsurprising to see the considerable academic effort expended to identify facilitators or inhibitors of innovation (Janssen et al., 2004).

Despite the significant effort to conceptualize innovation, we note several gaps in extant literature that form the basis of our study. First, although there are a number of variables related to cultural context that relate to innovation, the vast majority of past research has focused on understanding innovation solely in the United States. Second, many researchers have attempted to describe cross-national differences among firms that have undertaken innovative initiatives through an exclusive focus on national cultures (e.g., Herbig and Dunphy, 1998; Shane et al., 1995). However, many scholars have argued that cross-national differences are best understood through a consideration of not only national culture, but also other contextual factors (Cullen et al., 2004; Hofstede, 2001; Parboteeah and Cullen, 2003; Schooler, 1996). Third, past research has focused on organization-level features that influence innovation (Drazin and Schoonhoven, 1996). Multi-level approaches that incorporate nation-level

☆ The research is partially supported by the SK Research Fund at Korea University Business School.
* Corresponding author. Tel.: +82 2 3290 2800; fax: +82 2 922 7220.
E-mail addresses: namdaeil@korea.ac.kr (D. Nam), parbotek@uww.edu (K.P. Parboteeah), cullenj@wsu.edu (J.B. Cullen), johnsonjl@wsu.edu (J.L. Johnson).
[1] Tel.: +1 262 472 3971; fax: +1 262 472 4863.
[2] Tel.: +1 509 335 4440; fax: +1 509 335 7736.
[3] Tel.: +1 509 335 1877; fax: +1 509 335 7736.

1075-4253/$ – see front matter © 2013 Elsevier Inc. All rights reserved.
http://dx.doi.org/10.1016/j.intman.2013.05.001

variables in conjunction with organization-level variables have been neglected. Finally, many of the studies that have explored cross-national differences in innovation have relied on secondary data (e.g., patents; Faber and Hesen, 2004) or other proxy measures (e.g., R&D intensity) to develop indicators for innovation. Studies that utilize primary sources of data related to innovation within firms are needed to more accurately study the phenomenon.

To address these limitations, we use a representative sample of firms from 27 countries to examine cross-national differences in innovation. To comprehensively explain these differences, our investigation of cross-national phenomena incorporates both cultural and social institutions (Parboteeah and Cullen, 2003). To guide our selection of appropriate national-level variables, we use institutional anomie theory (IAT; Cullen et al., 2004; Rosenfeld and Messner, 1997) as the overarching framework.

Anomie theory was originally conceptualized to explain negative deviant behaviors, such as suicides (Durkheim, 1897), crime (Messner and Rosenfeld, 1994), and various other unethical behaviors (Cullen et al., 2004). Cultural and institutional drivers result in anomie (i.e., the weakening of norms) and, in turn, increase rates of deviance (Cullen et al., 2004). Although, the notion of deviance has typically been conceptualized and studied in terms of its negative consequences, it has been associated with a number of positive outcomes as well (Ben-Yehuda, 1990; Goode, 1991). For example, creativity (Fong, 2006) and entrepreneurship (Cullen et al., in press) have both been found to be related to deviance. Similarly, we propose that innovation represents a positive form of deviance. Using cultural dimensions and institutional factors, we explore their combined influence on firms' innovations. Given the conceptual and practical implications of this investigation, we argue that IAT provides a powerful framework for understanding the interaction between firm-level characteristics and national-level factors that relate to innovation.

To fully develop these multilevel, cross-cultural arguments, we organize the remainder of this manuscript in a number of interrelated sections. First, we clarify our approach by providing an operational definition of innovation. Second, we justify the use of IAT as the conceptual framework for our theoretical development. Third, we propose hypotheses that are based on the view of innovation as a form of positive deviance. Fourth, we test the multilevel and cross-cultural arguments inherent in our hypotheses through the use of data from 26,859 firms in 27 countries (World Bank, 2005). Finally, we discuss and interpret the results of our analyses, and propose managerial implications and directions for future study.

2. Firms' innovation and institutional anomie theory

2.1. Conceptual framework of innovation

In extant research, innovation has been narrowly defined such that it relates only to technological advances (Edquist, 1997). However, Schumpeter (1939: 87) argued that innovation should be understood in a much broader sense, claiming that "… innovation combines factors in a new way, or that it consists in carrying out new combinations…" Similarly, Carlsson (1995) and Nelson and Rosenberg (1993) claim that innovation should not be thought to relate only to *product* innovation, but also *process* innovation. They regard innovation "rather broadly, to encompass the process by which firms master and get into practice product designs and manufacturing processes that are new to them, whether or not they are new to the universe, or even to the nation" (Nelson and Rosenberg, 1993: 4-5). Lundvall (1992) further broadens the concept of innovation by proposing that it relates to "new forms of organization." Given these various, but related conceptualizations, we define structural innovation as the implementation of new organizational methods as a means to increase firm performance. According to this expanded definition, outsourcing major production activities or joint ventures can be considered forms of innovation.

2.2. Institutional anomie theory: Foundation, application and extension

The sociological theory of anomie (Durkheim, 1897) provides the theoretical foundation for institutional anomie theory. Durkheim (1897) first observed that institutional and cultural changes that result from modernization encourage a decline in traditional norms. This decline, in turn, results in an increased rate of deviance. According to Durkheim, anomie emerges when social change weakens the norms that regulate the activities of societal members.

Merton (1957) expands upon Durkheim's (1897) assertions to argue that a sudden social change is not the principal cause of deviant behavior. Instead, deviance results from a disconnect between culturally defined outcomes and the legitimate societal means to achieving those ends. According to Merton (1957), American culture emphasizes the achievement of material wealth, but lacks a social structure that provides legitimate ways to attain the materialistic goals it promotes. As a result, societal members may resort to crime or other deviant behaviors to achieve the material wealth that is impossible to attain through legitimate means. Research has found that when the legitimate achievement of culturally accepted goals is impeded, societies experience an increased state of anomie (Chamlin and Cochran, 2007). Faced with this anomie, an increasing number of societal members often resort to illegitimate means for achieving the prescribed goals (Cullen et al., 2004).

Merton (1957) treatment asserted that only one facet of the social system, the legitimate opportunity structure, explained anomie. Finding this conceptualization to be limited in its explanatory power, Messner and Rosenfeld (2001) and Rosenfeld and Messner (1997) further refined the theory to develop IAT. Specifically, Messner and Rosenfeld differentiated their work from Merton's by arguing that in addition to the legitimate opportunity structure, institutional factors also influence the emergence of anomie within a society. Contrary to Merton's view, Messner and Rosenfeld (1994, 2007) claimed that some societal institutions, including polity, religion, and education, may intensify societal preoccupation with material success, thus strengthening the pressure to acquire material wealth through illegitimate means. Whereas Merton's (1957) view of anomie theory suggests that the presence of economic

opportunities should mitigate anomie, Messner and Rosenfeld (1994, 2007) argued that despite opportunities to attain material wealth, institutions would intensify the pursuit of it, providing motivation to societal members to engage in illicit activities.

While anomie theory was originally developed to explain the negative manifestations of deviance, exemplified by behaviors such as suicide, it has also been provided as an extensive explanatory power in the realms of crime (Bernberg, 2002), homicides (Savolainen, 2000) and other forms of socially disapproved behaviors, such as stealing, extortion and corruption, (Cullen et al., 2004) and bribery (Martin et al, 2007). However, through advances in anomie theory (Heckert and Heckert, 2004; Mainemelis, 2010) and the perspective of positive deviance (Ben-Yehuda, 1990; Goode, 1991; Heckert and Heckert, 2002; Wolf and Zuckerman, 2012), the adaptive modes of deviance are not always noted as being negative. Some empirical evidence supports this perspective by showing that institutional anomie theory also explains the positive manifestations of deviance, such as entrepreneurship (Cullen et al., in press).

Organizational innovation is particularly well suited to the examination of creative or positive deviance (Mainemelis, 2010). In fact, a negative form of innovation (i.e., racketeering) received significant attention from Merton (1957) in one of the original anomie articles. However, recent work suggests that some individuals may instead resort to positive forms of deviance when faced with pressures emanating from a societal focus on material wealth (Casson, 2003; Cullen et al., in press; Goss, 2005; Mainemelis, 2010). We therefore extend the anomie framework to conceptualize firms' innovations as a manifestation of positive deviance. Specifically, we argue below that definitive cultural dimensions advocate strong support for material and other types of achievement. Firms in societies with these associated pressures may cope by engaging in positive deviance, namely innovation. Furthermore, consistent with Messner and Rosenfeld's (1994, 2007) treatment of IAT, we argue that specific social institutions interact with national culture to affect the pressure to attain societally defined goals. In the following section, we develop our hypotheses by explicating those cultural values that are theoretically linked to firm-level innovation.

3. Hypothesis development

Messner and Rosenfeld (2001) first argued that specific cultural norms are associated with increases in anomie and its resulting deviance. International management researchers have adapted this perspective to examine various cultural dimensions (i.e., achievement, individualism, and universalism) and their respective relationships with corruption and bribery at the individual- (Cullen et al., 2004) and firm-level (Martin et al., 2007). We similarly propose associations between specific cultural dimensions and innovation, but we further argue that these relationships are moderated by institutional systems.

National culture refers to the "learned behavioral standards, socially transmitted through personal values, norms, activities, attitudes, cognitive processes" (Allred and Swan, 2004: 82). A society's cultural values are likely to affect the actions of both its individual members and its firms. Given this, we argue that societal culture cultivates an environment in which innovation can be either encouraged or discouraged. Firms operating within this cultural context will behave in a manner consistent with the environment's inherent norms. In the section below, we summarize the relationships between achievement, uncertainty avoidance, individualism, and innovation.

3.1. National cultural values

To consider those cultural dimensions that are related to innovation, we selected cultural dimensions, based on institutional anomie theory. In particular, we followed Kostova's (1997) prescriptions of considering only those dimensions that are relevant to our study. While there are as many as nine possible cultural dimensions have been identified (see House et al., 2004), we considered only those dimensions that are relevant to the focus of our innovation study. Past work has shown achievement orientation, uncertainty avoidance, and individualism to encourage or discourage deviance from societal norms (see Cullen et al., 2004; Martin et al., 2007). Therefore, we argue that only these three national-level cultural dimensions are closely related to innovation. In addition to limiting the number of cultural dimensions we include in our model on conceptual grounds, it is also apparent that including all nine dimensions would have negative statistical consequences. Specifically, the inclusion of all nine cultural dimensions would unnecessarily overwhelm our cross-level model (Parboteeah et al., 2008). Below, we discuss each of the cultural dimensions we have identified as possible causal antecedents to innovation.

First, research has demonstrated that there exists a positive relationship between achievement orientation and innovation (Trompenaars and Hampden-Turner, 1998; Shane et al., 1995). In the cultural model, achievement orientation contrasts with ascription orientation (Trompenaars and Hampden-Turner, 1998). Specifically, achievement-oriented societies value the outcome of effort rather than ascription derived from inherited status or location in a social network. As such, in cultures with high achievement orientation, the successful accomplishment of a valued goal is the primary measure of personal worth (Cullen et al., 2004, in press; Martin et al., 2007). Achievement values, therefore, are likely to encourage people to win by any means available to them (Messner and Rosenfeld, 2001). Norms such as this are likely to be associated with higher levels of innovation.

Second, uncertainty avoidance refers to the extent to which members of an organization or society strive to avoid ambiguity through reliance on established social norms, rituals, and bureaucratic practices (Hofstede, 2001; House et al., 2004). Previous research has revealed an inverse relationship between uncertainty avoidance and innovation (Shane et al., 1995). Firms in cultures that avoid uncertainty seek to decrease the probability of unpredictable future events that may adversely affect the organization's operation. In contrast, firms in cultures characterized by a low need to avoid uncertainty exhibit more tolerance for change and ambiguity, thus accepting and sometimes embracing the risks associated with an uncertain future (Jones and Davis, 2000). Ambos and Schlegelmich (2008) argued that in cultures with low uncertainty avoidance, intra-organizational dissent is

celebrated and does not threaten the organization's survival. Because such societies are more comfortable with uncertainty and risk, low uncertainty avoidance is likely related to higher degrees of innovation.

Finally, the third cultural dimension we consider is collectivism. Similar to uncertainty avoidance, collectivism has also been shown to be negatively associated with innovation (Shane and Venkataraman, 1993). Relative to individualistic cultures, collectivistic cultures place a greater value on conformity and adherence to normative restrictions, thus impeding innovation. Shane and Venkataraman (1993) explored the innovation champion strategy and found that collectivistic cultures prefer rational innovation to renegade innovation, suggesting that the development of new ideas requires a separation from formal corporate structures (Tiessen, 1997). Thus, the characteristics of a collectivist culture, including limits on individual freedom and decision-making autonomy, as well as the subordination of individual aspirations and initiatives to those of the group, are typically considered detrimental to firm-based innovation (Jones and Davis, 2000).

3.2. Institutional balance of power

According to Scott (1995a: 499), social institutions are defined as "relatively enduring systems of social beliefs and socially organized practices associated with varying functional arenas within societal systems." Anomie theorists consider social institutions to be drivers or inhibitors of anomic conditions and the resulting deviance (Martin et al., 2007; Messner and Rosenfeld, 2001). Derived from classic functional sociology (Parsons, 1951), IAT suggests that social institutions affect structural dynamics by promoting conditions that either strengthen or weaken normative controls. Thus, the theory considers social institutions to be providers of an institutional "balance of power" (Messner and Rosenfeld, 2001). Through their incentive and regulative mechanisms, these institutions respectively enhance or diminish the cultural values described above (Aldrich and Wiedenmayer, 1993; Ingram and Clay, 2000; Kohn et al., 1997). As such, we posit that in combination with specific cultural dimensions, social institutions either amplify or diminish anomic effects.

Although a number of social institutions (e.g., family, religion, and social inequality) may influence societal anomie, extant innovation research and institutional anomie theory suggest that two social institutions are particularly likely to influence innovation (Henisz and Delios, 2001; Scott, 1995b; Ingram and Clay, 2000). As with national cultural values, we follow Kostova's (1997) prescriptions of incorporating only those variables that are relevant to the current study. Thus, we consider only education and political stability as potential moderators of the relationship between culture and innovation.

3.2.1. Education and achievement orientation

Research has shown that education is a key social institution that may affect whether, how, and when an individual accepts and adopts creative ideas and innovations (Westwood and Low, 2003). Consistent with institutional anomie theory, we argue that education creates conditions that may enhance firms' innovation initiatives. Specifically, we posit that high levels of education provide the means for societal members to achieve high occupational levels (Chamlin and Cochran, 2007). Further, a preoccupation with occupational attainment is likely a mechanism through which the desire to achieve economic rewards is cultivated. Messner and Rosenfeld (1994, 2007) supported this assertion through their research investigating how the U.S. educational system focuses on occupational attainment, which is generally associated with the pursuit of material wealth. This example suggests that as a social institution, education works in tandem with cultural forces to encourage individuals to seek materialistic outcomes. As such, a society's educational system creates an environment more conducive to innovation.

Institutional anomie theorists posit that the degree to which achievement value dominates a culture positively affects the prioritization of economic outcomes, and negatively affects concerns over the means with which those outcomes are obtained (Cullen et al., 2004). In this vein, the degree to which a society is achievement-oriented influences the likelihood with which firms are willing to deviate from societal norms and engage in innovative activities. The focus on outcomes rather than the methods with which these outcomes are attained fosters an environment in which firms are encouraged to focus on the "achievement" value. The achievement value emphasizes material gain and competition.

Individuals in well-developed educational systems may have access to greater opportunities to learn unique job skills and receive necessary training. With this experience, motivated individuals in cultures that are characterized by achievement orientation are likely to secure a higher-paying job (Blau and Duncan, 1967; Brinton, 2005). As such, strong educational systems are often associated with occupational attainment, which is in turn significantly related to the desire for material wealth. Consistent with past arguments related to institutional anomie, this focus on attainment and wealth works in tandem with cultural forces to moderate the relationship between culture and innovation. As such, educational level should accentuate the relationship between achievement orientation and innovation. We therefore propose:

Hypothesis 1. Education level accentuates the positive relationship between cultural value of achievement orientation and firm innovation.

3.2.2. Education and uncertainty avoidance

As noted above, firms within cultures characterized by low levels of uncertainty avoidance tend to utilize their innovative capabilities as a result of their respective tolerances for behaviors and opinions different from those that are common (Herbig and Dunphy, 1998). Innovation inherently involves unanticipated changes and uncertainty (House et al., 2004; Shane et al., 1995; Steensma et al., 2000; Van de ven, 1986).

Consistent with anomie theory, we propose that ambiguity often incites firm innovation, reinforcing the view that deviance from existing norms is necessary for the generation of creative ideas. However, a certain degree of confidence is required for an individual or firm to make decisions that run contrary to established norms. High levels of education are likely to cultivate this confidence. For example, research has shown that national educational programs are positively associated with firm-level risk-taking behaviors such as new venture developments (Thomas and Mueller, 2000). Additionally, innovation has been found to coincide with learning. Hobday (1997), for example, has identified educational infrastructure as the main drivers of innovation in East Asia. Similarly, Lee (1998) discovered that whereas individuals and firms that were quick to adopt new technologies were educated, those that neglected to accept new innovations were not. Education also serves to develop industry-wide human capital that plays an important role in generating innovation activity (Dakhli and Clercq, 2004).

However, consistent with institutional anomie theory, education level is positively associated with desire for materialistic outcomes, which is likely to result in stronger anomic pressures in turn. As firms react to anomic pressures through positive deviance, it is possible that such deviance will offset any negative effects of high uncertainty avoidance on innovation. Therefore, we propose the following hypothesis:

Hypothesis 2. Education level mitigates the negative relationship between cultural value of uncertainty avoidance and firm innovation.

3.2.3. Education and in-group collectivism

According to institutional anomie theory, an individualistic concern refers to a self-centered orientation and egoistic goal pursuit (Martin et al., 2007; Messner and Rosenfeld, 2001). Relative to collectivistic cultures, individualistic cultures tend to be more competitive, thus pressuring societal members to disregard traditional normative restrictions on the pursuit of personal success (Cullen et al., 2004; Messner and Rosenfeld, 2001). When individuals pursue personally relevant objectives, they are encouraged to do so without the assistance of others. Given this, individualism may enhance anomie by encouraging individual disengagement from the collective. This can result in reduced conformity to social norms, which is essential for increasing innovation.

Due to the anomic conditions that encourage egoistic goal-seeking at the expense of considering the means employed to achieve those goals, individuals often engage in negative deviance behaviors (e.g., crime) to attain success (Messner and Rosenfeld, 2001). However, we argue that individualism can also result in positive forms of deviance, such as innovation. Such effects are likely accentuated by high levels of education because high levels of education likely provide firms with the means to achieve innovation. Put differently, the inherent anomic pressures that result from high levels of education are likely to heighten the effects of individualism on innovation. Given that individualism (collectivism) intensifies (reduces) competition, education provides the means with which individuals can achieve personal success. We therefore propose:

Hypothesis 3. Education level mitigates the negative relationship between cultural value of in-group collectivism and firm innovation.

3.2.4. Political stability and achievement orientation

A second key social institution that works in tandem with cultural forces is polity. Institutional anomie theorists suggest that polity mobilizes and distributes power to accomplish collective goals (Messner and Rosenfeld, 2001: 65). In this study, we consider one critical aspect of polity—political stability. Research has determined political stability to be an important institutional factor (Henisz and Delios, 2001; Kaufmann, 2005; Kaufmann et al., 2003; Martin et al., 2007) because a government's commitment to a given set of policies is of substantial import for a firm's strategic behavior (Kobrin et al., 1980). As such, extant scholarship has suggested that polity can the effects of cultural values on anomie and/or deviance (Cullen et al., in press).

According to IAT, strong political stability facilitates competition because of an emphasis on economic achievement (Messner and Rosenfeld, 1997). Firms recognize their dependence on political stability to effectively compete with one another. Therefore, in societies with high political stability, firms are more likely to engage in fair competition and pursue economic achievement. This focus on economic achievement may result in anomic pressures that incite firms to engage in positive deviant behaviors. However, in politically unstable societies in which successful firms are those with substantial political connections, competition can be undermined.

Given these issues, we argue that political stability accentuates the effects of achievement orientation on innovation. More specifically, we assert that both political stability and a cultural orientation towards achievement are likely to create conditions that emphasize economic and materialistic achievements, thus generating societal anomie. Consistent with IAT, we argue that firms will engage in positive deviance (i.e., innovation) to address pressures associated with polity-induced anomie. Thus, we hypothesize as follows:

Hypothesis 4. Political stability accentuates the positive relationship between cultural value of achievement orientation and firm innovation.

3.2.5. Political stability and uncertainty avoidance

In contrast to the accentuating effect of political stability on the relationship between achievement orientation and innovation, political stability is likely to mitigate the negative influence of uncertainty avoidance on innovation. There are two key justifications for this assertion. First, political stability is likely associated with a strong emphasis on economic achievements. This focus can also result in anomic pressures that motivate firms to adapt through positive deviance. As a result, in societies characterized by a strong tendency to avoid uncertainty, the anomic pressures of high political stability are likely to diminish the negative effects of uncertainty avoidance on innovation.

Second, when political stability is low, firms minimize the degree to which they commit to the market and avoid investment (Delios and Henisz, 2003; Henisz and Delios, 2001). Uncertainty in public policy exacerbates difficulties associated with collecting, organizing, and interpreting information necessary for the management of innovation activities. For instance, Laeven and Woodruff (2004) found that in Mexico, federated states that have effective legal systems reduce idiosyncratic risk, thus enabling the growth of entrepreneurial firms. Research has also shown that political stability is related to property rights. By examining the emergence of new firms in five former-Soviet countries, Johnson et al. (2000, 2002) found that political instability is negatively correlated with the security of property rights. In turn, reduced security of property rights inhibits innovation to a degree greater than inadequate finances. In contrast, political stability is likely to create conditions whereby innovation is possible. These conditions are thus likely to moderate the negative relationship between uncertainty avoidance and innovation.

Hypothesis 5. Political stability mitigates the negative relationship between cultural value of uncertainty avoidance and firm innovation.

3.2.6. Political stability and in-group collectivism

Finally, we argue that political stability enhances the effect of individualism on innovation. As outlined above, political stability incites a greater focus on economic and materialistic achievements. These conditions can result in anomic pressures to which firms will respond with positive forms of deviance. When working in tandem with the positive effects of individualism on innovation, it is feasible to argue that political stability enhances the effect of individualism on innovation. Furthermore, firms in individualistic societies tend to be free from societal norms and adopt unconventional, innovative practices (Wejnert, 2002). In the absence of political stability, a firm's ability to be innovative would likely be constrained. Therefore, we posit that political stability is likely to enhance the effects of individualism on innovation. We hypothesize as follows:

Hypothesis 6. Political stability mitigates the negative relationship between cultural value of in-group collectivism and firm innovation.

4. Method

4.1. Sample

To test the hypotheses proposed in the previous section, we used a multilevel data set at both the firm- and country levels of analysis. All firm level data were drawn from the World Bank survey (The World Bank Group, 2005), which was provided by the Inter-University Consortium for Political and Social Research. The survey is a cross-national questionnaire that includes respondents from 73 countries and 51,169 firms. The survey is principally intended to identify and gauge (a) the largest obstacles to enterprise growth, and (b) the effects of a country's investment climate on national competitiveness.

The survey features two sections that respectively feature questions geared towards collecting qualitative and quantitative data. In the qualitative section, questions relate to ownership structure, investment climate, business-government relations, innovation, and labor relations. Items in the quantitative section are concerned with productivity and financial accounts. Firm stakeholders, such as development research institutions, indigenous development agencies, or statistical bureaus administered the survey to participating firms. Professional enumerators interviewed key respondents, including managing directors, human resource managers, and accountants. Other details related to the survey's composition and administration is available at the World Bank Group's website (www.worldbank.org).

Following data collection, we matched data from the 73 countries with the cultural variables identified in the GLOBE study (House et al., 2004), as well as the social institution data and additional reliable indicators of our variable. Our final sample consisted of 26,859 firms from 27 countries. Sixty-eight percent of our sample consisted of firms from the manufacturing industry; 25% of sample firms were from the service industry; and the remaining 7% consisted of firms from other industries. Approximately 90% of our sample was comprised of small- to medium-sized firms that employ fewer than 500 employees. The median age of sample firms was 15 years at the time of data collection.

4.2. Variables and data sources

4.2.1. Dependent variable: Firms' innovation initiatives

Because we seek to directly explore the actual innovation activities in which the firms took part, we do not allow any variables to serve as proxies (i.e., R&D intensity) for innovation. Instead, to measure firm-level innovation, the World Bank survey asked firms about the extent to which they have undertaken ten different innovation initiatives in the last three years. Ten items representing a firm's innovations were presented to the respondents. These innovation-related activities were categorized into product innovations (developing a major new product line), process innovations (upgrading an existing product line), technological innovations (introducing a new and substantial change of technology, obtaining a new license agreement), and structural innovations (discontinuing a product line, opening a new plant, closing a new plant, agreeing to a new joint venture, outsourcing a major production activity, and bringing outsourced production in-house). Appendix A presents the questions in their entirety. We aggregated the scores to these ten questions, providing a cumulative innovation score that ranged from 0 to 10 (higher scores indicated greater involvement in innovation activity). Although this indicator for innovation is not continuous in

the classical sense, its aggregation renders it a more continuous measure across the 27 sampled countries (Salimath, 2006). Cronbach's alpha for this scale was high (0.90).

4.2.2. National culture

We used measures from the Global Leadership and Organizational Behavior Effectiveness (GLOBE) study by House et al. (2004) as indicators for country-level cultural values of achievement, uncertainty avoidance, and in-group collectivism. Approximately 150 social scientists and management scholars from 62 countries were engaged in this broad, long-term, and cross-national project. The GLOBE measures not only theoretically align with our arguments, but also account for contemporary theoretical advancements by recent data (see Cullen et al., 2004; Martin et al., 2007; Parboteeah and Cullen, 2003).

Two characteristics of the GLOBE study are salient to the current research. First, GLOBE researchers conducted their analyses at the organization- and country-level rather than the individual level (Smith, 2006). Hanges and Dickson (2006) subjected the GLOBE data to a confirmatory factor analysis, revealing that the data had organization- and nation-level properties that were not accounted for at the individual level. Because our theoretical assertions are largely contingent on firm-level factors, the inclusion of the GLOBE dimensions is useful in the current study. Second, the GLOBE study's scales were designed to differentiate between organizational and societal cultures. They were not developed identify differences within cultures or between individuals. As stressed by GLOBE project researchers, "the scales are most immediately useful to cross-cultural rather than intra-cultural researchers" (House et al., 2004: 146). Thus, the scales used in the GLOBE study are appropriate for comparing data at the country-level.

It is also noteworthy that the GLOBE study distinguished cultural values and the practices that are associated with them. In the GLOBE study, the term "value" was used to indicate the average score of individual attitudes. The label "practices" was used to indicate those values that managers perceive as being expressed in their societies. In other words, the value dimension refers to judgments about the way things should be, and the practice dimension refers to judgments about the way things are. Because we were interested in the actual beliefs held in a society, we used the latter of these two measurements. To eliminate any culturally biased response patterns (e.g., respondents from Asia tended to avoid the extreme ends of the scales), we used the adjusted scores for the GLOBE measures (House et al., 2004).

To gauge national-level achievement orientation, we used the performance-orientation items from the GLOBE project. This construct refers to "the extent to which a community encourages and rewards innovation, high standards, and performance" ($\alpha = .72$; House et al., 2004: 239). This dimension comprises a future orientation, such as Confucian Dynamism (Hofstede and Bond, 1988; House et al., 2002). Uncertainty avoidance is defined as "the extent to which members of collectives seek orderliness, consistency, structure, formalized procedures, and laws to cover situations in their daily lives" ($\alpha = .77$; House et al., 2004: 603). Finally, the GLOBE measure for in-group collectivism is "the degree to which individuals express pride, loyalty, and interdependence in their family" ($\alpha = .88$; House et al., 2004: 463). Details of the GLOBE measures are presented in Appendix A.

4.2.3. Social institutions

Our measures for country-level social institutions are drawn from the literature on political economy and sociology. These measures have been widely used in business and management research, and have been accepted as conceptually valid (e.g., Cullen et al., 2004; Delios and Henisz, 2003; Martin et al., 2007).

To gauge education level, we used the United Nations Development Programme's educational attainment score (United Nations Development Programme, 2002). This score is widely accepted as a valid indicator of country-level emphasis on education (e.g., Cullen et al., 2004; Parboteeah and Cullen, 2003; Salimath, 2006). As such, we perceive it to reflect a country's education level. The scores for this scale were calculated by adding two-thirds of the adult literacy rate to one-third of the mean number of years that a country's citizens have been in school (see Appendix A).

To measure political stability, we employed an aggregate measure of World Bank indicators (Kaufmann, 2005). This index is meant to reflect respondents' perceptions regarding the likelihood that a government will be destabilized or overthrown through unconstitutional or violent means. As such, this index captures the notion that the quality of a country's political governance can be compromised by the likelihood of volatile changes in the central government. Data collected by a number of institutions, including the World Bank (the Governance Indicators), the World Economic Forum (the Executive Opinion Survey), Transparency International (Corruption Perception Index) and the Freedom House (political and civil liberties and freedom of the press), were used to develop indicators for political stability. We believe that the inclusion of a broad range of sources is critical for comprehensively examining cross-cultural differences. To adjust for variations in the component indicators' metrics, we standardized the composite scores for national culture and other institutional variables.

4.2.4. Country-level control variables

Extant innovation research has suggested that a country's gross domestic product (GDP) is related to innovation at the firm-level. Specifically, a low GDP indicates a limitation on the resources and market capacity required to develop new technologies (Pianta, 1995). To rule out this possibility, we controlled for GDP. GDP values were obtained from the United Nations Human Development Report (2002) and were log transformed prior to the analysis.

4.2.5. Firm-level control variables

To isolate firm-specific variations, we also considered firm-level control variables based on the World Bank survey. First, organizational slack theorists suggest that the size of an organization may mitigate potential losses when firms take risks, thus promoting innovation. However, many population ecologists argue that organizational size generates structural inertia that inhibits

firm innovation (Nohria and Gulati, 1996). Given these contradictory conclusions, we control for firm size by including each organization's number of employees as a covariate. Second, organizational literature suggests that there exists a negative relationship between a firm's age and its proclivity for innovation (Kimberly and Evanisko, 1981). To rule out this potential bias, we also controlled for firm age. Third, because it can diminish the effects of a country's culture and social institutions on innovation, we controlled for the percentage of companies in a country that were foreign-owned (Frost, 2001). Fourth, we controlled for industry effects with categorical variables whereby firms in the manufacturing industry were coded as 1, and all other firms were coded as 0. Fifth, to rule out the possibility that different organizational resources may have differential effects on innovation (Nohria and Gulati, 1996), we controlled for firm performance by covarying market share, capacity utilization, and profit reinvestment. Sixth, the association between state ownership and a firm's level of innovation has been investigated in the privatization literature (e.g., Molas-Gallart and Tang, 2006). Because past research has suggested that state-owned companies are economically inefficient (McKinnon, 1994) and thus inhibit innovation, we controlled for state ownership of firms. To gauge state ownership, respondents were asked to indicate the percentage of their firm that is owned by the government or state. Finally, because multinational corporations invest significant resources towards developing new products abroad (Ogbuehi and Bellas, 1992), we believe that the degree to which a corporation engages in foreign operations can affect innovation. As such, we controlled for the existence of foreign operations with a simple dummy variable indicating a firm's possession (1) or lack thereof (0) of operations in other countries.

4.3. Analysis technique: Hierarchical Linear Modeling

Data analyses that have explored different levels of data have been explained using a variety of terms, including multilevel (Kozlowski and Klein, 2000), cross-level (Rousseau, 1985), meso- (House et al., 1995), or mixed determinant (Klein et al., 1994) models. In this study, we offer a cross-level analysis regarding the effect of country level-characteristics (e.g., national culture and social institutions) on firm-level innovation. Despite its utility for investigating multiple levels of data, this nested model introduces a problem regarding the independence of observations. Because the assumption of independence is violated when data is structured hierarchically, ordinary least squares (OLS) methods are insufficient. OLS methods produce standard errors that are too small, which leads to a higher incidence of null hypothesis rejection relative to when data consist of independent observations (Osborne, 2000).

One statistical technique that has been used for analyzing multilevel models is referred to as Hierarchical Linear Modeling (HLM; Hanges et al., 2004; Hofmann, 1997). The conceptual logic of HLM hinges on the notion that the respective models for estimating country-level parameters (level 2) and firm-level parameters (level 1) are computed simultaneously. One model calculates the relationships within each of the lower level units, and the other demonstrates how these intra-unit relationships vary between units (Hofmann, 1997). This approach explicitly models both individual- and group-level residuals, and thus considers the partial interdependence of individuals within the same group. Typically, estimates derived through HLM closely correspond to those that would be gleaned through OLS, with the exception that level-2 standard errors are not as deflated as they would be in OLS approaches.

HLM has several advantages over OLS approaches for the purposes of our analyses. First, we did not assume that most heterogeneity is located at the chosen level (e.g., firm-level innovation), nor did we assume that the alternate levels of analysis (e.g., country-level culture or social institutions) are more or less homogeneous. Second, the focal level of analysis (i.e., firm-level innovation) acted independently from other levels of analysis. For example, firm-level heterogeneity (e.g., variations in innovation within firms across countries) was assumed to be relatively independent of the institutional environments that affected firms in different contexts. As such, we leveraged Hierarchical Linear Modeling to simultaneously estimate country-level and firm-level parameters, thereby avoiding issues related to homogeneity and independence that might have produced spurious empirical findings (Gupta et al., 2007; Klein et al., 1994; Rothaermel and Hess, 2007).

Because our hypotheses examined the main effects of level-2 variables on the mean level-1 outcome (innovation) and were adjusted for the within-level-1 predictors, we followed previous management research (see Cullen et al., 2004; Martin et al., 2007; Parboteeah and Cullen, 2003) and used intercept-as-outcome models rather than a slope-as-outcome model. Furthermore, given that our analyses were geared towards exploring the effects of culture and institutional variables on innovation, we centered the level-1 variables at the group mean (i.e., country). We also examined the uncentered data, but the results were identical. To test for interaction effects, we used the product terms of education, political stability, and cultural variables. Because the product terms were tested at level 2, we adhered to the practices employed by previous researchers (e.g., Bryk and Raudenbush, 1992; Cohen et al, 2003) by centering the data from level 2 at the grand mean when the interaction terms were included.

Given this, we tested for main effects using the following set of equations, which comprised model 1:

$$\begin{aligned} INNO_{ij} = {} & \beta_{0j} + \beta_{1j}GOV_{ij} + \beta_{2j}OPER_{ij} + \beta_{3j}SIZE_{ij} \\ & + \beta_{4j}YEAR_{ij} + \beta_{5j}FOREIGN_{ij} + \beta_{6j}INDUSTRY_{ij} \\ & + B_{7j}MS_{ij} + \beta_{8j}CAPA_{ij} + \beta_{9j}REINV_{ij} + r_{ij} \end{aligned} \quad \text{(level1)}$$

$$\begin{aligned} \beta_{0j} = {} & \gamma_{00} + \gamma_{01}ACH_j + \gamma_{02}UNCER_j + \gamma_{03}COLLEC_j \\ & + \gamma_{04}EDU_j + \gamma_{05}POL_j + \gamma_{06}GDP_j + u_{ij,} \end{aligned} \quad \text{(level2)}$$

where INNO represents innovation for firm i in country j and β_{0j} signifies the mean level of innovation. GOV represents the percentage of companies that are owned by the government in that country. OPER is a dummy-coded variable that indicates

whether the firm conducts operations abroad. SIZE represents firm size, and YEAR denotes the firm age. FOREIGN represents the percentage of foreign company ownership; INDUSTRY denotes the industry in which the firm operates; MS denotes the market share of the firm; CAPA represents the capacity utilization ratio of the firm; and REINV denotes the reinvesting of profits. Further, r_{ij} represents the individual deviation of the ijth innovation measurement (the extent of innovation for firm i in country j) from the mean innovation in firm i in country j (i.e., from β_{0j}); γ_{00} corresponds to the mean innovation in country j. ACH denotes achievement orientation; UNCER corresponds to uncertainty avoidance; COLLEC denotes collectivism; EDU represents educational attainment; POL signifies political stability; GDP denotes gross domestic product; and finally, u_{ij} represents the deviance from country j's mean innovation (overall observation).

To test for interaction effects, the product terms were added into the equations:

$$\begin{aligned} INNO_{ij} = {} & \beta_{0j} + \beta_{1j}GOV_{ij} + \beta_{2j}OPER_{ij} + \beta_{3j}SIZE_{ij} \\ & + \beta_{4j}YEAR_{ij} + \beta_{5j}FOREIGN_{ij} + \beta_{6j}INDUSTRY_{ij} \\ & + B_{7j}MS_{ij} + \beta_{8j}CAPA_{ij} + \beta_{9j}REINV_{ij} + r_{ij} \end{aligned} \quad \text{(level1)}$$

(Model 2)

$$\begin{aligned} \beta_{0j} = {} & \gamma_{00} + \gamma_{01}ACH_j + \gamma_{02}UNCER_j + \gamma_{03}COLLEC_j \\ & + \gamma_{04}EDU_j + \gamma_{05}POL_j + \gamma_{06}GDP_j \\ & + \gamma_{07}EDU * ACH_j + \gamma_{08}EDU * UNCER_j \\ & + \gamma_{08}EDU * COLLEC_j + u_{ij} \end{aligned} \quad \text{(level2)}$$

(Model 3)

$$\begin{aligned} \beta_{0j} = {} & \gamma_{00} + \gamma_{01}ACH_j + \gamma_{02}UNCER_j + \gamma_{03}COLLEC_j \\ & + \gamma_{04}EDU_j + \gamma_{05}POL_j + \gamma_{06}GDP_j \\ & + \gamma_{07}POL * ACH_j + \gamma_{08}POL * UNCER_j \\ & + \gamma_{09}POL * COLLEC_j + u_{ij} \end{aligned} \quad \text{(level2)}$$

where EDU represents education, and EDU * ACH, EDU * UNCER and EDU * COLLEC represent the respective interaction effects between education and achievement orientation, uncertainty avoidance, and collectivism. Similarly, POL * ACH, POL * UNCER and POL * COLLEC indicate the respective interaction effects between political stability and achievement orientation, uncertainty avoidance, and collectivism.

5. Results

Table 1 presents a matrix of correlations and descriptive statistics associated with the variables under investigation in this study. To equalize the contributions of each country independent of the size of the sample drawn, we weighted each country's data by its sample size (Parboteeah and Cullen, 2003). We also independently reviewed the correlations on the basis of level-1 and level-2 variables (see Table 2). The correlation matrices indicated that there was no cause for concern regarding the data.

For our multilevel analysis, we estimated a fully unconditional model (without any predictors) before examining a more complex model. Using intraclass coefficients (ICC), we investigated the existence of significant variation among countries. The resulting ICC value is 30.72%, and the associated Chi square statistics indicate that a subsequent amount of the variance in firm innovation exists at the country level ($\chi^2 = 13986.2$, d.f. $= 26$, $p < 0.001$). Thus, we determined the unconditional model to be appropriate for a multilevel analysis. Given this conclusion, we proceeded to the complex model. Through this model, we found that cultural variables accounted for 18.3% of the variance in innovation. Interactions between cultural variables and social institutions respectively explained 22.4% and 12.5% of the variance in innovation.

Table 3 reports the results of our HLM analyses, including the standardized coefficients of country-level and individual-level variables predicting innovation. Model 1 includes the control variables; Model 2 presents the main effect of culture on innovation; Model 3 tests the respective interaction effects between education and cultural variables; and Model 4 tests the respective interaction effects between political stability and cultural variables.

When adjusted for firm-level differences, the tests associated with the country-level hypotheses demonstrate significant effects of culture on innovation. Although we did not propose any hypotheses regarding the direct effect of culture on innovation, our results replicate those that have been found in previous research. For example, we observed a positive main effect of achievement orientation on innovation ($\gamma_{01} = 0.37$; $p < .001$) and a negative main effect of uncertainty avoidance and innovation ($\gamma_{02} = -0.49$; $p < .001$). Finally, our results suggested that a negative relationship exists between the degree to which a nation is collectivistic in nature and innovation ($\gamma_{02} = -0.29$; $p < .01$).

The hypotheses regarding social institutions primarily focused on two country-level predictors of innovation: education level and political stability. Our treatment of IAT suggests that these social institutions may moderate the relationship between culture and innovation. Results of these analyses are reported in Models 3 and 4. Whereas Hypotheses 3, 5 and 6 were supported, Hypotheses 1, 2, and 4 were not.

Table 1
Descriptive statistics and cross-level correlations.[a]

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. SIZE	216.52	1202.00	1.00															
2. IND	0.69	0.46	0.02	1.00														
3. FOREIGN	1.87	0.33	−0.07	−0.05	1.00													
4. YEAR	20.38	16.63	0.11	0.13	0.04	1.00												
5. GOV	5.95	22.90	0.14	−0.12	0.08	0.18	1.00											
6. OPER	0.07	0.26	0.06	0.01	−0.26	0.06	−0.02	1.00										
7. MS	18.92	27.24	0.01	−0.01	−0.02	0.07	0.01	0.04	1.00									
8. CAPA	76.37	21.35	0.02	−0.20	−0.05	−0.07	−0.01	0.03	0.00	1.00								
9.REINV	43.62	40.34	−0.02	0.03	0.02	0.02	−0.08	0.04	0.00	0.04	1.00							
10. INNO	2.59	1.93	0.06	0.13	−0.11	0.04	−0.07	0.16	0.05	0.00	0.16	1.00						
11. UNCER	4.93	0.43	0.07	−0.01	−0.04	0.02	0.16	0.00	0.00	0.00	−0.15	−0.16	1.00					
12. INGR	5.54	0.34	0.05	0.26	−0.05	−0.02	0.06	−0.03	−0.04	−0.14	−0.13	−0.18	−0.11	1.00				
13. PERFO	5.87	0.29	0.06	0.21	−0.03	0.04	0.07	0.03	0.02	−0.10	−0.09	−0.05	0.74	0.23	1.00			
14. EDU	0.83	0.14	0.00	−0.45	−0.02	−0.08	0.07	0.04	0.05	0.20	0.04	0.24	−0.07	−0.48	−0.27	1.00		
15. POL	0.09	0.63	−0.03	−0.34	−0.02	−0.03	0.03	0.00	−0.10	0.17	0.00	0.00	0.21	−0.53	−0.16	0.54	1.00	
16. GDP	8961.25	7582.47	−0.04	−0.48	0.01	−0.04	−0.03	0.04	−0.02	0.26	0.07	0.15	−0.04	−0.69	−0.29	0.74	0.74	1.00

[a] Correlations of .013 or greater are significant at $p < .05$. Correlations greater than .018 are significant at $p < .01$. Level 1: $n = 2, 6859$, Level 2: $n = 27$.

Table 2
Descriptive statistics and level-1 correlations.[a]

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1. SIZE	216.52	1202	1.00									
2. IND	0.69	0.46	0.02	1.00								
3. FOREIGN	1.87	0.33	−0.07	−0.05	1.00							
4. YEAR	20.38	16.63	0.11	0.13	0.04	1.00						
5. GOV	5.95	22.90	0.14	−0.12	0.08	0.18	1.00					
6. OPER	0.07	0.26	0.06	0.01	−0.26	0.06	−0.02	1.00				
7. MS	18.92	27.24	0.01	−0.01	−0.02	0.07	0.01	0.04	1.00			
8. CAPA	76.37	21.35	0.02	−0.20	−0.05	−0.07	−0.01	0.03	0.00	1.00		
9.REINV	43.62	40.34	−0.02	0.03	0.02	0.02	−0.08	0.04	0.00	0.04	1.00	
10. INNO	2.59	1.93	0.06	0.13	−0.11	0.04	−0.07	0.16	0.05	0.00	0.16	1.00

[a] Correlations of .01 or greater are significant at $p < .05$. Correlations greater than .02 are significant at $p < .01$. Level 1: n = 2, 6859, Level 2: n = 27.

To gain a better understanding of these findings, we plotted the interaction effects for Hypotheses 3, 5, and 6 on graphs depicted in Figs. 1 and 2. The interactions were plotted on the basis of standard scores for firm-level innovation and the country-level variables. This allowed all variables to be plotted on the same scale, rather than individually on the basis of their unique metrics. The plots were designed to illustrate the effects of cultural variables on innovation given high (+1 s.d.) and low (−1 s.d.) levels of the social institution variables (Martin et al., 2007).

Fig. 1 illustrates the relationship between country-level collectivism and innovation at high and low degrees of the institutional variables. Results show that the education level significantly moderates the negative relationship between collectivism and firm-level innovation, thus supporting Hypothesis 3. Specifically, when a nation is characterized by low levels of education, collectivism becomes a strong negative predictor of firm-level innovation. Contrarily, when a country's education level is high, the negative relationship between collectivism and innovation becomes less pronounced.

Table 3
Results for HLM analysis of firm-level innovation.

Variables	Parameter estimates											
	Model 1			*Model 2*			*Model 3*			*Model 4*		
	b		s.e.	b		s.e.	b		s.e.	b		s.e.
National culture												
Achievement orientation				0.37	***	0.05	0.21		0.13	0.38	***	0.07
Uncertainty avoidance				−0.49	***	0.05	−0.36	**	0.09	−0.51	***	0.07
In-group collectivism				−0.29	**	0.07	−0.31	***	0.07	−0.31	***	0.07
Social institutions												
Education	0.04		0.13	−0.19		0.10	−0.15		0.11	−0.10		0.11
Political stability	−0.27	*	0.13	−0.02		0.07	−0.03	*	0.08	0.03	*	0.08
Interaction effects												
Achieve × Edu							0.27		0.17			
Uncert × Edu							−0.13		0.15			
Collect × Edu							0.20	*	0.10			
Achieve × Pols										−0.11		0.09
Uncert × Pols										0.19	†	0.08
Collect × Pols										0.15	**	0.05
Control variables												
Size	0.25	***	0.04	0.25	***	0.04	0.25	***	0.04	0.25	***	0.04
State ownership	−0.02	*	0.01	−0.02	**	0.01	−0.02	**	0.01	−0.02	**	0.00
Market share	0.10	*	0.04	0.09	*	0.04	0.09	*	0.04	0.09	*	0.04
Capacity utilization	−0.04	*	0.02	−0.04	*	0.02	−0.04	*	0.02	−0.04	*	0.02
Reinvestment	0.07	***	0.01	0.07	***	0.01	0.07	***	0.01	0.07	***	0.01
Age	0.01		0.01	0.02		0.01	0.02		0.01	0.02		0.01
Operations abroad	0.32	***	0.06	0.32	***	0.06	0.33	***	0.06	0.32	***	0.06
Industry	0.34	***	0.03	0.33	***	0.03	0.34	***	0.03	0.33	***	0.03
Foreign ownership	0.10	*	0.04	0.11	**	0.04	0.10	**	0.04	0.11	**	0.04
GDP[a]	0.17		0.17	−0.01		0.15	0.05		0.21	−0.00		0.20
χ^2	5487.19624	***		3277.24920	***		2359.25820	***		3365.56823	***	

Level 1: n = 2, 6859, Level 2: n = 27.
[a] GDP was log transformed prior to analysis.
† $p < .10$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

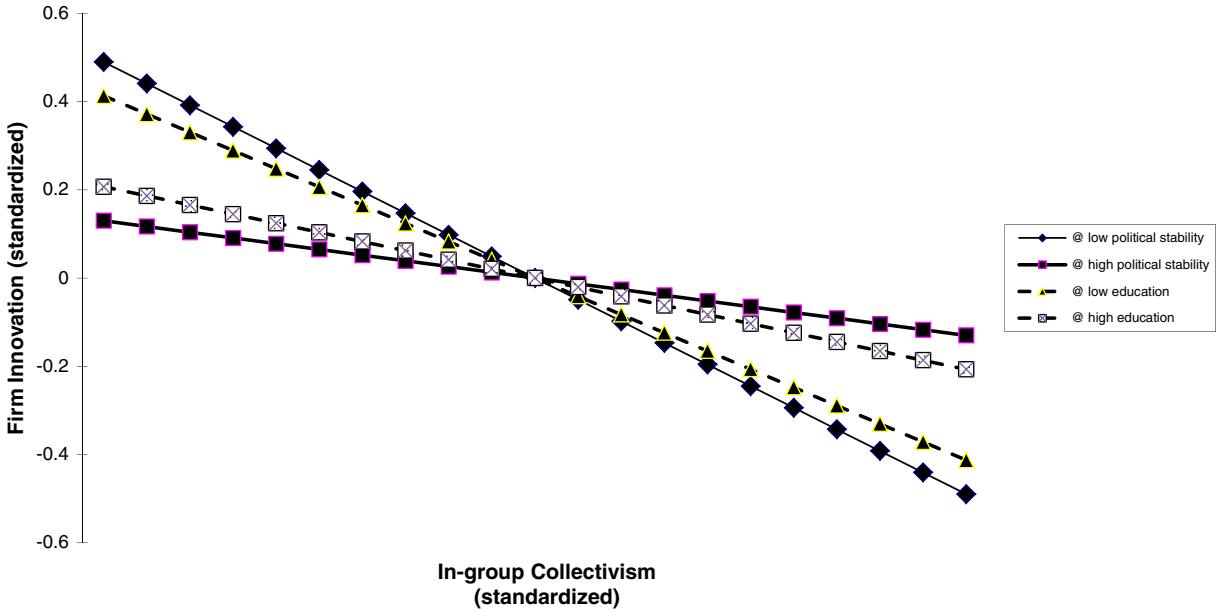

Fig. 1. In-group collectivism at selected levels of education and political stability.

The moderating effect of political stability followed a similar pattern to that of education. As Hypothesis 5 predicted, the negative effect of nation-level uncertainty avoidance on firm-level innovation was diminished by increasing levels of political stability increased (see Fig. 2). Finally, consistent with Hypothesis 6, our results demonstrate that high levels of political stability diminish the negative effects of collectivism on firm innovation (see Fig. 1). In contrast to the main effects, the interaction effects effectively demonstrate the conditions under which cultural variables behave in accordance with IAT.

6. Discussion

Through this study, we sought to use the framework of IAT to explain the emergence of positive deviance in the form of firm-level innovation. Our results provide general support for the effects of the country-level achievement orientation, uncertainty avoidance, and collectivism on firm-level innovation. Furthermore, by drawing on IAT (Messner and Rosenfeld,

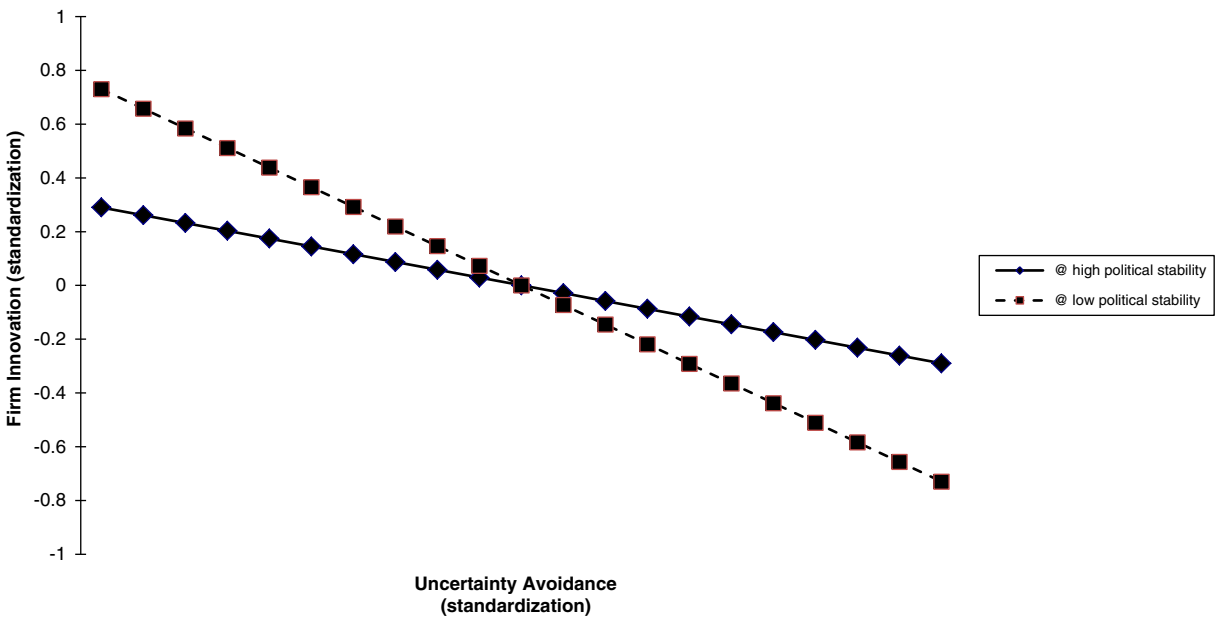

Fig. 2. Uncertainty avoidance at selected levels of political stability.

2001), we show that social institutions significantly moderate the respective relationships between these cultural variables and firm-level innovation. These results generally confirm our chosen theoretical framework as a means to explain the cross-national differences in firm innovation.

In addition, our results related to the effect of cultural variables on innovation were generally consistent with those reported in past research on the topic. Societal achievement orientation reduces inhibitions related to the use of radical means to achieving desired outcomes, thereby encouraging the utilization of deviant methods to do so (e.g., innovation). Because societies characterized by high levels of uncertainty avoidance circumvent the anomic conditions required to instigate creativity, they seem to inhibit innovation. Furthermore, collectivist cultures demand conformity and discourage deviant behavior in which societal members buck normative restrictions. As such, we found societal collectivism to inhibit innovation as well.

Our findings, in particular, emphasize the effects of social institutions on innovation. Our results confirmed the effect of a "balance of power" on innovation (Messner and Rosenfeld, 2001), thus demonstrating the capacity of social institutions to moderate the relationships between normative controls and innovation. Consistent with IAT, some social institutions, such as a strong educational system and political stability, appeared to offset the influence of cultural values on innovation. Generally, education fosters the degree to which a nation can produce human capital, and this capacity for learning plays an important role in generating innovation. Similarly, political stability diminishes the negative effects of cultural values on innovation by limiting the extent to which societal members must concern themselves with other issues, such as insecure property rights.

Despite the findings that supported many of our hypotheses, a number of other hypotheses were not supported. For instance, our results did not reveal a significant interaction effect between education and achievement orientation. Though this is surprising, it is possible that countries that are strongly oriented towards achievement also tend to have strong educational systems. Therefore, there may exist a ceiling effect associated with achievement orientation's influence on innovation such that a nation's education is unable to strengthen the relationship any further. We also found that education did not diminish the negative effect of uncertainty avoidance on firm innovation. Although we can only speculate on this result, it is possible that fear of the unknown is so strong in nations characterized by high degrees of uncertainty avoidance that any potential mitigating effect of education is rendered moot.

In sum, two of our hypotheses regarding education were rejected. It is possible that our failure to find support for these hypotheses may be a result of the type of education that we studied. Our study included a general measure of education accessibility in a society. However, a recent study of German universities suggests that education focused on entrepreneurship had an effect on students' desires to be self-employed (Walter et al., 2013). Given this, it is possible that examining forms of education that are more geared towards innovation and creativity may yield significant results.

Similar to our non-significant findings associated with education, we also found that political stability did not accentuate the effects of achievement orientation on innovation. It may be that countries that are politically stable also tend to have strong orientations toward achievement. Like the non-significant moderating effect of education on the relationship between achievement orientation and innovation, countries with strong proclivities towards achievement may experience a ceiling effect on innovation such that social institutions (like political stability) are unable to make that relationship more pronounced. Given this possibility, we suggest that future studies continue to focus nation-level achievement orientation as it relates to different forms of innovation.

Our theoretical framework, methods, and findings build upon past research, particularly those studies that incorporated firm-level control variables that are related to firm-level innovation. Our results show that geographical and governmental mechanisms are causal antecedents to firm innovation. For example, we found that foreign ownership and the presence of foreign operations increased innovation, even after controlling for various societal variables. Future work in this area may benefit from focusing on these variables to elucidate how they interact with social institutions in promoting firm-level innovation.

Our findings provide significant contributions to the literature in a number of ways. First, unlike previous studies that have (a) focused primarily on national culture, or (b) employed variables devoid of supporting theory, our application of IAT provided a framework that guided our selection of variables to include in the models. We developed a multilevel model of innovation that includes both organization-level and national-level factors that may affect innovation. This approach allowed us to draw data from a variety of national contexts, including 26,859 firms from 27 countries. More importantly, however, we theorized that firm innovation was a form of positive deviance intended to adapt to anomic conditions caused by cultural values that interact societal institutions.

Second, our treatment of IAT differentiated positive "deviant" phenomena from other culturally deviant behaviors, such as firm-level bribery (Martin et al., 2007), unethical behaviors (Cullen et al., 2004) and homicides (Savolainen, 2000), thus providing evidence for the robustness of this approach.

Third, we contributed to an understanding of how social institutions affect innovation. To this end, we demonstrated that nation-level education and political stability are important drivers of innovation in any society. Finally, our application of HLM provides a methodological model for addressing cross-level hypotheses and avoiding problematic issues inherent in linear regression techniques.

Practically, this study provides valuable insights into locating global R&D operations for multinational companies (MNC; Jones and Davis, 2000). Specifically, our findings reveal links between certain cultural characteristics and successful innovative activity and identify macro-level institutional factors that can moderate those relationships. As firms adapt to an increasingly globalized world by developing an international presence, profiles of cultural and institutional conditions offer firms sources of competitive advantage. Our results may serve as a practical tool for assisting multinational managers to make important decisions regarding locations for their operations that may encourage innovation.

Although we were able to develop theoretically grounded and reliable measures for testing our arguments, this study has several limitations. First, our use of secondary data restricted the dependent variables we could observe and the countries from which we could sample. However, as cross-national data (e.g., Hofstede, 2001; Trompenaars and Hampden-Turner, 1998) are becoming more available to researchers, we recommend that future studies incorporate measures from multiple cultural contexts to validate our

cross-country models. Second, the majority of our sample was comprised of respondents from the manufacturing industry. Given this, researchers should be cautious about generalizing our results to other industries. Future research in this area would benefit from a sample that is more heterogeneous. Third, our models incorporated only a limited number of social institutions that we believed would interact with the cultural variables in predicting firm-level innovation. However, because our sample consisted of respondents from 27 countries, we were restricted in terms of the number of independent variables we could consider. Nevertheless, we feel that future studies should incorporate data from a greater number of countries, thus allowing for the evaluation of other social institutions, such as religion or family. Fourth, we considered interactions among variables at only two levels. Therefore, we recommend that future cross-level studies examine whether contextual variables moderate individual relationships between firm-level predictors and dependent variables. Finally, our study had a cross-sectional design. A longitudinal study that examines institutional changes over time may promote an even greater understanding of their effects on innovation.

While the above limitations offer a number of future avenues for research in this area, our general findings also provide additional directions for future scholarship. First, our counterintuitive results concerning the interaction between education and cultural variables suggest that this relationship should be examined more extensively. Second, we believe that future research should examine nation-level achievement orientation as an antecedent of innovation more closely. Our results demonstrate that achievement orientation sets a high baseline for innovation that renders social institutions incapable of accentuating its effects. To explore this possibility more comprehensively, we suggest that future researchers consider other social institutions as moderators of the relationship between achievement orientation and innovation. Third, future scholarship in this domain should consider cultural schemas identified by other theorists (e.g., Trompenaars and Hampden-Turner, 1998) to replicate our results with other cultural dimensions. Finally, we recommend that future research compares other cross-national frameworks, such as country institutional profiles (Kostova, 1997), to assess the predictive power of each approach.

Acknowledgements

This research was partially supported by the Korea University Research Grant.

Appendix A

Innovation ($\alpha = .90$) (*The World Bank Group's Productivity and Investment Climate Survey*)
"Has your company undertaken any of the following initiatives in the last three years?" (0 = No, 1 = Yes).

1. Developed a major new product line
2. Upgraded an existing product line
3. Introduced new technology that has substantially changed the way that the main product is produced
4. Discontinued at least one product (not production) line
5. Opened a new plant
6. Closed at least one existing plant or outlet
7. Agreed to a new joint venture with a foreign partner
8. Obtained a new licensing agreement
9. Outsourced a major production activity that was previously conducted in-house
10. Brought in-house a major production activity that was previously outsourced

National culture variables (*GLOBE Study*)
(Unless indicated, all items 1 = strongly agree, 7 = strongly disagree)
Performance orientation ($\alpha = .72$)

1. In this society, students are encouraged to strive for continuously improved performance (reverse scored).
2. In this organization, employees are encouraged to strive for continuously improved performance (reverse scored).

In-group collectivism ($\alpha = .77$)

1. In this society, children take pride in the individual accomplishments of their parents (reverse scored).
2. In this society, parents take pride in the individual accomplishments of their children.
3. In this organization, group members take pride in the individual accomplishments of their group.
4. In this organization, group managers take pride in the individual accomplishments of group members.

Uncertainty avoidance ($\alpha = .88$)

1. In this society, orderliness and consistency are stressed, even at the expense of experimentation and innovation (reverse scored).
2. In this society, societal requirements and instructions are spelled out in detail so citizens know what they are expected to do (reverse scored).
3. In this organization, orderliness and consistency are stressed, even at the expense of experimentation and innovation (reverse scored).
4. In this organization, job requirements and instructions are spelled out in detail so employees know what they are expected to do (reverse scored).

Social Institution Variables

Educational attainment (*United Nations Human Development Report*)

Education index = 2/3 * Adult Literacy Index + 1/3 * Gross Enrollment Index, where Adult Literacy Index and Gross Enrollment Index are percentages

Political stability (Kaufmann, 2005; *World Bank*)

Aggregate of data from more than 12 institutions worldwide: World Bank (the Governance Indicators), World Economic Forum (the Executive Opinion Survey), Transparency International (Corruption Perception Index), Freedom House (political and civil liberties and freedom of the press), etc.

References

Aldrich, H.E., Wiedenmayer, G., 1993. From traits to rates: an ecological perspective on organizational foundings. In: Katz, J.A., Brockhaus, R.H. (Eds.), Advances in Entrepreneurship, Firm Emergence, and Growth. JAI Press, Greenwich, CT, pp. 145–195.

Allred, B.B., Swan, S., 2004. Global versus multidomestic: culture's consequences on innovation. Management International Review 44 (Special issue 1), 81–105.

Amabile, T.M., 1988. A model of creativity and innovation in organizations. In: Staw, B.M., Cummings, L.L. (Eds.), Research in Organizational Behavior. JAI Press, Greenwich, CT, pp. 187–209.

Ambos, B., Schlegelmich, B.B., 2008. Innovation in multinational firms: Does cultural fit enhance performance? Management International Review 48 (2), 189–206.

Ancona, D., Caldwell, D., 1987. Management issues facing new product teams in high technology companies. In: Lewin, D., Lipsky, D., Sokel, D. (Eds.), Advances in Industrial and Labor Relations. JAI Press, Greenwich, CT, pp. 191–221.

Ben-Yehuda, N., 1990. Positive and negative deviance: more fuel for a controversy. Deviant Behavior 11, 221–243.

Bernberg, J.G., 2002. Anomie, social change and crime. British Journal of Criminology 42, 729–742.

Blau, P., Duncan, O., 1967. The American Occupational Structure. Wiley, New York.

Brinton, M.C., 2005. Education and the economy. In: Smelser, N.J., Swedberg, R. (Eds.), The Handbook of Economic Sociology. Princeton University Press, Princeton, NJ, pp. 575–602.

Bryk, A.S., Raudenbush, S.W., 1992. Hierarchical Linear Models. Newbury Park, CA, Sage.

Carlsson, B., 1995. Technological Systems and Economic Performance: The Case of Factory Automation. Kluwer, Dordrecht.

Casson, M., 2003. The Entrepreneur: An Economic Theory, second ed. Edward Elgar, Cheltenham, UK.

Chamlin, M.B., Cochran, J.K., 2007. An evaluation of the assumptions that underlie institutional anomie theory. Theoretical Criminology 11, 39–61.

Cohen, J., Cohen, P., West, S.G., Aiken, L.S., 2003. Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences. Lawrence Erlbaum Associates, New York.

Cullen, J.B., Parboteeah, P.K., Hoegl, M., 2004. Cross national differences in manager's willingness to justify ethically suspect behaviors: a test of institutional anomie theory. Academy of Management Journal 47 (3), 411–421.

Cullen, J.B., Johnson, J., Parboteeah, K.P., 2013. National rates of opportunity entrepreneurship activity: insights from institutional anomie theory. Entrepreneurship Theory and Practice. http://dx.doi.org/10.1111/etap.12018 in press.

Dakhli, M., Clercq, D.D., 2004. Human capital, social capital, and innovation: a multi-country study. Entrepreneurship & Regional Development 16 (2), 107–128.

Delios, A., Henisz, W.J., 2003. Political hazards, experience, and sequential entry strategies: the international expansion of Japanese firms, 1980–1998. Strategic Management Journal 24, 1153–1164.

Drazin, R., Schoonhoven, C.B., 1996. Community, population, and organizational effects on innovation: a multilevel perspective. Academy of Management Journal 39 (5), 1065–1083.

Durkheim, É., 1897. Suicide: A Study in Sociology. Free Press, New York (1966).

Edquist, C., 1997. Systems of Innovations. Pinter, London.

Faber, J., Hesen, A.B., 2004. Innovation capabilities of European nations: cross-national analyses of patents and sales of product innovations. Research Policy 33, 193–207.

Fong, C.T., 2006. The effects of emotional ambivalence on creativity. Academy of Management Journal 49 (5), 1016–1030.

Frost, T.S., 2001. The geographic sources of foreign subsidiaries' innovations. Strategic Management Journal 22, 101–123.

Goode, E., 1991. Positive deviance: a viable concept. Deviant Behavior 12, 289–309.

Goss, D., 2005. Schumpeter's legacy? Interaction and emotions in the sociology of entrepreneurship. Entrepreneurship Theory and Practice 29 (2), 205–218.

Gupta, A.K., Tesluk, P.E., Taylor, M.S., 2007. Innovation at and across multiple levels of analysis. Organization Science 18, 885–897.

Hanges, P.J., Dickson, M.W., 2006. Agitation over aggregation: clarifying the development of and the nature of the GLOBE scales. The Leadership Quarterly 17 (5), 522–536.

Hanges, P.J., Dickson, M.W., Sipe, M.T., 2004. Rationale for GLOBE statistical analyses: societal rankings and tests of hypotheses. In: House, R.J., Hanges, P.L., Javidan, M., Dorfman, W.W., Gupta, V. (Eds.), Culture, Leadership, and Organizations: The Globe Study of 62 Societies. Sage Publications, Thousand Oaks, CA, pp. 219–237.

Heckert, A., Heckert, D.M., 2002. A new typology of deviance: integrating normative and reactivist definitions of deviance. Deviant Behavior 23, 449–479.

Heckert, A., Heckert, D.M., 2004. Using an integrated typology of deviance to expand Merton's anomie theory. Criminal Justice Studies: A Critical Journal of Crime, Law and, Society 17, 75–90.

Henisz, W.J., Delios, A., 2001. Uncertainty, imitation, and plant location: Japanese multinational corporations, 1990–1996. Administrative Science Quarterly 46 (3), 443–475.

Herbig, P., Dunphy, S., 1998. Culture and innovation. Cross Cultural Management 5 (4), 13–21.

Hobday, M., 1997. Innovation in East Asia: The Challenge to Japan, new edition. Edward Elgar, Cheltenham, UK.

Hofmann, D.A., 1997. An overview of the logic and rationale of hierarchical linear models. Journal of Management 24, 613–641.

Hofstede, G., 2001. Culture's consequences, second edition. Sage Publications, Thousand Oaks, CA.

Hofstede, G., Bond, M.H., 1988. The Confucius connection: from cultural roots to economic growth. Organizational Dynamics 16, 4–21.

House, R.J., Rousseau, D.M., Thomas, D., 1995. The MESO paradigm: a framework for the integration of micro and macro organizational behavior. In: Cummings, L.L., Staw, B.M. (Eds.), Research in Organizational Behavior. JAI Press, Greenwich, CT, pp. 71–114.

House, R.J., Javidan, M., Hanges, P., Dorfman, P., 2002. Understanding cultures and implicit leadership theories across the globe: an introduction to project GLOBE. Journal of World Business 37, 3–10.

House, R.J., Hanges, P.L., Javidan, M., Dorfman, W.W., Gupta, V., 2004. Culture, Leadership, and Organizations: The Globe Study of 62 societies. Sage Publications, Thousand Oaks, CA.

Ingram, P., Clay, K., 2000. The choice-within-constraints new institutionalism and implications for sociology. Annual Review of Sociology 26, 525–546.

Janssen, O., Vliert, E.V.D., West, M., 2004. The bright and dark sides of individual and group innovation: a special issue introduction. Journal of Organizational Behavior 25, 129–145.

Johnson, S., McMillan, J., Woodruff, C., 2000. Entrepreneurs and the ordering of institutional reform: Poland, Slovakia, Romania, Russia and the Ukraine compared. The Economics of Transition 8, 1–36.

Johnson, S., McMillan, J., Woodruff, C., 2002. Property rights and finance. American Economic Review 92, 1335–1356.

Jones, G.K., Davis, H.J., 2000. National culture and innovation: Implications for locating global R&D operations. Management International Review 40 (1), 11–29.

Kanter, R., 1988. When a thousand flowers bloom: structural, collective, and social conditions for innovation in organizations. In: Staw, B.M., Cummings, L.L. (Eds.), Research in Organizational Behavior. JAI Press, Greenwich, CT, pp. 169–211.

Kaufmann, D., 2005. Myths and Realities of Governance and Corruption. World Bank, pp. 81–95 (September).

Kaufmann, D., Kraay, A., Mastruzzi, M., 2003. Governance matters III: governance indicators for 1996–2002. World Bank Policy Research Department Working Paper.
Kimberly, J.R., Evanisko, M.J., 1981. Organizational innovation: the influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. Academy of Management Journal 24 (4), 689–713.
Klein, K.J., Dansereau, J., Hall, R.J., 1994. Levels issues in theory development, data collection, and analysis. Academy of Management Review 19, 195–229.
Kobrin, S., Basek, J., Blank, S., La Palombara, J., 1980. The assessment and evaluation of noneconomic environments by American firms. Journal of International Business Studies 11, 32–47.
Kohn, M.L., Slomczynski, K.M., Janicka, K., Khmelko, V., 1997. Social structure and personality under conditions of radical change: a comparative analysis of Poland and Ukraine. American Sociological Review 62, 614–638.
Kostova, T., 1997. Country institutional profiles: concept and measurement. Academy of Management Best Paper Proceedings, pp. 180–189.
Kozlowski, S.W.J., Klein, K.J., 2000. A multi-level approach to theory and research in organizations: contextual, temporal and emergent processes. In: Klein, J.J., Kozlowski, S.W.J. (Eds.), Multilevel Theory, Research, and Methods in Organizations. Jossey-Bass, San Francisco, CA, pp. 3–9.
Laeven, L.A., Woodruff, C., 2004. The quality of the legal system and firm size. Working Paper.
Lee, C., 1998. Determinants of national innovativeness and international market segments. International Marketing Review 7 (5), 39–49.
Lundvall, B.A., 1992. National Systems of Innovation: Towards a Theory of Innovation and Interactive Learning. Pinter Publishers, London.
Mainemelis, C., 2010. Stealing fire: creative deviance in the evolution of new ideas. Academy of Management Review 35, 558–578.
Martin, K.D., Cullen, J.B., Johnson, J.L., Parboteeah, K.P., 2007. Deciding to bribe: a cross-level analysis of firm and home country influences on bribery activity. Academy of Management Journal 50 (6), 1401–1422.
McKinnon, R.I., 1994. Financial growth and macroeconomic stability in china, 1978–1992: implications for Russia and other transitional economies. Journal of Comparative Economics 18 (3), 438–469.
Merton, R.K., 1957]. Social Theory and Social Structure. The Free Press, New York.
Messner, S.F., Rosenfeld, R., 2001]. Crime and the American Dream. Wadsworth, Belmont, CA.
Messner, S.F., Rosenfeld, R., 1997. Political restraint of the market and levels of criminal homicide: a cross-national application of institutional-anomie theory. Social Forces 75, 1393–1416.
Messner, S.F., Rosenfeld, R., 2007. Crime and the American Dream, fourth ed. Wadsworth, Belmont, CA.
Molas-Gallart, J., Tang, P., 2006. Ownership matters: intellectual property, privatization and innovation. Research Policy 35 (2), 200–212.
Mumford, M.D., 2000. Managing creative people: strategies and tactics for innovation. Human Resource Management Review 10, 313–351.
Nelson, R.R., Rosenberg, N., 1993. Technical innovation and national systems. In: Nelson, R.R. (Ed.), National Innovation Systems: A Comparative Analysis. Oxford University Press, New York, pp. 3–28.
Nohria, N., Gulati, R., 1996. Is slack good or bad for innovation? Academy of Management Journal 39 (5), 1245–1264.
Ogbuehi, A.O., Bellas, R.A., 1992. Decentralized R&D for global product development: strategic implications for multinational corporations. International Marketing Review 9 (5), 60–70.
Osborne, J.W., 2000. Advantages of hierarchical linear modeling. Practical Assessment, Research & Evaluation 7 (1), 1–3.
Parboteeah, P.K., Cullen, J., 2003. Social institutions and work centrality: explorations beyond national culture. Organization Science 14 (2), 137–148.
Parboteeah, K.P., Hoegl, M., Cullen, J.B., 2008. Managers' gender role attitudes: a country institutional profile approach. Journal of International Business Studies 39, 795–813.
Parsons, T., 1951. The Social System. Free Press, New York.
Pianta, M., 1995. Technology and growth in OECD countries, 1970–1990. Cambridge Journal of Economics 19, 175–187.
Rosenfeld, R., Messner, S., 1997. Markets, morality, and an institutional anomie theory of crime. In: Passas, N., Agnew, R. (Eds.), The Future of Anomie Theory. Northeastern University Press, Boston, pp. 207–224.
Rothaermel, T., Hess, A., 2007. Building dynamic capabilities: innovation driven by individual firm, and network-level effects. Organization Science 18, 898–921.
Rousseau, D.M., 1985. Issues of level in organizational research: multilevel and cross-level perspectives. In: Cummings, L.L., Staw, B. (Eds.), Research in Organizational Behavior. JAI, Greenwich, CT, pp. 1–37.
Salimath, M.S., 2006. Social institutions and culture as drivers of cross-national entrepreneurial activity: application and extensions of institutional anomie theory of entrepreneurship. (Ph.D. Dissertation) Washington State University.
Savolainen, J., 2000. Inequality, welfare state, and homicide: further support for the institutional anomie theory. Criminology 38, 1021–1042.
Schooler, C., 1996. Cultural and sociocultural explanations of cross-national psychological differences. Annual Review of Sociology 22, 323–349.
Schumpeter, J.A., 1939. Business Cycles: A Theoretical, Historical and Statistical Analysis of the Capitalist Process. Martino Publishing, Eastford, CT.
Scott, W.R., 1995a. Institutions and Organisations. Sage, Thousand Oaks, CA.
Scott, W.R., 1995b. The adolescence of institutional theory. Administrative Science Quarterly 32 (4), 1987, 493-511.
Shane, S., Venkataraman, S., 1993. Renegade and rational internal corporate venture championing strategies in global corporations. In: Moore, D.P. (Ed.), Academy of Management Best Papers Proceedings.
Shane, S., Venkatraman, S., MacMillan, I., 1995. Cultural differences in innovation championing strategies. Journal of Management 21 (5), 931–952.
Smith, P.B., 2006. When elephants fight, the grass gets trampled: The GLOBE and Hofstede projects. Journal of International Business Studies 37, 915–921.
Steensma, H.K., Marino, L., Weaver, K.M., Dickson, P.H., 2000. The influence of national culture on the formation of technology alliances by entrepreneurial firms. Academy of Management Journal 43 (5), 951–973.
Thomas, A.S., Mueller, S.L., 2000. A case for comparative entrepreneurship: assessing the relevance of culture. Journal of International Business Studies 31 (2), 287–301.
Tiessen, J.H., 1997. Individualism, collectivism, and entrepreneurship: a framework for international comparative research. Journal of Business Venturing 12, 367–375.
Trompenaars, F., Hampden-Turner, C., 1998. Riding the Waves of Culture: Understanding Diversity in Global Business. McGraw-Hill, New York.
United Nations Development Programme, 2002. Human Development Reports (http://hdr.undp.org).
Van de Ven, A., 1986. Central problems in the management of innovation. Management Science 32 (5), 590–607.
Walter, S., Parboteeah, K.P., Walter, A., 2013. Entrepreneurship resources of university departments, individual influences, and students' entrepreneurial intentions: a cross-level analysis. Entrepreneurship Theory and Practice 37 (2), 175–200.
Wejnert, B., 2002. Integrating models of diffusion of innovations: a conceptual framework. Annual Review of Sociology 28, 297–326.
Westwood, R., Low, D.R., 2003. The multicultural muse: culture, creativity and innovation. International Journal of Cross Cultural Management 3 (2), 235–259.
Wolf, B., Zuckerman, P., 2012. Deviant heroes: nonconformists as agents of justice and social change. Deviant Behavior 33 (8), 639–654.
World Bank, 2005. World Development Report 2005.