

THREE ESSAYS ON INNOVATION AND ENTREPRENEURSHIP: CULTURE,
INTERNATIONALIZATION AND INITIAL PUBLIC OFFERINGS

By
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To the Faculty of Washington State University:

The members of the Committee appointed to examine the dissertation of DAE-IL NAM find it satisfactory and recommend that it be accepted.

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THREE ESSAYS ON INNOVATION AND ENTREPRENEURSHIP: CULTURE,
INTERNATIONALIZATION AND INITIAL PUBLIC OFFERINGS

Abstract

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This dissertation investigated the issue of innovation and innovation and entrepreneurship within three broad contexts: US domestic, internationalization and cross-cultural contexts. The first essay investigated U.S. new ventures that went public from 2001 to 2003. I particularly looked into earnings management at the time of lockup expiration. We found that there are significant negative price reactions when the lockup agreements expire. Further, this study shows that the amounts of negative abnormal returns at lockup expiration provide a good signal to predict IPO firms' earnings management because insiders want to maximize their wealth when they are free to sell their shares. Finally, we also found the subsequent roles of venture capitalists that influence new ventures to manage earnings at the time of IPOs.

The second essay examines the international entrepreneurship. I particularly focus on internationalization from emerging countries rather than from the developed countries. We develop a multi-level theoretical model using firm- and country-level factors to systematically assess the reasons for internationalization for such firms. We find that technological and human dependence on foreign countries are positively associated with internationalization. Further, cross-level effects suggest that favorable institutional environments that provide critical

resources to such firms enhance their likelihood for internationalization to overcome their dependence on foreign sources.

Finally, the third essay investigates a cross-cultural analysis on innovation. Given that simple unequivocal notion of cultural dimensions is not satisfactory to explain the true nature of culture, this study introduces the notion of “cultural ambivalence” to explain firm innovation. We believe that each society has multiple and ambivalent concepts of culture so that researchers can distinguish between practices (“as is”- meaning the way things are) and values (“should be”- meaning the way things should be). Data for 26,859 firms from 27 countries was analyzed using Hierarchical Linear Modeling (HLM). Results show that “as-is” cultural values are strong predictors for firm level innovation. Furthermore, this study provides the empirical evidence that the state of cultural ambivalence could be a source of change in a society.

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Dedication

This dissertation is dedicated to my wife, Soyeon Lee

CHAPTER ONE

INTRODUCTION

Unlike other traditional dissertations, this dissertation follows a new format. Specifically, this dissertation consists of three essays. I investigate the issue of innovation and entrepreneurship within three broad contexts: US domestic, internationalization and cross cultural contexts. The first essay investigates U.S. new ventures that went public from 2001 to 2003. I particularly looked into earnings management at the time of lockup expiration. In an IPO context, original IPO shareholders who want to sell some of their holdings must wait until the lockup expiration date, which is typically 180 days. Once the lockup period is over, the pre-IPO shareholders are free to sell their shares. I investigate the negative price reaction at the time of the lockup agreement expires. Furthermore, this study also addresses the possibility that the amounts of negative abnormal returns at lockup expiration may provide a good signal to predict IPO firms' earnings management because insiders want to maximize their wealth when they are free to sell their shares. Finally, we also look into subsequent roles of venture capitalists that influence new ventures to manage earnings IPO.

The second essay addresses the phenomenon of international entrepreneurship. I particularly focused on internationalization from emerging countries rather than from the developed countries. We develop a multi-level theoretical model using firm- and country-level factors to systematically assess the reasons for internationalization for such firms. Using cross level analysis, we argue that firms in emerging economies pursue internationalization to

overcome both technology and human capital dependence, particularly when the institutional environments are favorable in their home countries.

Finally, in my third essay, I investigate a cross-cultural analysis on innovation. It has often been assumed that national cultures have strong and unequivocal characteristics. However, research has shown that the simple unequivocal notion of cultural dimensions is not satisfactory to explain the true nature of culture. This study attempts to fill this gap by introducing the notion of “cultural ambivalence” to explain firm innovation. We believe that each society has multiple and ambivalent concepts of culture so that researchers can distinguish between practices (“as is”- meaning the way things are) and values (“should be”- meaning the way things should be). Drawing from psychology, sociology, and management theories, we tested cross-level hypotheses regarding firm innovation. Data for 26,859 firms from 27 countries were analyzed using Hierarchical Linear Modeling (HLM).

CHAPTER TWO

PAPER ONE

KEEP LOOKING ATTRACTIVE UNTIL YOU SELL: EARNINGS MANAGEMENT, AND THE ROLE OF VENTURE CAPITALISTS

Abstract

Original IPO shareholders who want to sell some of their holdings must wait until the lockup expiration date which is typically 180 days. Once the lockup period is over, the pre-IPO shareholders are free to sell their shares. We found there is significant negative price reaction at the time of the lockup agreement expires. Further, this study shows that the amounts of negative abnormal returns at lockup expiration provide a good signal to predict IPO firms' earnings management because insiders want to maximize their wealth when they are free to sell their shares. Finally, we found the subsequent role of venture capitalists that influence new ventures to manage earnings IPO. The results are robust while we control for the endogeneity problems. Implications for theorists, investors and policy makers are discussed.

INTRODUCTION

Initial public offerings (IPOs) are characterized as little publicly available information other than their offering prospectus (DuCharme, Malatesta, & Sefcik, 2001). There is almost no media coverage of the new ventures in the years before the IPO (Rao, 1993; Teoh, Wong, & Rao, 1998). Even after the IPO, limited operating histories as a public firm leave investors

significantly under-informed. As such, an informational asymmetry occurs between insider shareholders and potential outside investors. This condition provides a good incentive for IPO firms to manipulate, or manage, reported earnings (DuCharme et al., 2001).

Several studies have provided evidence that IPOs manage pre-IPO earnings opportunistically (e.g., Aharony, Li, & Loeb, 1993; Teoh, Welch, & Wong, 1998; Teoh et al., 1998(b)). Their findings show that inflated earnings before an IPO firm goes public raise the IPO firm's offer price and consequently increase the IPO proceeds. Instead of the pre-IPO stage, this paper primarily focuses on stock price and earnings management after the new venture went public. Specifically, we argue that lock-up provision provide a situation where potential agency problems may occur. For example, most IPOs feature lockup agreements that prohibit insiders from selling share before a specific date. Insiders are free to sell the shares once the lockup is lifted. Interestingly, managers do not usually sell any of their own shares in IPOs due to the harmful signal to market but instead wait until the lockup provision expires (Field & Hanka, 2001). To maximize the wealth when they are free to sell their shares, insiders allow the stock to be artificially underpriced (Aggarwal, Krigman, & Womack, 2002). The strategically underpriced shares increase market demand in the near future when they can sell so that insiders can cash out their shares at higher prices. With this same motivation, it is plausible that pre-IPO shareholders are eager to keep the stock price high until the lockup expiration. Given insiders may pursue their own interests at the expense of potential investors, we want to examine if insiders engage in managing earnings around the days of the lockup expiration.

While a substantial body of literature has explored the certification role of venture capitalists (VCs) prior to the IPOs, it is relatively insufficiently analyzed whether they actually

help new ventures (Arthurs & Busenitz, 2006; Jain, Jayaraman, & Kini, 2008). In the pre-IPO stage, most VCs have strong incentives to nurture and support the new ventures so they may successfully go public because VCs' rewards are contingent upon the success of their investment. When VCs assent to a lockup provision, this is viewed as a good signal to the market in that the VCs show substantial commitment to the new ventures. However, VCs are no longer bonded to stay with the firm after the lockup expires. This may heighten the probability that VCs may influence a new venture to report positive earnings so that VCs can cash out at premium. In fact, research shows that VCs have conflicts of interests with other stakeholders (Arthurs, Hoskisson, Busenitz, & Johnson, 2008) because they tend to have a short-term investment horizon and do not appear to protect the longer-term interests of the new venture. VCs often exit new ventures with a premium but leave their firms less viable in the future. Evidence further shows that VCs are significantly responsible for the Internet IPO bubble (Biddle, 2001; Buckman, 2001; Mills, 2001; Morsfield & Tan, 2006) by artificially boosting the stock prices. When VC ownership concentration is higher, long-term venture survival even decreases (Fisher & Pollack, 2004).

Given the information asymmetry facing potential investors as well as the incentive for VCs in particular to manage earnings in the post-IPO period before they sell out, we examine the following specific research questions. First, what is the stock price reaction when pre-IPO shareholders sell their shares at the time the lock-up expires? Second, does the stock price reaction at the time of lockup expiration predict the probability of IPO earnings management behavior? Third, and finally, what is the role of venture capitalists in managing earnings? In order to answer these questions, the rest of this paper is organized as follows. First, we briefly

explain the background of this research including the consequences of earnings management and the process of IPOs. Second, drawing on information asymmetry and agency theory, we develop testable hypotheses. Third, we utilize a sample of all U.S. IPOs during the 2001 to 2003 time period to test our hypotheses. Using event history methodology, we identify whether IPO firms show abnormal (negative) returns. We utilize Jones's modified model (1991) to measure the level of earnings management corrected for endogeneity problems. Lastly, we discuss our results and call for future research.

BACKGROUND

Earnings Management: What Is It and Why Do We Care about It?

Analysts, investors, executives, and even boards of directors largely regard earnings as the most important item in the financial reports (Degeorge, Patel, & Zeckhauser, 1999). However, it has been reported that executives often manage earnings, despite the sacrifice of outsider investors' interests (Degeorge et al., 1999). Since earnings management is an inherently unobservable process, proxies are needed to measure it. One of the most well accepted measures to test for earnings management is the investigation of abnormal accruals because accruals are easier to manipulate than cash flows (e.g., Davidson, Jiraporn, Kim, & Nemas, 2004; Teoh et al., 1998(b); Morsfield & Tan, 2006; DuCharme et al. 2001). Note that, in a typical IPO process, all information reported in the prospectus has to be audited by external accounting firms. During this procedure, the accounting firms have to verify that IPO firms comply with generally accepted accounting principles (GAAP). However, this auditing mechanism is not perfect. The GAAP for accrual accounting allows substantial discretion in recognizing the timing and amount

of revenues and expenses (Teoh et al., 1998(b)). Thus, key officers and VCs have the discretion to manage earnings.

It is also important to know that the consequences of earnings management are substantial. Costs associated with the manipulation of reported earnings include 1) litigation costs, 2) loss of reputation, 3) loss of future accounting flexibility and 4) negative long-run returns. First, according to section 11 of the 1933 Securities Act, anyone who bought a registered security can file a lawsuit if any part of the registration statement includes untrue or omitted information. In many cases, the potential costs of litigation are large enough to threaten even the existence of the new ventures (Alexander, 1991; DuCharme et al., 2001). Second, managers consider their reputations a critical factor in their career. Since most lawsuits name the officer and directors of the firm, a trial can severely damage a manager's reputation and even their job mobility. Third, earnings management may cause the loss of accounting flexibility in the future (DuCharme et al., 2001). When managers use over-valued earnings in the current period, the ability to gain increased earnings in future period tends to be reduced. As a consequence, the IPO firm will have fewer degrees of freedom in future periods. Fourth, and lastly, prior research shows that earnings management eventually causes a negative impact on a new venture (Teoh et al., 1998(a)). As more accurate information diffuses over time, investors may realize their optimism toward the venture's shares is misplaced. Therefore, greater earnings management at the time of IPO often leads to larger price corrections in the future. In fact, Teoh and his colleagues (1998(a)) found that a firm with higher levels of earnings management (e.g., abnormal accruals) tends to show severe negative long-run stock returns.

IPOs and Lockup Agreements

An IPO is a firm's first sale of shares to the public market. Other than the offering prospectus, outsider shareholders do not have any reliable sources for information about the new venture (DuCharme et al., 2001). This lack of information about the issuer forces outsider investors to rely heavily on the prospectus. Yet the prospectus typically only provides one to three years worth of financial statements (Teoh et al., 1998(b)).

The typical IPO process is illustrated as follows. When a new venture wants to grow to the next stage, the firm considers an initial public offering as a viable option. If the firm is fortunate, it might be able to find a venture capital firm which is interested in providing capital. In return, the new venture has to give a certain portion of its shares and seats on the board of directors. As the venture continues to grow with the help of VCs, it eventually may be able to hire an investment banking firm to go public with its stock. The investment bank (underwriter) provides the logistics of the offering including offer size, price and timing (Hurt, 2005). Importantly, the underwriter establishes an agreement whereby the managers, officers, employees and VCs are not allowed to sell any shares before a specific date. This is what we call "lockup agreements" and most IPO firms feature a lockup period which is typically 180 days. At the end of the lockup period, insiders are free to sell their shares. This lockup expiration is our primary interest because it offers a testing ground to investigate self-interest seeking behavior by insiders. In the next section, we explain why IPO firms are particularly susceptible to earnings management during the lockup period. In order to explain the earnings management around the lockup expiration, we rely on two theoretical perspectives: information asymmetry and the potential moral hazard problem.

Information Asymmetry and Moral Hazard

Information asymmetry. IPOs are characterized as having little publicly available information other than in their offering prospectus (DuCharme et al., 2001). Limited operating histories as a public firm leave investors significantly under-informed. This disparity can cause potentially severe information asymmetry. Given that there are few other information sources available, it is hard for investors to accurately evaluate whether disclosed information reflects the true value of a new venture (Teoh et al., 1998(b)). This situation provides a good incentive for IPO firms to manipulate, or manage, reported earnings (DuCharme et al., 2001)

To prevent this, most IPOs feature lock-up agreements that prohibit insiders from selling shares before a specified date. As such, the lockup provision can be considered a bonding mechanism (Arthurs et al., 2008). If it functions properly, it can reduce information asymmetry between insiders and outsiders. For example, if there is any negative information withheld before a new venture goes public, the negative information will be more likely to be revealed before the locked-up shares can be sold (Brau, Carter, Christophe, & Key, 2004). Therefore, lockup provisions can play a role in reducing the benefit of withholding information by insiders. However, it is important to note that once the lockup period is over, insiders are no longer bonded in the same fashion to the IPO firm. This means that lockup agreements do not eliminate information asymmetry. Insiders' shares are locked typically only for 180 days and little mandated information is disclosed during the lockup period. Given that outside investors may not fully understand the extent to which IPO firms inflate earnings, insiders subject to the lockup agreement may attempt to boost their earnings before they sell out. Since outside investors may not fully understand the extent to which IPO firms inflate earnings, high reported earnings may

artificially inflate the stock price (Teoh et al., 1998). As such, pre-IPO shareholders have great incentive to maintain high share price until the lock-up provisions expire.

Potential Moral Hazard. Research shows that managers rarely sell their shares at the time of IPOs. Instead, they show patience until the lockup expires (Aggarwal et al., 2002). When the lockup expires, insiders are free to sell their shares without restrictions. This means that their actual first chance to gain wealth is only after lockup expiration. In order to maximize their own interests, managers even strategically underprice their shares (Aggarwal et al., 2002). The logic behind this is if there is underpricing at the first day of the IPO, this will increase the demand for the stock in the near future when they are free to sell their shares. As a result, when the lockup agreement expires, managers can sell their shares at higher prices. This also implies that insiders may attempt to maximize their own wealth at the expense of outside investors.

As such, potential moral hazard around lockup expiration becomes a good explanation for why insiders want to inflate earnings. As they artificially (strategically) deflate (underprice) the price of the stock at the time of the offering, they want to inflate the firm's earnings until they are free to sell their own shares (at the lockup expiration). This paper therefore examines whether IPO firms manipulate earnings during the lockup period.

HYPOTHESIS

Flooding Market with Shares

The lockup period is a voluntary agreement between the underwriter and insiders. This lockup agreement provides a bonding mechanism that reassures outside investors. The market and outside investors can believe that pre-IPO shareholders (including the original management team and VCs) will continue to maintain their commitment to the firm for at least a few months

immediately after the IPO. This agreement prohibits insiders not only from selling their shares on the open market, but also from attempting (e.g., offering or contracting to sell) to reduce their ownership in the company without the underwriter's consent (Bartlett, 1995; Martin, 2008).

Research shows that insiders rarely sell the locked-up shares before the lockup expires. In fact, research finds that only one percent of new ventures attempt an early release before lockup expiration (Field & Hanka, 2001) and most of these releases are not economically significant (Martin, 2008). Therefore, it is reasonable to assume that insiders do not sell their shares before the lockup expiration and the end of the lockup period provides the first opportunity for insiders to sell their stocks on the market.

While there is little selling by employees, executives, or other pre-IPO shareholders before the lockup expiration, evidence shows insiders tend to sell their shares as soon as the lockup expires (Brau, Lambson, & McQueen, 2005; Brav & Gompers, 2003; Martin, 2008). On the day of the expiration of the lockup, insiders are free to sell their shares and this significantly increases the variability of the stock price. If insiders sell a large amount of shares abruptly, this will significantly lead to a drop in the price of the shares.

To better illustrate the significant drop in stock price, we take an example from an actual IPO. The Corvis Corp. is a network equipment company which raised \$1.1 billion when it went public in 2000. It was the biggest IPO ever by a start-up company that had yet to make actual revenue. However, after its 180 day lockup provision expired, 255 million shares were unlocked and 100 million shares were traded in the first six days after the lockup expiration. As a result, Corvis lost around 55 percent of its stock price, 88 percent from its peak and 67 percent below its IPO price (Knight, 2001).

As such, the expiration of lockup agreements may result in a rush of insiders trying to sell their stock to realize profit. It is logical that when fewer shares are in the markets, stock price goes up and conversely price will go down when there is great supply. When there is great supply compared to demand, the market will put significant downward pressure on the stock price. Therefore, we expect a significant price drop in IPO firms' stock when the lockup expires.

Hypothesis 1. *There will be significant negative abnormal returns after lockup provisions expire.*

Signaling Earnings Management: Abnormal Loss at the Time of Lockups Expirations

It is important to note that not all IPO insiders are in a rush to cash out at the time of lockup expiration. Insiders in good firms may want to keep their shares even if they have no selling restrictions. This is a good signal to the market. A negative abnormal return at lockup expiration can be interpreted as a negative market reaction when insiders do not provide such signals of commitment (Gompers & Lerner, 2002). From the insider's point of view, they must send a good signal to the market in order to reap the true value of a good firm because they have superior knowledge about the true value of their firms. This signaling is only effective when insiders of bad companies find it difficult to imitate without substantial costs (Brau et al., 2005). For example, research shows that a simple signal of retaining shares is not good enough to convince investors because insiders can sell overpriced shares immediately after sending the signal (Gale & Stiglitz, 1989; Leland & Pyle, 1977; Brau et al., 2005). Maintaining the same commitment even if there is no obligation is a difficult strategy for insiders in a bad firm. Since

insiders in bad firms know that their stock is overvalued and subject to rapid price decline, it is plausible that insiders in bad firms are more eager to exit their investment.

Signaling has to be communicated in two ways. Outside investors must perceive the signal as providing valuable information. From an investor's perspective, when insiders maintain their investment after expiration of the lockup, this may indicate the signal is credible and trustworthy (Brau et al., 2005; Brav & Gompers, 2003). Given that there is information asymmetry between insiders and outsiders, outside investors may need some assurance that insiders are not attempting to take advantage of them. If insiders flood the market with shares at the lockup expiration, we might infer that insiders have some retained negative information that is yet to be revealed to market. Thus, this will be a bad signal for the investors.

As such, we argue that the lockup expiration may function as a signal of earnings management of the new venture as well. If insiders seek to use the IPO as an exit mechanism to cash out, it is reasonable to expect that the insiders want to keep the stock price as high as they can. This will enhance the likelihood of earnings management. Our rationale here is twofold. First, earnings announcements provide some of the most important information for investor decision making (Degeorge et al., 1999). Further, evidence shows that investors interpret earnings naively or view earnings as a credible signal about the issuer's future. Second, research shows that managers believe that they have virtually no method to influence the market other than through managing earnings (DuCharme et al., 2001). As such, IPO firms which want to keep their stock price high may resort to inflating earnings so that they can cash out at a premium.

If insiders opportunistically manipulate earnings, outside investors may be temporarily deceived by the exaggerated performance. When insiders take advantage of their superior information (e.g., they can exclusively access the information about the new venture's future earnings prospects which is not fully available to outside investors (DuCharme et al., 2001)), this results in a moral hazard problem. More specifically, when there is only a short window before they can sell their shares (180 days), insiders have a great incentive to manipulate earnings during this period so that they can cash out their shares at a premium.

As such, we argue if an IPO firm wants to sell its shares as soon as the lockup period ends, Pre-IPO shareholders have a good incentive to maintain the stock price as high as possible through earnings management. Unless they can keep the IPO firm attractive, they will not be able to exit the firm at premium. We therefore expect a positive relationship between negative abnormal returns at the time of the lockup expiration and earnings management behavior.

Hypothesis 2. *The more an IPO suffers from negative abnormal returns at lockup expiration, the higher the level of earnings management.*

The Moderating Role of Venture Capitalists

VCs are important in IPO research because nearly one in three IPOs are VC backed over the last decade (Gompers & Lerner, 2002). VCs are generally assumed to add value to the new ventures not only through their infusion of cash, but also through management services (Jain et al., 2008; Morsfield & Tan, 2006). Despite extensive studies, little is known whether VCs actually influence financial reporting and information disclosure in public firms (Morsfield & Tan, 2006)

Venture capital backing typically involves several rounds of funding to secure resources to support technology and product development. The VC cycle (Gompers & Lerner, 2002) follows three stages: selection- nurturing and monitoring- and exit. By design, VCs must exit the new venture to provide returns to their own investors (in their VC investment funds) and this creates a short-term orientation. In order to prevent immediate exit, lockup provisions prevent VCs from selling shares for a prescribed period. In other words, the lock-up period can play a key role in tying the interests of VCs with the interests of new IPO shareholders (Morsfield & Tan, 2006). However, it should be emphasized that after the lock-up agreement expires, VCs are free to sell their shares without any restrictions. In the case of Corvis Corp., at the time of its lockup expiration, the biggest single sale was 3 million shares sold by a single VC (Optical Ventures Equity Partners). The VC completed all the transactions within one month after lockup expiration and took home \$ 49.5 million (Knight, 2001).

While some literature argues that VCs plays a beneficial role in the IPO process, several studies show that VC involvement does not always enhance IPO performance. In order for VCs to generate profits, they often encourage new ventures to go public even if the new ventures are not ready to do so (Brav & Gompers, 1997; Jain et al., 2008). Furthermore, arguments supporting the benefits of VC often assume that VCs tend not to exit immediately after the IPO. However, research shows that VCs often do cash out at the time of lockup expiration. This results in a significant decrease in the duration of post-IPO VC involvement. (Bradley, Jordan, Yi, & Roten, 2001; Jain et al., 2008). The early exit of VCs from new ventures reduces their motivation and incentives to genuinely nurture and support IPOs to overcome their liability of newness (Jain et al., 2008).

Further, research shows that VCs often have conflicts of interest with other stakeholders (Arthurs et al., 2008) because VCs tend to maintain a shorter investment horizon and do not appear to protect the longer-term interests of the new venture. In other words, VCs often exit a new venture at a premium but leave the firm less viable in the future. As such, we argue that VCs have a great incentive to maintain high-valued or over-hyped IPO stock prices until the lockup expires. Consistent with previous research, VCs' conflicts of interests with other stakeholders (Arthurs et al., 2008) may come into play when the lockup agreement expires. VCs may attempt to maximize their wealth at the time of their exit. The "pump and dump"¹ scheme may provide a good illustration of earnings management behavior at lockup expirations (Hurt, 2005). As a wealth maximizer, VCs may hype a company's stock and create an illusion of high demand, then sell their shares once the public accepts the hype and buys the stock. Since the lockup expiration is virtually the first chance for selling their shares to the market, VCs may greatly influence managers to inflate the stock price through earnings management behavior. This type of influence would not be exceptional since VCs actively engage in all sorts of activity with top management including strategic planning, providing financial and operational experts, and formulating human resource policies, serving on board of directors, monitoring managers, and raising capital (Jain et al., 2008; Morsfield & Tan, 2006). Therefore, we propose,

Hypothesis 3. *IPO firms backed by venture capitalists will show more earnings management.*

Hypothesis 4. *When venture capitalists are involved in the IPO, the negative association between abnormal returns at lock up expiration and earnings management will be particularly enhanced.*

¹ www.sec.gov/answers/pumpdump.htm

METHOD

Data and Sample

We develop a sample of IPOs that went public between 2001 and 2003. While IPO markets always experience major turmoil and there is no such thing as a “typical” IPO year (Beatty & Zajac, 1994; Arthurs et al., 2008), we selected the time frame to carefully avoid any extreme years such as the Internet bubble period. In order to prevent any distortion of the data by outliers, holding companies, foreign firms and real estate investment trust (REITs) were eliminated from the dataset resulting in a sample of 160 firms.

To identify the exact lockup expiration date, we consulted SEC (Securities and Exchange Commission) filings. As required by the amended Securities and Exchange Act of 1934, each IPO firm must file their prospectus (form 424B) at the time of IPO. We manually collected the information in this study based on the prospectus of each firm. For example, the terms of lockup is specified in the IPO prospectus under a separate heading titled “Shares Eligible for Future Sale”. This section explains that if the lockup expires, a substantial number of shares will be released to the market and it will negatively impact the IPO firm’s stock price. We then matched this information with the stock returns of the new venture from the files of the Center for Research in Security Prices (CRSP) at the University of Chicago. Similarly, accounting data were obtained via Compustat. In case a year prior to the IPO accounting data are missing, we again manually search the individual prospectus for the relevant information.

Dependent Variable

We use IPO firms' current working capital accruals to measure earnings management. Since entrepreneurial firms have more discretion over a short-term period than over long-term accruals, this study focuses on current accruals. In essence, if the accruals are unusually high as compared to industry peers (termed "discretionary"), it is considered as managing earnings (Teoh et al., 1998(b)). A variety of accounting, finance and management research has utilized this construct and has consistently shown the validity of the measure (Davidson et al., 2004; Teoh et al., 1998(b); Morsfield & Tan, 2006; DuCharme et al. 2001). Following previous literature, we also use the extension of cross-sectional Jones (1991) model to calculate current accruals.

$$CA = \Delta [\text{account receivables} + \text{inventory} + \text{other current assets}] - \Delta [\text{account payable} + \text{tax payable} + \text{other current liabilities}],$$

To measure "abnormal" accruals, we must have a "benchmark" for the accruals. It is notable that some portions of accruals are necessary in day-to-day operations while other portions of accruals are subject to managerial discretion. More specifically, we need to separate accruals into two components. The first part is "nondiscretionary current accruals" (NDCA) that is dictated not by the new venture's management but by firm and industry conditions. The other part is "discretionary current accruals" (DCA). This component is our primary focus and it can be manipulated by the insiders of the firm.

Cross sectional regression is used to calculate expected accruals. In this equation CA are regressed on the change in sales using all firms with the same two-digit SIC code as the issuer. In

order to take into account heteroskedasticity in the data, all variables are scaled by the firm's lagged total assets. The specific regression is as follows:

$$CA_{j,t} / TA_{j,t-1} = \alpha_0 (1/TA_{j,t-1}) + \alpha_1 (\Delta \text{Sales}_{j,t} / TA_{j,t-1}) + \varepsilon_{j,t},$$

Where j is the industry of estimated samples, ΔSales is the change in sales, and TA is the total assets. The expected current accruals are considered as NDCA and are calculated as follows:

$$\text{Expected } CA_{i,t} = \text{NDCA}_{i,t} = \hat{\alpha}_0 (1/TA_{j,t-1}) + \hat{\alpha}_1 [(\Delta \text{Sales}_{j,t} - \Delta \text{TR}) / TA_{j,t-1}],$$

Where $\hat{\alpha}_0$ is the estimated intercept and $\hat{\alpha}_1$ is the estimated slope for an IPO firm i in year t , and ΔTR is the change in trade receivables in year t for IPO firm i . In order to take into account possible sales manipulation, the increase in trade receivables is subtracted from the change in sales. Again, abnormal accruals are considered as discretionary accruals that are not explained by firm and industry conditions and are considered to have been “managed”. Abnormal accruals (DCA) is calculated as follows:

$$\text{Abnormal Accruals}_{i,t} = \text{DCA}_{i,t} = CA_{j,t} / TA_{j,t-1} - \text{NDCA}_{i,t},$$

Where $\text{DCA}_{i,t}$ is abnormal accruals for IPO firm i in year t . The benefit of this approach includes automatic adjustments for fluctuating industry-wide economic effects (Teoh et al., 1998(a)). DCAs are an asset-adjusted proxy for measuring earnings management.

Independent Variables

Abnormal Return (AR). We employed event study methodology to measure the abnormal returns on the lockup expiration day. Event study has been recognized as an effective methodology to detect the impact of an economic event on the value of a firm (Coff and Lee 2003; Agrawal and Kamakura, 1995; McWilliams and Siegel, 1997). We used the market model to estimate parameters (Brown & Warner, 1985). Specifically, we start with calculating abnormal returns:

$$AR_{it} = R_{it} - E(R_{it})$$

Where R_{it} is the actual return on the i^{th} firm at time t and $E(R_{it})$ is the expected return. In essence, the event study methodology attempts to capture the portion of stock price change that is caused by a specific event (Boehmer, Broussard, & Kallunki, 2002). This means it is important to eliminate the normal influence of firm or market-specific effects from the influence of the proposed event. Therefore, abnormal returns are calculated as the difference between the actual returns in the event period and expected returns in the absence of the event effects.

In the market adjusted model (Brown & Waners, 1985), the expected return of stock i at time t can be obtained by regressing company daily stock returns (R_{it}) on the CRSP value-weighted return index (R_{mt}).

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}, \text{ where } t = -80, \dots, -11$$

Where α_i is an intercept for the i^{th} stock, β_i is the market beta of the i^{th} stock, R_{mt} is the market return, and ε_{it} is an error term. The lockup expiration date is our “event day (day 0)”. We identify the lockup expiration dates based on the information in the prospectus. We used 70 days

of lockup duration days as our estimation periods (day -80 to day -11). It means that the abnormal returns at the time of lockup expirations are compared to the normal returns when the shares were still locked. If we combine equation 1 and 2, we obtain the abnormal returns:

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt}, \text{ where } t = -3, \dots, +3$$

We observe the event period for 7 days (-3 days to +3 days) around the lockup expiration. This is a short-horizon approach in order to avoid any potential confounding effects (Kothari and Warner, 2007). Research shows that long-horizon methods suffer from serious limitations (Kothari and Warner, 2007) largely because potential confounding effects will make the statistical detection harder and less reliable (Boehmer et al., 2002). In order to avoid the possibility that any confounding event can happen during the event window, we use the abnormal returns at $t=0$ (lockup expiration) for our regression analysis. Average abnormal returns for the lockup date are calculated as a simple mean of daily abnormal returns.

Venture Capital-Backing. Following previous literature (e.g., Arthurs et al., 2008; DuCharme et al., 2001; Morsfield & Tan, 2006; Field & Henka, 2001; Brau et al., 2004; Bradley et al., 2001), we use a dummy variable for venture capitalist involvement. Those firms supported by venture capitalists were coded 1 or 0 otherwise.

Control Variables

We implemented a number of control variables to rule out alternative explanations. To control for *industry differences*, we use six dummy variables based on SIC code clarification² (

² First digit of SIC code=0, 1, 2: Agricultural, Mining, 3: Manufacturing, 4: Transportation, 5: Wholesale & Retail Trade, 7: Lodging & Entertainment, and 8: Services.

McGahan & Porter, 1997). We also control for *underwriter's reputation* because of the significant role of investment banks in the IPO process. For example, analysts at the underwriting investment banking firms often have provided the most favorable earnings projections to maintain the aftermarket price from dropping below the offer price at the time of the IPO (Teoh et al., 1998(a)). We used an adjusted Carter-Manaster (1990) rank based on rankings from Jay Ritter's website³ (Longhran & Ritter, 2004). Since IPO firms are required to be audited by an external accounting firm to verify compliance with generally accepted accounting principles (GAAP), we also control for the *quality of accounting firms*. If the auditing firm is a "big 5", we coded "1" otherwise "0". We also took into account *CEO duality* because of the potential agency issues regarding information disclosure. A dummy variable was used (1=duality, 0=non-duality). We controlled for *founder effects* because founders are in general interested in retaining control and are reluctant to give away shares to VCs (Florin, 2005). We used a dummy variable to measure the persistence of the founder effect (1=founder, 0=nonfounder). To control for the maturity of the organization (e.g., the liability of newness (Singh, Tucker, & House, 1986), the natural logarithm of one plus the *firm age* was used. Given that managers are able to strategically underprice IPOs to maximize personal wealth from selling shares at the time of lockup expiration (Aggarwal et al., 2002), we control for the amount of *underpricing* at the time of the IPO. This variable is calculated as the first day closing price minus the offer price divided by the offer price (Certo, Covin, Daily, & Dalton, 2001). The offer price was obtained from the final S-1 and the first day closing price was obtained from the CRSP database. Since high quality firms may be willing to agree to having more shares locked up as

³ <http://bear.cba.ufl.edu/ritter/ipodata.htm>

well as a longer lockup period (Brav & Gompers, 2003), we also control for *lockup shares* & *lockup period*. We investigated two governance variables because higher quality governance can prevent earnings management. First, since outside board of directors on the board of IPO firms play an important monitoring role, we controlled for *outsider ratio*. Second, research shows that firms with more concentrated ownership can increase the effectiveness of governance (Hoskisson, Johnson, & Moesel, 1994) and are less likely to engage in substantial management of earnings (Amihud & Lev, 1999); we control for the *ownership concentration* by the use of the Herfindahl index. As a proxy for firm size and power, we use the natural log of the *number of employees* as a control (Lester, Certo, Dalton, Dalton, & Cannella, 2006). Since R&D ability is often a crucial factor to predict IPO performance, we also controlled for *R&D intensity* by using the total amount of R&D spending divided by the number of employees in the organization. Finally, as prospect theory (Kahneman & Tversky, 1979) suggests, the previous performance of the new venture may influence risky decision making (such as earnings management behavior). We therefore control for *returns on assets* of the firm in the year of the IPO.

Analytical Approach

It is possible that VCs are only associated with successful and credible IPOs because research shows that VCs pick only the cream of the crop (Florin, 2005). In general, sample selection bias can arise when the criteria for selecting independent variables are not independent of the dependent variables (Winship & Mare, 1992; Higgins & Gulati, 2006). Since VC backing is not randomly assigned, we need to control for potential endogeneity issues (Hamilton & Nickerson, 2003). If we were to run a regression without correction, the resultant coefficient may

produce a biased estimate due to the fact that the assignment was not random. We therefore used Heckman selection models to avoid the possibility of sample selection bias (Heckman, 1979). Heckman's model is a two-stage procedure. In the first stage, probit regression is used to estimate the likelihood of getting VC backing. An instrumental variable from this model then was included in a second-stage model as a "selection variable". The variables used in the first stage were the total number of higher educational degrees held by top management team (e.g., Ph.D. or JD), total years of industry experience, and the total number of previous industry firms worked for by top management. We use hierarchical regression analysis to test our hypotheses. The first model only contained control variables and we then add additional variables associated with abnormal returns and venture capitalists-backing.

RESULTS

Table 1 presents the mean, standard deviation and correlation among all variables used. To prevent the distortion of data by multicollinearity, we examine the variance inflation factors (VIF). We found that none of them approach the suggested threshold of 10 (Neter, Wasserman, & Kutner, 1985). The mean of the lockup period for the sample was 177 days and the minimum was 90 days and the maximum was 365.

Hypothesis 1 proposed negative abnormal returns at the time of the IPO lockup expiration. We found that IPOs show unusual negative returns the day the lockup agreement expires. We further statistically test the size of these abnormal returns. Table 2 presents the t-test for average abnormal returns on the event day along with a window of before and after 3 days. Results show that the day of lockup expirations is associated with negative returns while the rest of the days around the event show non-significant returns. Specifically, the estimation of the t-

statistic indicates that the possibility of an abnormal return of this size occurring by chance is less than 1 percent ($t=-3.56$, $p<.001$). We therefore reject the null hypothesis that the abnormal returns on the event are not significantly different from zero. We observe that other than the event day the rest of the returns surrounding the event day fluctuate randomly in a statistically nonsignificant manner. In addition, we also checked the standardized abnormal returns (SAR⁴) because it is possible that the event day returns have a greater variance than in the surrounding periods (Beaver, 1968). Even after we control for the possible event-induced heteroskedasticity (Boehmer et al., 2002), the results still show strong negative returns at the time of IPO lockup expiration ($t=-2.89$, $p<.001$). Therefore, this result provides additional evidence that the negative returns at the time of lockup expiration do not occur by chance.

Table 2 presents the results of the hierarchical regression analysis. Hypothesis 2 proposed a positive relationship between negative abnormal returns at the time of lockup expiration and the level of earnings management. After controlling for relevant variables, we found a strong negative coefficient ($\beta=-.28$, $p<.001$) (negative abnormal returns are positively related to earnings management). These results confirm that negative abnormal returns at lockup expiration are a good signal of earnings management behavior in IPOs. Thus, hypothesis 2 is supported.

Hypothesis 3 proposed the firms with VC-backing will be more likely to show earnings management due to their short-term investment horizon. We found that when VCs are involved in the IPO process, IPOs tend to show higher levels of earnings management ($\beta=.24$, $p<.05$).

⁴ The event-period abnormal returns are first standardized by the estimation period standard deviation. Then the standard deviation of these standardized SARs is calculated cross-sectionally in the event period and the significance of the estimate of the average standardized abnormal returns ASARs is tested using the cross-sectionally estimated standard deviation (Binder, 1988; Boehmer et al., 2002).

Further, in hypothesis 4, we argued for a moderating effect of VCs on the relationship between the abnormal returns and earnings management. We found a significant coefficient for this prediction in that when VCs are involved in the IPO process, the intensity of the negative relationship between abnormal returns and earnings management is increased. However, the coefficient for this interaction is only marginally significant ($\beta=.20$, $p<.10$). Therefore, hypothesis 4 is only partially supported.

TABLE 2.1
Descriptive Statistics and Correlations

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.CEO duality ^{a)}	0.5	0.5	1															
2.Founder	0.4	0.5	0.13	1														
3.ROA	-0.1	0.4	-0.02	-0.24	1													
4.VC-bcking	0.4	0.5	0.11	0.24	-0.19	1												
5.Underwriter	8.2	1.2	-0.07	-0.30	0.24	-0.16	1											
6.Underpricing	0.1	0.2	0.19	0.06	0.00	0.06	-0.01	1										
7.Outside BOD	33	17	-0.08	0.04	-0.18	0.24	-0.04	0.12	1									
8.Lockup shares	0.6	0.3	0.14	0.13	-0.14	0.16	-0.03	0.17	0.19	1								
9.Lockup period	177	51	0.19	0.13	-0.13	0.09	-0.34	0.02	0.09	0.18	1							
10.Herfindahl	1191	1474	-0.12	-0.03	0.09	-0.07	0.00	-0.21	-0.10	0.08	0.13	1						
11.DCA	-10	68	0.12	-0.12	0.14	0.05	0.22	0.00	-0.01	0.02	-0.15	0.06	1					
12.AR	-0.2	1.1	0.00	0.05	-0.20	0.12	-0.15	0.07	-0.01	0.01	0.12	-0.05	-0.27	1				
13.Firm age	19	27	0.02	-0.11	0.18	-0.08	0.10	0.05	-0.04	-0.13	-0.11	-0.12	0.02	-0.01	1			
14.Firm size	5053	19638	-0.01	-0.26	0.36	-0.18	0.40	0.01	-0.11	-0.09	-0.04	0.04	0.24	-0.13	0.20	1		
15.R&D Intensity	3.2	5.3	-0.02	0.01	-0.33	0.18	-0.02	-0.04	0.12	0.07	0.01	0.00	0.02	0.07	-0.04	-0.19	1	
16.Auditor	0.96	0.15	-0.15	-0.05	0.01	-0.03	0.08	-0.06	0.08	0.08	-0.15	-0.14	-0.11	0.03	0.12	0.02	0.02	1

Correlations of .157 or greater are significant at $p < .05$, Correlations greater than .205 are significant at $p < .01$, $n=160$

^{a)} Spearman rank correlations are shown where ordinal data is used.

TABLE 2.2
Results of Event Study Analysis for Daily Abnormal Returns

Event Day	Abnormal Return	T-Statistic	Standardized Abnormal Return	T-Statistic
-3	0.002551	0.792832	0.11247	1.227725
-2	0.004572	1.111311	0.095848	0.656361
-1	-0.00356	-1.22945	-0.13727	-1.57783
0	-0.00969	-3.56883***	-0.24587	-2.89821***
1	-0.0013	-0.54812	-0.05757	-0.82778
2	0.001008	0.287137	0.031124	0.391294
3	-0.00087	-0.28425	0.00424	0.047283

N=160. ***p<.001, **p<.01, *p<.05.

It is notable that our instrumental variable for correcting for endogeneity is non-significant ($\beta=.13$). Therefore, it seems that selection bias is not a problem. However, previous research suggests that even if the coefficient is not significant, it is preferable to keep the variable in the regression (Humphreys, Phibbs, & Moos, 1996) in order to prevent possible biased estimation. To be sure, we also ran the OLS regression without the selection variable (uncorrected model) but the coefficient is stable regardless.

Since our hypotheses assume that the negative abnormal returns may occur due to pre-IPO shareholders selling their stock, we also test the trading volume surrounding the event day of lockup expirations. If the abnormal returns are not the result of a small number of outliers or simple anticipation of price drop, there might be significant transactions at the time of the lockup expiration. We therefore, examine the trading volume surrounding the event day. Following the

measure by Field and Hanka (2001)⁵, we calculate abnormal daily trading volume by subtracting each IPO firm's daily trading volume from the mean volume of 45 days prior to the lockup expiration. This analysis reveals that there is a significant volume increase when the lockup expires and the t-statistic shows that this size of volume cannot occur by chance ($t=2.15$, $df=159$, $p<.05$).

DISCUSSION AND CONCLUSIONS

While IPOs are considered a major breakthrough event for new ventures and crucial for a nation's economic innovation and growth (Teoh, Wong, & Rao, 1998), research on the lockup period has received little attention in entrepreneurship and management literature. This study attempts to fill in this gap by investigating the negative abnormal returns at the time of lockup expiration. Drawing on information asymmetry and the potential moral hazard problem, we tested negative abnormal returns at lockup expiration and the likelihood of earnings management.

Our results suggest that on average there is a clear negative market reaction to the lockup expiration. However, not all firms experience the negative abnormal returns. Pre-IPO shareholders in good companies may not sell their shares even if the lockup expires. If the insiders do not flood the market with shares after the lockup expiration, this might be a good signal of commitment by the insiders. When insiders are not short-term oriented, there is little reason for them to engage in earnings management because this may sacrifice the long-term viability of their venture. We found that this signal of commitment indeed lead to lower levels of earnings management.

⁵ Abnormal Volume= $[V_{i,T} / (1/45 * \sum_{t=T-45}^{T-1} V_{i,t})] - 1$, where $V_{i,T}$ is the trading volume (from CRSP) from firm i on day T .

TABLE 2.3

Results of the Linear Regression Estimating the Relationship between Independent Variables and Earnings Management

Dependent Variable: Earnings Management	Model 1	Model 2	Model 3
Control Variables:¹			
CEO Duality	0.16	0.11	0.10
Founder	0.00	-0.01	0.01
Firm age	-0.02	0.01	-0.02
Underpricing	0.10	0.09	0.11
Lockup shares	0.07	0.10	0.09
Outside BOD	0.00	-0.08	-0.07
Lockup period	-0.18†	-0.08	-0.09
Selection variable	0.15	0.13	0.13
Firm size	0.22†	0.24*	0.26*
Return on assets	0.01	-0.03	-0.05
R&D Intensity	0.07	0.03	0.01
Underwriter reputation	0.06	0.06	0.04
Ownership concentration	0.09	0.07	0.09
Auditor reputation	0.00	0.11	0.10
Main Effects:			
Abnormal returns		-0.28***	-0.39***
VC-backing		0.24*	0.22*
Interaction Effects:			
VC-backing × Abnormal returns			0.20†
R²	.316	.406	.432
Adjusted R²	.170	.263	.285
F-Statistic	2.165**	2.829***	2.961***
R²	.316	.090	.025
F-Statistic for Change	2.165**	6.570**	3.810*

N=160 ***p<.001, **p<.01, *p<.05, †p<.10. Standardized coefficients reported.

¹ Controls for industry were included in all models but were omitted from the table due to space limitations.

Our results also indicate that there is a significant detrimental role played by VCs in terms of earnings management. While there has been evidence that VCs are responsible for the negative lockup effect (Field & Hanka, 2001; Sacirbey, 2001), we further extend this argument to the issue of earnings management. Contrary to the perception that VCs play a supporting and nurturing role, we found that VC-backed ventures show a greater tendency to engage in manipulation of earnings. We also found that when VCs are involved, the negative relationship between abnormal returns at lockup expiration and earnings management was higher. We argue that this is mostly because VCs maintain a short investment horizon to maximize their wealth. By design VCs have to exit the new venture (to show returns for their investment fund) and VCs are under great pressure to meet the performance target demanded by their fund investors. If VCs are concerned about realizing profits in the short-term, they may actively influence the new venture's management in a detrimental way.

The results are robust even after controlling for potential endogeneity issues. While our selection variable is not significant, the results after taking into account the possible non-random selection problem still show the same results. Further, we took one more step to test several alternative explanations for robustness and we found consistent predictions.

Research Implications and Limitations

To date, relatively little research has explored the issue of lockup expiration and little is known about its implications. For theorists, the results of our study show an interesting implication for market efficiency. We recall that lockup shares and the lockup period are well specified in the prospectus. If the market is perfectly efficient, there should be no statistically significant increase or decrease in stock price around the event. However, we found strong

evidence that on average the event day stock price shows significant negative abnormal returns. This means that the market must possess incorrect prior beliefs about how much equity will be sold at the time of lockup expiration (Gompers & Lerner, 2002). For some reason, the market was surprised by the actual number of shares that come on the market. We explain this based on two theoretical perspectives. First, it seems that significant information asymmetry still remains between insiders and outside investors. Insiders may have some retained information that is not fully disclosed to the market. Second, given the significant information asymmetry, insiders may attempt to take advantage of outside investors.

In particular, we have focused on earnings management at the time of lockup expiration. This is important because it has been reported that investors are often too overoptimistic about the earnings potential of young growth companies (Ritter, 1991). One source of this optimism may stem from the fact that issuers can report unusually high earnings (Teoh et al., 1998(b); Aharony et al., 1993; Morsfield & Tan, 2006). If insiders want to artificially boost the new venture's earnings and cash out at a premium, outside investors may have very little chance to obtain positive abnormal earnings in the near future. This temporary deception may have a negative impact on the new venture's future performance thereby reducing outside investors' wealth.

As such, our results have a special implication for outside investors. We have shown that the lockup expiration provides a possible prediction to capture insiders' opportunistic behavior. Ill-informed investors may find our results useful to detect potential misleading information during the IPO process. Fortunately, there has been a significant increase in attention to the

lockup expiration. Several websites⁶ provide ordered lists for upcoming lockup expirations. The significant increase in attention demonstrates investors' awareness of the importance of the lockup period. In line with those movements, this study provides empirical evidence to show why we should follow lockup expirations closely.

Our results also may answer the important question – what kinds of distortions are introduced when the venture capital market grows dramatically after a bubble? As Gompers & Lerner (2002) argue, this is one of the biggest questions for IPO researchers. Evidence shows that the distortions includes 1) bringing a firm to IPO even if the firm is not ready (Elstrom, 2001; Brav & Gompers, 1997; Jain et al., 2008), 2) encouraging new ventures to spend huge sums on marketing and advertising to attract media attention instead of targeting real customers (Useem, 2000; Mills, 2001; Kehoe, 2002), 3) conflicting interests with other stakeholders (Arthurs et al., 2008), 4) artificial boosts in stock price during the Internet bubble (Biddle, 2001; Buckman, 2001; Mills, 2001; Morsfield & Tan, 2006), and 5) a higher mortality rate in the long-term (Fisher & Pollack, 2004). This study further shows that VC influence may lead to higher earnings management behavior. While VCs certainly have the role of monitoring and supporting, it seems the short investment window after the IPO provides a good incentive for VCs to engage in manipulation of earnings.

It is also notable that sometimes it is impossible to expect the nurturing and supporting role of VCs due to the short duration of their involvement. For example, Blackboard went public in 2004 at \$14 a share and the stock price immediately jumped to more than \$20. In this IPO, only three weeks before the IPO prospectus was filed to the SEC, the founders of Blackboard

⁶ www.ipohome.com, www.ipolockup.com and <http://ipoportal.edgar-online.com/ipo/home.asp>.

sold a large amount of shares to a group of venture capitalists. By the time the lockup period expired, a group of VCs had more than 50 percent of the new venture's shares and up to 12.5 million shares ready to be unlocked for sale by the VCs (Knight, 2004).

The results of this study also have implications for policy makers. While the lockup provision was expected to reduce information asymmetry, it seems the lockup provision provides a good incentive for insiders to hype or manage their earnings. In other words, policy makers may hope that if there is any negative information withheld before an IPO, the retained information will be revealed after the IPO and before expiration of the lockup period (Brau, Carter, Christophe, & Key, 2004). However, this study shows that the lockup provision only extends the period of insiders' opportunistic behavior. Furthermore, insiders as wealth-maximizers may want to keep the stock price as attractive as possible so that they can cash out with a premium at lockup expiration. This will increase the probability of earnings management and cause additional problems to outside investors. Given that there is a significant chance of earnings manipulation when VCs are involved, investors may need additional monitoring safeguards. In fact, acknowledging the negative role of VCs in IPOs, the SEC⁷ (Securities and Exchange Commission) has attempted to regulate improper accounting and reporting behavior by hedge funds (and potentially for the venture capital industry as well) (Borrell, 2004; Morsfield & Tan, 2006). This study provides additional evidence to support this movement.

This study is not without its limitations. First, while we found venture capital backing significantly increased the likelihood of earnings management, we have not examined the long term performance of those firms. Although this issue was beyond our study, future research may

⁷ SEC Release No. IA-2266

address this issue. Given the often short life span of IPO firms, it may also be interesting to examine the survivability of those firms which manipulate earnings. Second, we were not able to track down the exact number of shares sold by VCs since they are not required to report this event to the SEC (Gompers & Lerner, 2002). If this issue of data availability is resolved, future studies might examine the direct association between VCs shares sold at the time of the IPO and earnings management.

In conclusion, we have attempted to explain how the lockup expiration increases potential incentive misalignment between insiders and outsider investors. This lack of alignment leads IPOs to engage in earnings management because insiders want to maximize their wealth when they are free to sell their shares. As such, potential agency costs will reduce outside investors' wealth. This study finds that negative abnormal returns at lockup expiration are an effective signal to indicate whether a firm is involved in earnings management behavior. Further we find that VCs play a significant role in earnings management. As such, the lockup expiration is an important event for future research.

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CHAPTER THREE

PAPER TWO

RESOURCE DEPENDENCE AND INSTITUTIONAL ENVIRONMENT: A CROSS-LEVEL ANALYSIS ON EMERGING MARKET MULTI-NATIONAL COMPANIES

Abstract

We identify and examine the drivers of internationalization for firms from emerging economies. We develop a multi-level theoretical model using firm- and country-level factors to systematically assess the reasons for internationalization for such firms. We find that technological and human dependence on foreign countries are positively associated with internationalization. Further, cross-level effects suggest that favorable institutional environments that provide critical resources to such firms enhance their likelihood for internationalization to overcome their dependence on foreign sources. In sum, we find that firms in emerging economies pursue internationalization to overcome both technology and human capital dependence particularly when the institutional environments are favorable in their home countries.

INTRODUCTION

According to the United Nations Conference on Trade and Development (UNCTAD), global FDI outflows amounted to \$1,997 billion as of 2006 (World Investment Report, 2007). While developed countries are still the dominant source of such outflows, there have been significant

increases in outward investment by emerging economies. Investments from these economies have reached \$304.3 billion accounting for 15.2% of the world total. This number is likely to increase since recent research has predicted that the economies of Brazil, Russia, India and China (the BRIC economies) may eclipse those of the United States, Japan, Germany, the U.K., France, and Italy (G6) by 2050 (Wilson & Purushothaman, 2003). Accordingly, the growth and activity of transition economies is becoming more important within the world economy (Panitchpakdi, 2006).

Given the increasing globalization of emerging economies, domestic companies in these markets have adopted increasingly outward-oriented postures. These companies are unique from other MNEs (from developed economies) in that they have experienced recent economic transformation processes within their home markets and face distinctly different institutional obstacles. As such, their international activities may differ substantially from other MNEs. These firms are the main interest of this study. We investigate a distinct group of emerging market firms, namely Emerging Market Multinationals (EMNCs) that went far beyond their peer firms' efforts in term of internationalization (Aybar & Thirunavukkarasu, 2005). More specifically, we seek to identify the drivers of internationalization among these firms.

In spite of the important role of firms from emerging economies, theoretical and empirical explanations of such actions remain insufficiently analyzed (Yiu et al., 2007; Mathews, 2006). It is notable that researchers have often taken established theories from developed economies and parochially applied them with little regard to the respective context of the emerging economy (Bruton et al., 2008). This is unfortunate as prior literature has highlighted the fact that firms in emerging economies are constrained by a variety of country specific factors

(Makino et al., 2002; Yiu et al., 2007). These economies often face serious impediments such as deficient institutional features (e.g., lacking skilled labor, and infrastructure problems) as well as political and economic instability (Hoskisson et al., 2000). Because extant research on internationalization tends to focus on MNEs in developed market economies such as the US, Europe and Japan (Luo, 2003), what remains unclear are the factors which affect internationalization activities among firms in emerging economies.

Additionally, it has often been recommended that research should not stop at country level effects in examining international entrepreneurship in emerging economies (Bruton et al., 2008). While country level effects are important, the interaction between country and firm level effects is often overlooked. Furthermore, cross level analysis seems to provide potential research insights not currently addressed in top international management scholarship (Werner, 2002). Since organizations may not be free from external forces, unilevel analysis cannot capture the true nature and complexity of internationalization.

There are two issues associated with a unilevel research approach that we find relevant in the context of our research question on the drivers of internationalization. First, concentrating on only one level of analysis implicitly assumes that most of the heterogeneity is located at the chosen level, whereas alternate levels of analysis are considered more or less homogeneous (Rothaermel & Hess, 2007, Gupta et al. 2007). For example, studies drawing upon only firm-level heterogeneity assume that significant variation occurs at the firm level of analysis, whereas country level institutional factors are more or less homogeneous. Second, when focusing on one level of analysis, researchers implicitly assume that the focal level of analysis is more or less independent from interactions with other levels of analysis (Klein et al. 1994). For example,

firm-level heterogeneity (e.g. variance in technological and human capital within firms across countries) is assumed to be relatively independent from the institutional environment that affects firms operating in different contexts. The assumptions of homogeneity in, and independence from, alternate levels of analysis are serious concerns that could lead to spurious empirical findings (Rothaermel & Hess, 2007). With this in mind, we develop a multilevel theoretical model to address these threats by accounting for potential heterogeneity in and across firm and country levels when explaining the drivers of internationalization. More specifically, we believe that a multilevel approach will help us better understand how the drivers of internationalization at one level of analysis are linked to those at another level, and in so doing, provide a richer and more complete perspective of this complex, multidimensional process (Klein et al. 1994, Rousseau 1985).

In sum, we argue that there has been an absence of research using a multi-level perspective and there has been an associated absence of research examining internationalization activities among companies residing in emerging markets. Drawing on resource dependence theory, this study attempts to address the above issues by answering the following research questions:

- 1) Why do firms from emerging and developing economies (EMNCs) go international?
- 2) Does resource dependence affect the internationalization activities of EMNCs?
- 3) How does the respective institutional environment affect these firms?
- 4) Are there any interactions between the respective country level institutional environment and firm level resource dependence?

In order to answer these questions, the rest of the paper is organized as follows. First, the study begins with a literature review of internationalization. Second, we develop hypotheses based on three different levels of analysis: 1) firm level drivers, 2) country level drivers, and 3) cross level effects between firm and country level drivers. Third, based on World Bank data on 26,859 firms from 27 countries (The World Bank Group, 2005), we empirically test our model. Finally, we discuss the results and limitations of our study and suggest managerial implications and directions for future research.

INTERNATIONALIZATION FROM EMERGING ECONOMIES

One of the most fundamental questions distinguishing international from domestic business research is why companies expand operations beyond their home-country borders. To answer this question, an extensive literature from international business has emerged (Tallman & Yip, 2001). The modern theory of internationalization was developed by Hymer (1976) and Kindelberger (1969) in their oligopoly power models (Tallman, 1992). Their approach focused on the market structure of competitiveness as the primary determinant of internationalization. Several variants of the oligopoly power model subsequently appeared in the literature, including “follow the leader” (Knickerbocker, 1973), “exchange of hostages” (Graham, 1974), and “international life cycle theory” (Vernon, 1971). Oligopolistic models suggest that a firm will select a host country in order to deter competitors’ entry or to block their positions (Kogut, 1988). Later, Dunning’s (1980; 1995) eclectic paradigm combined three elements including ownership-specific advantages (O), location-specific advantages (L) and internalization advantages (I) to create an integrated approach to the previously fragmented theory of

internationalization. The OLI paradigm has been widely supported particularly in mature markets (e.g. Dunning, 1980; Morck & Yeung, 1991; Yiu et al., 2007).

Nevertheless, the assumption that firms seek to maintain market power or must possess ownership advantages in order to operate in a foreign country can be theoretically challenged when we consider firms from emerging economies. EMNCs are different from firms from mature economies because of their different resource endowments (Wells, 1983; Yiu et al. 2007). Lall (1983) found that EMNCs can sometimes outcompete competitors from developed economies when entering other emerging markets owing to lower-cost inputs and technology and management that are better adapted to the host country conditions. However, these firms hardly possess market power and operate in a “resource constrained context” (Ramamurti, 2004: 280) leading to firm specific disadvantages. To cope with these disadvantages, firms from emerging economies are often heavily dependent on foreign countries in terms of their technology, human capital, and so forth.

While the OLI and market power paradigms may have limitations for explaining internationalization among EMNCs, institutional theory provides a basis to understand how the respective context may differ and how this may impact internationalization activities among firms in emerging economies (Peng, 2003; Peng et al., 2008; Wright et al., 2005). The country level institutional environment in emerging economies has been characterized as “missing institutional features” (Hoskisson et al., 2000). For example, shortage of skilled labor, thin capital markets, poor infrastructure, and political and economic instability are typical in emerging markets (Hoskisson, 2000). The lack of well defined property rights and an impotent

legal framework have induced high levels of opportunism, bribery, and corruption in these contexts as well (Nelson et al., 1998).

While scholars have suggested that there is a growing need for research that addresses issues concerning internationalization of firms based in emerging economies (Wright et al., 2005; Ramamurti, 2004), there has been very little research that has done so. As Peng and colleagues (2008: 931) recently admitted, “we currently know very little about how firms from emerging economies internationalize.” They further argued that “if the field aspires to remain globally relevant, it seems imperative that more research be devoted to these crucial strategic issues”(Peng et al., 2008: 931). This study responds to this call. More specifically, we will probe how resource dependence to foreign countries and “missing institutions” may drive firms in emerging economies to expand internationally. In the next section, we draw on resource dependence theory and institutional theory to explain these drives at the firm and country level.

INTERNATIONALIZATION: MICRO VERSUS MACRO PERSPECTIVES

When answering the question of why firms decide to take the risk of going international, two conceptual viewpoints appear to dominate. The first viewpoint, which we refer to as the micro perspective argues that individual firms possess certain characteristics that act as a primary driving force behind internationalization. For example, Yiu and colleagues (2007) have asserted that multinational enterprises (MNEs) may have certain proprietary resources allowing them to generate monopolistic or competitive advantage over indigenous firms thereby offsetting their liability of foreignness. This viewpoint is consistent with Dunning’s (1980) perspective which specifies that firm level ownership advantages can lead to internationalization. However, as noted earlier, this would hardly be the case for firms from emerging markets when we consider

their insufficient resource endowment. Instead, we point to the problem of resource dependence issues facing EMNCs and the concomitant firm specific weaknesses as a stronger rationale for why they pursue internationalization. More specifically, we believe that EMNCs may be driven to pursue greater internationalization as they become increasingly dependent on external sources for critical resources such as knowledgeable human capital and technology.

The second viewpoint which we refer to as the macro perspective argues that the context motivates MNEs to pursue internationalization. Under this viewpoint, scholars have reasoned that elements outside the firm may motivate it to engage in internationalization (e.g., Dunning 1980, 1995; Hoskisson et al., 2000; Wright et al., 2005; Peng et al., 2008). While most research in this vein looks at the difficulties that MNEs face as they seek to enter a country with an unfavorable institutional environment, we examine the impact that the home country institutional environment has on EMNCs. More specifically, we believe that a favorable home country institutional environment may abet internationalization activities among EMNCs.

Combining these two viewpoints, we propose a cross-level perspective which we believe provides a more complete rationale for why EMNCs internationalize. The main argument here is that while environmental pressure cannot wholly determine internationalization decisions, organizations are nonetheless influenced by their home country environment (Ingram & Clay, 2000). In a similar vein, researchers have questioned the inseparability of the “ownership advantage” from the “location advantage” in Dunning (1980)’s eclectic paradigm (Rugman & D’Cruz, 2000; Itaki, 1991). For example, Itaki (1991: 453) argued that “ownership advantage” cannot be separated from the “location advantage” because whether an ownership advantage

(e.g., a specific technology) turns out to be profitable is subject to the combination of firms' input coefficients and a country's input prices.

Examining these three perspectives, we categorize the determinants of internationalization into two separate levels of analysis: firm- (micro), and country- (macro). Moreover, in line with arguments made by Rugman and Verbeke (1992), this study also explores the possibility of an interrelation between firm specific elements and country specific elements affecting EMNCs internationalization activities. In the next section, we explain firms' internationalization based on these multi-level analytical arguments.

THEORETICAL DEVELOPMENT AND HYPOTHESES

There is wide variety of actions that can be considered as international venturing. Typically, firms tend to move into foreign markets as exporters and/or as foreign investors (e.g., expanding foreign operations) (Reynolds, 1997; Lu & Beamish, 2001). Exporting and foreign direct investment (FDI) are common strategies used in MNEs. Here we use these two actions to conceptualize internationalization.

Because we are examining internationalization of EMNCs, we give attention to those elements which have proven important to these organizations in prior literature. For this reason we focus on the extant human capital and technology possessed and utilized by these EMNCs (Yiu et al., 2007; Lall & Siddharthan, 1982; Clegg, 1987; Lau & Ngo, 2004). Technological capabilities are fundamental for gaining competitive advantage and firms prefer to reduce dependence on foreign sources for technology (Dunning, 1993; Hennart & Park, 1993; Hymer, 1976; Yiu et al., 2007). Similarly, human capital is also critical for generating rents and firms

prefer ownership of such inimitable resource rather than depending on foreign sources (Rosenbloom, 2000; Lall and Siddharthan, 1982). In the next section, we develop hypotheses based on these two types of resources. Specifically, we draw on resource dependence theory to explain how firm level dependence on foreign countries motivates firms to go international.

Resource Dependence to Foreign Countries: A Firm-level Driver

The roots of resource dependence theory can be traced back to the seminal work by Emerson in 1962 where he argued that social dependence by one party on another is influenced by the availability of alternative goals outside the relationship with the other party. Thompson (1967) moved the focus to organizations and suggested that organizational dependence is determined by an organization's need for resources and the availability of other resource providers. Pfeffer & Slancik (1978) further codified the theory by articulating the fact that organizations engage in exchange with their environment in order to survive. The underlying assumptions of resource dependence theory are twofold. First, not all required resources are available internally. Strategic and critical resources are not self-sufficient thereby leading to dependence on other firms (Heidi, 1994; Paulraj & Chen, 2007). Second, unlike environmental determinism (e.g., ecological theory-Hannan & Freeman, 1977), resource dependence theory assumes that organizations can alter their structure and patterns of behavior to acquire needed resources from their environment and thus manage their dependence (Ulich & Barney, 1984). If these assumptions hold, organizations are expected to take a number of actions to avoid

dependence because by doing so, they can manage the organization rationally and protect the technical core⁸.

Pfeffer & Salancik (1978: 52) further introduced the notion of “countervailing power.” This notion explains that the power or resources in one part tends to set up forces that result in a countervailing, concentrated opposition. Thus, when there is dependence it is expected that an organization may attempt to enact control over the needed resources so that it can minimize its dependence on other organizations. A common solution as a countervailing action is to buffer the organization against possible instability such as developing sufficient inventories. However, in the case of intangible assets, such inventories are almost impossible due to the fact that valuable resources are accumulated over time (Dierickx & Cool, 1989) and they develop into subsequent intangible capabilities. If buffering inputs does not remove the basic source of vulnerability, the most effective strategy for dealing with dependence is to change the organizational structure itself so that the organization no longer requires the resources (Pfeffer & Salancik, 1978).

As such, we argue that internationalization is a firm’s strategic choice to minimize external threats. Pfeffer & Salancik (1978) suggested that diversification is a radical form of reducing dependence. The effectiveness of this strategy is enhanced to the extent that the geographical diversification can provide the needed resources. Accordingly, we view this geographical diversification (internationalization) as being a coping strategy utilized by EMNCs when they are faced with resource dependence issues surrounding their intangible resources such as human capital and technological resources.

⁸ We use the term technical core in the way that Thompson (1969) does. In this sense, technology is defined as action dictated by beliefs toward a desired outcome. Core technology involves the way a firm organizes and the types of routines it uses in the production of its product/service and can also include the actual technology developed in the organization. Organizations naturally prefer to shield the technical core from the dictates of the environment.

If a focal firm is highly dependent upon a foreign firm for an important resource, such as technology or human capital, the foreign firm will have power over the focal organization (Pfeffer & Salancik, 1978). The focal firm will be motivated to undertake international expansion for the ownership of such critical resources in order to minimize the threat of dependence on this foreign source. In this sense, the EMNC may seek internationalization as a means to reduce dependence on any single market and thereby reduce its dependence on the foreign supplier of technology in that market.

In a similar way, we argue that human capital also can be viewed as an important resource which may create resource dependence problems. For example, Porter (1990) suggested that the global dispersion of a firm's value chain leads to increased opportunities to enhance its efficiency by utilizing foreign workers. He further argues that human capital is one of the most important factors of inputs. If we acknowledge the importance of human capital, it is possible that a firm may undertake international expansion in an attempt to neutralize dependence in any single market. Again, organizations seek to avoid being controlled; they seek stability and certainty in their own resource exchanges. Indeed, it is usually in the interests of all participants to stabilize the organization. Thus we propose,

Hypothesis 1a. *A firm's technology dependence on foreign countries is positively associated with its propensity to expand internationally.*

Hypothesis 1b. *A firm's human capital dependence on foreign countries is positively associated with its propensity to expand internationally.*

Institutional Environments for Intangible Resources: A Country-level Driver

Several scholars have suggested that the societal institutional environment can impact activities in firms (e.g., DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Scott, 1995). Since

an organization is embedded in the social and cultural frameworks of its environment, the crucial decisions in an organization cannot be free from the institutional influences. As suggested by North (1990: 4), institutions are perfect analogues to the “rules of the game” in a competitive team sport. Institutions reduce uncertainty by providing a structure to everyday life and they are a guide to all interactions in the society.

As such, the specific context of emerging economies is an important dimension in understanding internationalization activities (Yiu et al., 2007; Wright et al., 2005). Examining the impact of institutional environments can provide explanations about the level of entrepreneurial activities (Baumol, 1990; Sobel, 2008). Given that actors pursue their interests by making choices within environmental constraints (Ingram & Clay, 2000), a theory of internationalization has to take into account the contextual influences.

However, prior research has been criticized for largely ignoring the institutional underpinnings that provide the context for firm behaviors (Kogut, 2003). According to Peng and colleagues (2008), prior research has viewed institutions as “background.” They further argued that this is normal given that most IB research has been studied in the context of developed countries (e.g., the United States, the EU and Japan) where the institutional environments are characterized as stable and market friendly. However, once IB research moves toward international contexts, it is not difficult to find that different countries possess substantially different institutional environments.

Therefore this study particularly addresses the internationalization from emerging countries whose institutional contexts differ significantly from those in developed countries (Peng et al., 2008). In line with the assertion by Ronald Coase, Nobel economist, we believe

country level institutions have a substantial impact on a firm's strategic actions. According to him, "the costs of exchange depend on the institutions of a country: its legal system, its political system, its social system, its educational system, its culture, and so on. In effect it is the institutions that govern the performance of an economy...." (Coase, 1998: 73).

Again, we want to emphasize that emerging economies have been characterized by their lack of available resources and institutional shortcomings (Hoskisson et al., 2000). These problems may hinder entrepreneurial activity. In addition, many emerging countries such as China, Hungary and Russia and so on are currently developing the "missing institutional features" (Hoskisson et al., 2000) from scratch as they transition from centralized government control to a capitalistic system. Under these resource constraints and institutional difficulties, entrepreneurs will have much greater difficulty finding and using resources which are potentially critical for international venturing. However, for those emerging economies whose institutional systems have changed to accommodate the transition to a market economy, EMNCs will find it easier to grow both within and beyond their borders.

From the institutional theory perspective (Kostova, 1997; Trevino et al., 2008; Bowen & De Clercq, 2008), going international is a matter of structure of differential advantage (Thornton, 1999). If a system's participants perceive internationalization is as an opportunity, the actors are more likely to engaging in international venturing. Therefore, the tendency of international venturing is dependent upon the structural context of a society in which actors can take advantage of the situation. For example, when such as a firm is supported by a favorable institutional environment for human capital which provides globally competitive skilled workforce, conditions will be particularly suitable for venturing in the international markets. Likewise, favorable institutional

environment for technological capital provides tangible and intangible resources and capabilities through its technological support system. It exposes domestic firms and other constituents to the cutting edge research and technology. Such favorable environment also provides world-class scientists, researchers, engineers and technocrats whose capabilities remain unique and valuable worldwide. As such, we argue that there will be differences among EMNCs in their internationalization activity based on how favorable their home country institutional environment is towards capitalistic activity.

Therefore, we propose a direct effect of country level institutional environments on firm internationalization and hypothesize the following:

Hypothesis 2a. *A favorable institutional environment for technology development in an emerging economy is positively associated with the internationalization of that emerging economy's firms.*

Hypothesis 2b. *A favorable institutional environment for human capital management in an emerging economy is positively associated with the internationalization of that emerging economy's firms.*

Cross level Interactions between Firm- and Country- level Drivers

The institutional framework of a given country includes the set of political, social, and legal ground rules that provide a basis for production, exchange, and distribution. An interaction between institutions and organizations shapes economic activities because institutions provide the rules of the game in which organizations act and compete. Organizational existence, the nature of organizations, their strategies and their evolution are all influenced by the associated institutional framework (North, 1990: 5).

Drawing on an organization-environment interaction point of view, we argue that institutions provide strong contextual forces that may moderate (constrain/reinforce) firm behaviors. Since organizations are embedded in the political, legal and social frameworks of

their environment, organizational decisions and strategies are influenced by the institutional context (North, 1990; Yiu et al., 2007; Wright et al., 2005). As Rugman and Verbeke (1992) asserted, the international configuration of EMNCs fundamentally depends not only upon their stock of “firm-specific” characteristics but also on their use of “country-specific” characteristics.

Though internationalization helps EMNCs in limiting the dependence on foreign resources, internationalization inherently involves subsequent risks and uncertainties which is reflected in the “liabilities of foreignness” (Hymer, 1976). EMNCs may opt for internationalization to overcome resource dependence issues, however; most of them lack the ability to successfully operate in advanced countries (Wan, 2005). EMNCs are even more deficient if the institutional environment at home is not supportive. In the absence of adequate support by the institutions at home, EMNCs may encounter difficulties during international market entry, and may not survive the pressures of internationalization (Luo & Tung, 2007). In sum, institutional support from the home country is critical for a firm’s success in its internationalization (Porter, 1990; Wan, 2005).

When EMNCs are provided adequate institutional support at home, they gain unique and valuable resources such as human and technological capital, which help them to compete in the global arena. Indeed, Luo & Tung (2007) argue that MNEs need to tie their internationalization efforts with their home country expertise in order to offset their liability of foreignness.

For example, Samsung in the 1980s invested heavily in R&D activities in Silicon Valley firms to gain ownership of important technologies for the future. This activity helped Samsung to overcome technological dependence on firms from the US, Japan and Germany (e.g., GE, Mitsubishi and Siemens) over the past two decades. The favorable institutional environments in

Korea, both for technological and human resources, provided subsequent support for Samsung to internalize the needed critical resources and further pursue international activity.

Government policy can also play an important role. The efforts of EMNCs seeking to catch up to and overcome foreign competitors can be greatly enhanced when governments foster a favorable institutional environment. For example, in 1999, the Chinese government initiated its “Go Global” policy and urged high performing Chinese firms to invest abroad to further enhance their competitiveness (Luo & Tung, 2007). While these kinds of initiatives are sometimes distorted for political reasons such as legitimization of the current political status quo (Morck et al., 2008), government policies can provide subsequent incentives for EMNCs that include such things as the favorable provision of low-interest loans to buy foreign companies. For example the global expansion of Daewoo (a business group in Korea) was greatly facilitated by the Korean government’s intentional investment in institutional factors particularly related to developing the auto industry. This heavy investment by the Korean government in factors such as the education system and the development of skilled labor was a critical driver accelerating the rate of Daewoo’s international expansion. As research shows, government officials and corporate executives can share the same perspective and view internationalization as a strategic choice, a phenomenon of co-evolution (Lewin et al., 1999; Luo & Tung, 2007). Therefore, we argue that the effect of firm-level actions to overcome foreign dependence on critical resources may be particularly enhanced by a favorable home-country institutional environment. Together, these factors would seem to increase the level of internationalization.

Hypothesis 3a. *The positive relationship between a firm’s technology dependence and internationalization is enhanced when the home country has a favorable institutional environment for technology development.*

Hypothesis 3b. *The positive relationship between a firm's human capital dependence and internationalization is enhanced when the home country has a favorable institutional environment for human capital management.*

METHODS

Sample

In order to test our predictions regarding internationalization by local firms within their cultural, national, and organizational contexts, we assembled a multilevel data set at both the firm- and country-levels of analysis. All firm level data for the present study came from the Investment Climate Surveys (ICS) from the World Bank Group (World Bank Group, 2005). This survey captures business perceptions on the biggest obstacles to enterprise growth, the relative importance of various constraints to increasing employment and productivity, and the effects of a country's investment climate on its national competitiveness. Private contractors conducted the survey on behalf of the World Bank. To ensure the confidentiality of the data, they used private contractors rather than a government agency to collect the data. The survey was completed by key informants in the respective organization such as managing directors or human resource managers. The core survey consists of two parts. The first part asks managers' opinions on the main constraints in the business environment. The second part focuses on productivity measures and is often conducted with help from the chief accountant. For the structure of the survey, a stratified random sampling methodology was used. To calculate adequate sample sizes, the survey considers estimates of population proportions at the industry level and estimates of the mean of log sales at the industry level. Within each country, sample size for the survey ranges from 250-1500 firms. Since the distribution of firms in most countries is overwhelmingly

populated by small and medium enterprises, surveys generally over-sample large establishments⁹.

From the ICS sample, relevant data were available for the 27 countries that are found in the GLOBE cultural study (House et al., 2004) of national variables. Sixty-eight percent of the firms in our final sample of 26,859 firms are from manufacturing industries, while twenty-five percent are from service industries, with the remainder distributed among agriculture, construction management, and other industries. The median age of the firms in our sample was 15 years at the time of ICS data collection. The list of the countries in our sample includes Albania, Bolivia, Brazil, China, Ecuador, Egypt, Arab Rep., El Salvador, Germany (E), Greece, Guatemala, Hungary, India, Indonesia, Ireland, Kazakhstan, Korea, Morocco, Philippines, Poland, Portugal, Russian Federation, Slovenia, South Africa, Spain, Thailand, Turkey and Zambia.

Dependent Variables

Exporting and foreign direct investment (FDI) are common strategies used in MNEs. Following previous literatures (Reynolds, 1997; Lu & Beamish; 2001), we considered both exporting activities and foreign investment activities to measure *the degree of internationalization (DOI)*. Exporting activities were measured via export intensity, the amount of export sales divided by total sales revenue. This value ranges from 0 to 1 (100%). In an attempt to rule out the possibility of simple exporting, we also consider foreign direct investment. Foreign direct investment was measured by asking “whether the firm has direct holding or operations in other countries” and the response was coded as no=0, yes=1. Our final

⁹ More detailed information on the ICS is available from the World Bank Group (www.worldbank.org)

dependent variable is the sum of these two variables. The variables were derived from the ICS survey.

Independent Variables

Firm-level variables (Level-1). In order to test our firm-level arguments, we used data from the ICS survey measuring 1) *Technology dependence (DOTECH)*, and 2) *Human capital dependence (DOHUMAN)*. First, *technology dependence* is by two variables including use of foreign technology (whether the firm uses technology licensed from a foreign-owned company (0= no, 1=yes)) and how much the enterprise did actually spend for the license and royalties for three years before the survey was conducted. This variable was transformed logarithmically before the analysis. Second, *human capital dependence* is measured by the percentage of a firm's permanent skilled workers which are foreign nationals.

Country-level variables (Level-2). The country level *institutional environment for technology (TECH)* was measured by the following four subsets. Firstly, patent to residents was calculated by the number of patents that a country possesses in 2004 divided by the population of residents. Secondly, loyalty and license fees per capita were calculated by the amount of receipts of loyalty and license fees divided by the population of residents. Thirdly, country level research and development (R&D) intensity was calculated as the percentage of R&D expenditure to GDP (Gross domestic product) in 2003. Lastly, researcher intensity was calculated by the number of researchers in R&D divided by the population of residents in 2003. We added the four variables without any weights. Data are publicly available in the World Development Indicators (2005) via the World Bank Group.

Country *institutional environment for human capital (HUMAN)* was measured by adding up the following three items including 1) percentage of firms offering training, 2) temporary worker intensity (average number of seasonal/ temporary workers divided by average number of permanent workers), and 3) constraints of labor regulations (percentage of firms identifying labor regulations as a major constraint of doing business). The sign of the last two variables were reversed before summing. We obtained this data via the Enterprise Survey by the World Bank Group.

Control Variables. To avoid possible alternative explanations, we have included control variables from the ICS survey. Starting with firm level variables (Level 1), we controlled for the *number of employees (SIZE)* because larger operations lead to economies of scale and scope, learning curve effects, increased market power, and other benefits (Tallman & Yip, 2001). We also control for the effect of *firm age (AGE)* because a firm may require time to accumulate adequate resource and knowledge before internationalizing its operations. As suggested by upper echelons theory (Finklestein & Hambrick, 1992), a decision maker's past experience may be an important predictor of internationalization (Perlmutter, 1969). Therefore, we control for the total years of *foreign experience of the top manager (TMTFOR)* prior to managing the focal firm. A number of authors have suggested that a firm goes international to leverage its monopolistic power (Calvet, 1981) and proprietary advantage leading to its ability to out-compete local competitors (Hymer, 1976), and to capture remaining rents in different countries (Veron, 1971). Therefore, we control for *the share of the national market (MS)* within the firm's main product line. Finally, drawing from the argument of "mutual forbearance" (Edward, 1955), we control for *the number of foreign competitors (COMPET)* the firms faced in their local market because

going international is a preemption of the growth of local competitors (Hennart, 2001). Finally, typical *industry effects (IND)* were eliminated by using of dummy variables (manufacturing vs. services).

We also control for country level variables. Given that national culture represents the normative components of institutions (Parboteeah et al., 2008), we include two cultural values. First, research shows that the process in internationalization involves unanticipated change and risk (e.g., Shane, 1994); therefore we control for the cultural value of *uncertainty avoidance (UNCER)*. Second, we also control for the cultural value of *performance orientation (PERFO)* because it has been argued that internationalization is positively associated with firm performance (Contractor et al., 2003). To measure these variables, we use the score form the GLOBE (Global Leadership and Organizational Behavior Effectiveness) study by House et al., (2004). Note that this measure is particularly appropriate when researchers conduct organization and country level analysis (e.g., 27 countries in our level 2 sample). As the GLOBE project stresses, “the scales are most immediately useful to cross-cultural rather than intracultural researchers” (House et al., 2004: 146). We also control for *GDP per capita (GDP)* (Gross domestic product in U.S. dollars) because low GDP is a country-level disadvantage that limits the national technology infrastructure and market capacity for the development of country-based advantage (Pianta, 1995). The values for GDP were obtained from the United Nations Human Development Report (2002) and transformed logarithmically before the analysis.

We borrowed our measure of country-level social institutions from those commonly used in the political economy and sociology literatures. To rule out the possibility that high levels of education can enhance both the technological and human capital environment at the country

level, we control for a country's educational level. Our *education (EDU)* variable is measured as educational attainment from the United Nations Development Program (c.f., Cullen et al., 2004). The educational attainment is computed as two-thirds of the adult literacy rate plus one-third of the mean year of schooling. For *governance quality (GOVERN)*, we used an aggregate measure of indicators from Kaufmann (2005). Based on the aggregation of numerous institutions¹⁰, this index captures a country's political stability, government effectiveness, regulatory quality, rule of law, and control of corruption. To adjust for differences in the metrics of component indicators, we standardized all composite measures for national culture and the institutional variables.

Analysis Technique: Hierarchical Linear Modeling.

In this paper, we provide a multi-level analysis detailing how country-specific advantages interact with firm-specific advantages. This nested level of analysis induces the problem concerning independence of observations. Individual firms are nested in institutional and cultural boundaries. Because of the non-independence of hierarchical data, simple OLS (ordinary least squares) regression methods cannot handle this kind of data. As indicated by other researchers (c.f., Martin et al., 2007; Hofmann, 1997), the level 2 (country level) variables tend to be deflated within an OLS framework. Thus, we employed a multi-level modeling technique. The HLM (Hierarchical Linear Model) (Raudenbush & Bryk, 2002) approach has been accepted as a valid technique to examine multi-level analyses because it can take into account the nested, nonindependent nature of the data by partitioning and estimating

¹⁰ Including World Bank (the Governance Indicators), World Economic Forum (the Executive Opinion Survey), Transparency International (Corruption Perception Index), and Freedom House (political and civil liberties and freedom of the press)

simultaneously within and between groups (Raudenbush & Bryk, 2002). Underlying the logic of HLM is that two models for the estimations of country level parameters (Level 2) and firm level parameters (Level 1) are computed simultaneously: one modeling relationships within each of the lower level units, and a second modeling how these relationships within units vary between units (Hofmann, 1997). This approach can explicitly model both individual and group level residuals and, therefore, we can take into account the partial interdependence of individuals within the same group. Drawing on this multi-level methodological lens, we test the hypotheses based on the following procedures. First, we ran a null model with no predictors. If there no significant variance explained in the null models between groups, the assumptions of OLS regression are not violated and therefore HLM is unnecessary. Second, we added level 1 variable to test the significance of firm level variables (DOTECH and DOHUMAN). Third, we then added level 2 variables to see the effect of the country institutional environment (TECH and HUMAN) on firm internationalization. To partial out the level 1 effects, the level 1 variables stay in the model as control variables. Third and finally, we tested the cross level interaction by testing “an-intercepts-and-slopes–as- outcomes” model (Raudenbush & Bryk, 2002).

RESULTS

Table 1 provides a matrix of correlations and sample statistics of the variables used in this study. It should be noted that correlations at the individual level do not take into account the nested nature of the data (e.g., nonindependence) and therefore the results should be interpreted with caution. To test for the presence of multicollinearity, we examined the VIFs (Variation Inflation Factors) and none of them are more than 5.67. These VIFs are well below the

commonly accepted threshold of 10 (Neter et al., 1985). This suggests multicollinearity is not a significant problem.

TABLE 3.1
Descriptive Statistics and Correlations

Level 1	Mean	S.D.	1	2	3	4	5	6	7	8	9
1.SIZE	217	1202	1								
2.MS	8.14	20.2	0.24	1							
3.AGE	19.4	16.6	0.28	0.15	1						
4.IND	1.26	0.44	-0.27	-0.24	-0.17	1					
5.TMT FOR	2.11	2.64	0.08	0.01	-0.02	0.00	1				
6.COMPET	17.0	370	0.01	-0.01	-0.02	0.03	1.00	1			
7.DOTECH	0.01	1.00	0.15	0.13	0.06	-0.10	0.10	-0.01	1		
8.DOHUMAN	0.01	0.07	0.01	0.05	0.01	-0.04	0.04	0.00	0.01	1	
9.DOI	0.18	0.34	0.34	0.01	0.04	-0.18	0.14	0.00	0.09	0.01	1

Correlations of .013 or greater are significant at $p < .05$, Correlations greater than .022 are significant at $p < .01$

Level 2	Mean	S.D.	1	2	3	4	5	6	7
1.UNCER	3.86	0.52	1						
2.PERFO	4.01	0.40	0.74	1					
3.GOVERN	0.18	0.69	0.20	-0.09	1				
4.EDU	0.85	0.13	-0.07	-0.27	0.41	1			
5.GDP	6765	9252.47	0.19	-0.08	0.87	0.48	1		
6.TECH	0.14	1.01	0.34	0.20	0.53	0.34	0.62	1	
7.HUMAN	0.52	0.17	-0.06	-0.19	-0.14	0.37	0.02	0.17	1

Correlations of .01 or greater are significant at $p < .05$, Correlations greater than .03 are significant at $p < .01$, Level 1: $n = 2, 6859$, Level 2: $n=27$

Before examining a more complex level model, in HLM, a fully unconditional model (no predictors are specified at either level 1 or 2) can show whether this model is relevant to a multilevel model. More specifically, the HLM gives us the intraclass coefficient (ICC) which indicates the existence of significant variation among countries. To do so, we conducted an ANOVA with random effects. The results of the ICC values and the associated Chi square statistic show that the subsequent amount of variance in the degree of internationalization resided at a higher level ($\chi^2=2560, 62, d.f.=26, p<0.001$). Thus, it is concluded that this model is appropriate for a multilevel analysis and, as such, we proceeded with the complex model.

Table 2 shows the results for the HLM analysis for the relationship between level 1 and 2 variables and internationalization. To test the impact of the dependence of technology and human capital, we employed the “random-coefficients regression model” (Raudenbush & Bryk, 2002). The level-1 slopes (DOTECH and DOHUMAN) were entered (which did not exist in the one-way ANOVA). This model is similar to OLS regression analysis, but in this model the slopes are conceived as varying randomly over the population of country level variables. The results of Model 1 show that the test of the null hypothesis (dependence of technology is not related to firm internationalization within countries) is not supported. In other words, technology dependence is positively associated with internationalization when controlling for relevant level 1 variables thereby supporting hypothesis 1a ($\beta=0.04, p<0.05$). Similarly, we also found a positive coefficient for human capital dependence ($\beta=0.07, p<0.05$). Thus, hypothesis 1b is also supported.

TABLE 3.2
Results for HLM Analysis for the Relationship between Independent Variables and Internationalization

Variables	Model 1 (Level 1)			Model 2 (Level 2)			Model 3 (Cross level)		
	b		s.e.	b		s.e.	b		s.e.
Firm level									
<i>Control variables</i>									
SIZE	0.22	***	0.02	0.22	***	0.02	0.22	***	0.02
MS	-0.02		0.03	-0.01		0.03	-0.01		0.03
AGE	-0.08	***	0.02	-0.08	***	0.02	-0.08	***	0.02
IND	-0.08	†	0.04	-0.08		0.05	-0.08		0.05
TMTFOR	0.02	***	0.00	0.02	***	0.00	0.02	***	0.00
COMPET	0.00	**	0.00	-0.00	*	0.00	0.00		0.00
<i>Independent variables</i>									
DOTECH	0.04	*	0.02	0.04	†	0.03	0.07	**	0.03
DOHUMAN	0.07	*	0.03	0.08	*	0.03	0.07	*	0.03
Country level									
<i>Control variables</i>									
UNCER				-0.07	***	0.02	-0.07		0.02
PERFO				0.04	†	0.03	0.04		0.02
EDU				0.01		0.02	0.01	*	0.03
GOVERN				0.08	†	0.04	0.08		0.05
GDP per capita ^{a)}				0.03		0.06	0.03	*	0.06
<i>Independent variables</i>									
TECH				-0.01		0.03	0.02		0.04
HUMAN				0.04		0.02	0.02		0.02
Cross level									
DOTECH×TECH							0.14	***	0.03
DOHUMAN×HUMAN							0.02	*	0.01

^{a)} GDP per capita was log transformed prior to analysis

Level 1: n = 2, 6859, Level 2: n = 27

†p < .10, * p < .05, ** p < .01, *** p < .001

Model 2 shows the country level effects. In this analysis, we used the “means-as-outcomes model” (Raudenbush & Bryk, 2002). In this analysis, the internationalization is predicted by two country level variables (TECH and HUMAN). We hypothesized a positive relationship between the country level technological environment and internationalization but the results are not significant ($\beta=-0.01$). Therefore hypothesis 2a was not supported. We also were not able to find a significant relationship between a country’s human capital environment and internationalization ($\beta=0.04$) after controlling for all level 1 and 2 alternative explanations.

Finally, we tested the cross level interaction based on the “intercepts-and-slopes-as-outcomes” model (Raudenbush & Bryk, 2002). Having estimated the variability of the country level predictors, we accounted for this variability. This model seeks to explain why some countries have a stronger relationship between dependence and internationalization. In hypothesis 3a, we posit that the positive relationship between a firm’s technology dependence and internationalization will be particularly enhanced when the home country has a favorable institutional environment for technology. The results of Model 3 show that the interaction effects between firm level technology dependence and the country level technological environment is significant ($\beta=0.14$, $p<0.001$). Thus, hypothesis 3a was supported. To better depict the relationship, we plot the relationship between a technology dependence and internationalization at low (below the average) and high (above the average) degree of a society’s institutional environment for technology (Figure 1). As we expected, when a society has a favorable institutional environment for technology, the slope of the relationship between global technology capabilities and internationalization is particularly enhanced.

In hypothesis 3b, we posited that the positive relationship between a firm's human capital dependence and internationalization will be particularly enhanced when the home country has a favorable institutional environment for human capital. Results show a positive cross-level moderating effect ($\beta=0.02$, $p<0.05$). The interaction plot also confirms that the positive relationship between a firm's human capital dependence and internationalization was strongest when there was a favorable institutional environment for human capital.

DISCUSSION

During past two decades, EMNCs have emerged as major players in the global economy. We meld the insights from resource dependence and institutional theory to address a theoretical gap in the literature with regard to the drivers of internationalization for these EMNCs. Specifically, we applied a multi-level perspective using firm and country level factors to systematically identify and assess the reasons for internationalization for the firms from emerging economies. Moreover, we examined cross level effects by investigating the combined influence of firm- and country-level drivers on internationalization. We developed our framework drawing upon the World Bank's Investment Climate Surveys (ICS) which also corresponds to the GLOBE study of national cultural values making our findings more generalizable in the context of the global economy.

FIGURE 3.1
Cross-Level Moderating Effects of the Institutional Environment of Human Capital on the Relationship between Human Capital Dependence and Internationalization

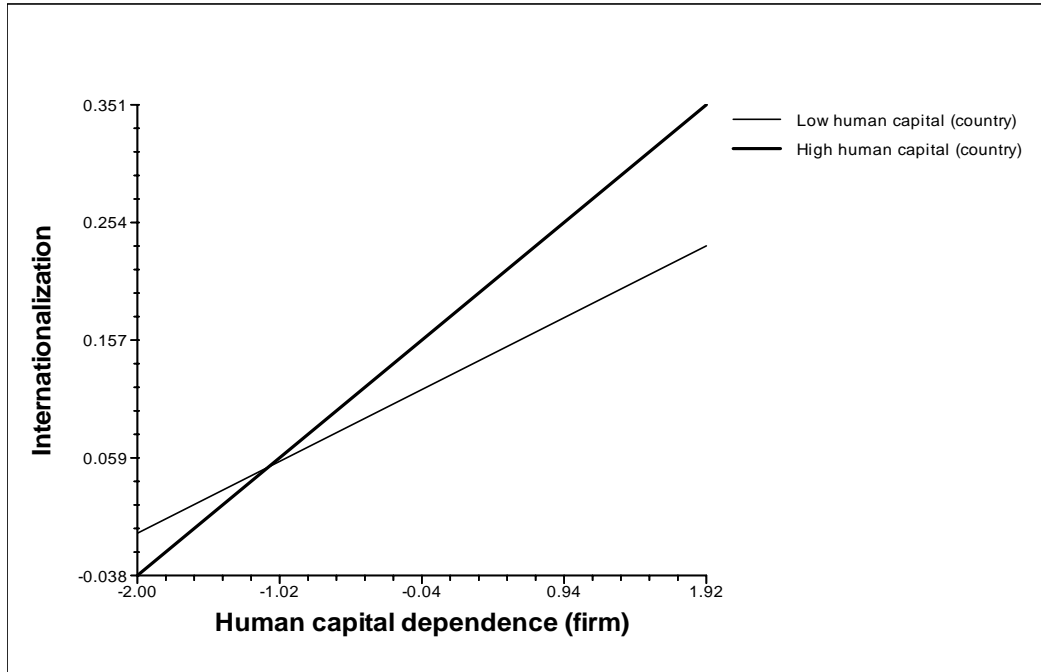
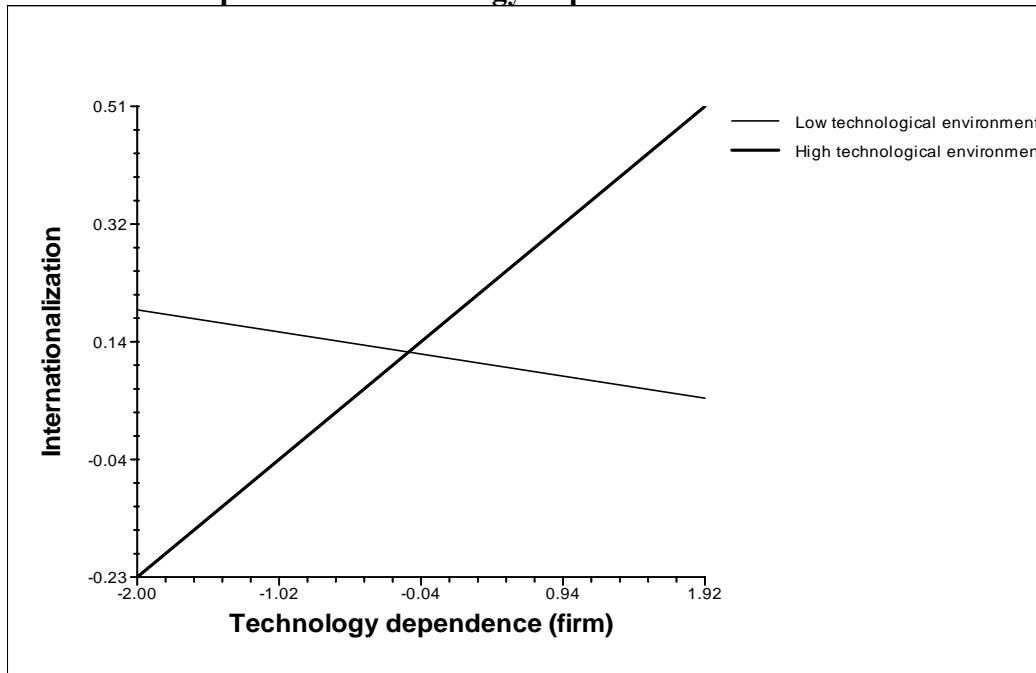


FIGURE 3.2
Cross-Level Moderating Effects of the Institutional Environment of Technology on the Relationship between Technology Dependence and Internationalization



Our results suggest that technological and human dependence on foreign countries is positively associated with internationalization. We argued that technological and human resources are critical resources for an EMNC and such firms may diversify internationally to acquire these resources from the ‘source’ itself. They prefer geographic diversification over dependence on foreign firms for such critical resources. Alternatively, firms from emerging economies could enter into contracts with foreign firms for the supply of technological resources; however, such contracts give foreign firms considerable leverage over the EMNCs in repeat bargaining and future negotiations (Pfeffer and Salancik, 1978, Williamson, 1975). Moreover, greater international presence facilitates the acquisition and utilization of technological and human resources. Technological resources and human capital contribute to the development of tacit knowledge, routines and capabilities that are relatively difficult to transfer, imitate and substitute. As such geographic diversification also helps EMNCs in mitigating the asymmetric balance of power that is tilted in the favor of firms from developed foreign countries because of the presence of superior resources. In sum, EMNCs minimize potential resource dependence threats by diversifying geographically.

However, we were not able to find any significant relationship between a favorable institutional environment in an emerging economy and internationalization of its firms. It is plausible that merely providing a favorable institutional environments is not enough; rather it is the combination of firm specific strategies with institutional factors that creates a ‘fit’ within the global economy, and in turn, leads to internationalization in a substantial way. Our cross-level analysis provides further evidence for this argument. Using HLM, we considered a more

complex model by exploring how a combination of firm level resources and economy-specific factors influences the internationalization of firms from emerging economies. We found that a favorable institutional environment for developing critical resources at home in an emerging economy greatly accelerates a firm's internationalization. This, in turn, helps EMNC to overcome its dependence on foreign 'sources' for the critical resources. Our results suggest that EMNCs may not be able to go international to overcome their resource dependence issues unless they have institutional support at home to counter their "liability of foreignness." We find that EMNC's strategic choice of internationalization to overcome both technology and human capital dependence is particularly enhanced when their home countries provide a favorable institutional environment.

IMPLICATIONS AND EXTENSIONS

We contribute to the literature by highlighting the joint effect of country and firm level factors on internationalization. This study addresses numerous calls by scholars for addressing a gap in the international business literature by taking both micro- and cross-level international issues into consideration concomitantly (Bruton et al., 2008, Werner, 2002). Because a consensus is emerging among scholars that internationalization is a complex, multidimensional phenomenon that could be better explained by drawing upon diverse theories across different levels (Chi and McGuire, 1996; Oviatt and McDougall, 2005, Werner, 2002), we examined the motivation for internationalization for firms from emerging economies by drawing upon multiple theories and employing a cross-level analysis. We found that insights from institutional theory and resource dependence theory provide a sound theoretical rationale for explaining internationalization.

Our analysis and results have implications for both policy makers as well as managers. We believe that the development of a favorable institutional environment for the human capital and technological resources creates value and promotes the health of domestic firms especially in the ECs. Since a favorable institutional environment facilitates the internationalization process, it is important for EC policy makers to develop an institutional environment in ways that open up opportunities for EC firms to become part of the global economy and reap the associated benefits. In essence, this implies creating frameworks that enable the development of resources domestically and minimize transaction costs. A constructive interaction between institutions and firms promotes economic efficiency and international growth because institutions define the way the game is played and firms develop strategies for sustainable worldwide growth. Moreover, a favorable institutional environment in combination with efficient firms will contribute to the development of valuable resources that may greatly enhance EMNCs efforts toward reducing dependence on foreign countries.

However, it is notable that fostering a favorable institution does not always encourage firms' internationalization (outward FDI). In emerging economies, a balance between inward FDI and outward FDI is particularly important. In any case, it is useful to develop human capital and technological resources by providing a favorable institutional environment because this helps in overcoming liabilities of foreignness for EMNCS and attracting foreign investors. This explains why emerging economies that have been successful in attracting inward FDI (e.g., China and India in Asia, Brazil and Chile in Latin America) have been able to quickly increase their outward FDI (Luo & Tung, 2007).

Our results showing that the development of a favorable institutional environment for human capital and technological resources promotes internationalization of EC firms who want to reduce foreign dependence is consistent with the emergence of EMNCs from countries with enabling institutions that have developed frameworks for developing factor markets as a basis for production, exchange and distribution. For example, a breakdown of the Fortune 500 companies (comprehensive for 2003 through 2008) by country highlights that EMNCs are generally developing in the countries that are *relatively superior* to other ECs in terms of human and technological resources, and provide a relatively favorable institutional environment (e.g., China, India, Brazil, Mexico and Russia)¹¹. In essence, our cross-level study demonstrates that both the firm level and country level factors collectively influence the internationalization process.

Though we used a cross level approach, our analysis did not include variables at the meso-level (e.g. industry level). Future research might fruitfully explore how industry level factors influence the process of internationalization. For instance, environmental dynamism and munificence might motivate firms in certain industries to search for international opportunities. Industry contextual variables such as competitive intensity and capital intensity may also influence internationalization.

A systemic longitudinal analysis at the firm, industry and country level could bring new insights on the internationalization process the development of national indices. Future research exploring how firms' heterogeneity, industry differences and variation in country institutional environments may influence the emergence of EMNCs and the internationalization process would be valuable. Studies exploring how managerial attributes such as discretion, the industry

¹¹ These countries are included in our sample.

environment and institutional variables may influence different modes of internationalization (e.g. international joint ventures, greenfields) would add value to the literature. Relatively little work has been done on the performance implications of human and technological resources and capabilities in the context of internationalization. Future efforts considering how these resources and capabilities, in conjunction with the industry environment and country institutional environment, influence overall national performance (e.g. GNP, GDP, and other national productivity measures) would be valuable as well. Future research can build upon the foundation provided by our research using cross-level approaches for identifying and analyzing reasons for internationalization and related phenomenon.

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CHAPTER FOUR

PAPER THREE

CULTURAL AMBIVALENCE AND FIRM INNOVATION: A MULTI-LEVEL ANALYSIS

Abstract

It has often been assumed that national cultures have strong and unequivocal characteristics. However, research has shown that the simple notion of unequivocal cultural dimensions is not satisfactory to explain the true nature of culture. This study attempts to fill this gap by introducing the notion of ‘cultural ambivalence’ to explain firm innovation. We believe that each society has multiple and ambivalent concepts of culture so that researchers can distinguish between practices (‘as is’ - meaning the way things are) and values (‘should be’ - meaning the way things should be). Drawing from psychology, sociology, and management theories, we tested cross-level hypotheses regarding firm innovation. Data for 27,509 firms from 28 countries were analyzed using Hierarchical Linear Modeling (HLM). Results show that “as-is” cultural values are strong predictors for firm level innovation. Furthermore, this study provides empirical evidence that the state of cultural ambivalence could be a source of change in a society. Given the negative impact of uncertainty avoidance and collectivism, we found that the level of innovation may increase when people desire to reduce their “should- be” scores compared to the “as is” scores of culture. On the other hand, innovation may increase when people desire more

performance orientation in their society as compared to current practice. Implications for practice and future research are discussed.

INTRODUCTION

Innovation has been identified as a critical source of competitive advantage and long-term survival among organizations (Porter, 1990; Amabile, 1988; Ancona & Caldwell, 1987; Kanter, 1988; Woodman, Sawyer, & Griffin, 1993; Edquist, 1997). Acknowledging the importance of innovation for competitive advantage, much research has attempted to identify the antecedents that either facilitate or inhibit innovation. At the national level, perhaps culture has provided one of the most common explanations for differences in innovation activity. Not surprisingly, over the last three decades, many comparative management studies have extended our understanding of innovation via responses to country-specific cultural values (eg., Tiessen, 1997; Shane et al, 1995; Shane, 1995; Westwood & Low, 2003).

Previous literature has specifically linked some dimensions of cultures to innovation. Oftentimes, complexities within these cultural studies are reduced by simplification (Fang, 2006), and they assume at least implicitly that a nation's culture can be stereotyped as strong and monolithic.. In this view, culture is internally consistent because the dimensions are coherent and convergent rather than conflicting. (Nakata, 2003; Yaprak, 2008). Despite this simplification, however, research has shown that the unequivocal notion of culture is not always satisfactory to explain its true nature (Hajda, 1968; Merton, 1976; Saffold, 1988; McLoughlin et al., 2005). Many studies have demonstrated that people's mixed emotions, or ambivalence, are salient in the national context (Kunda, 1992; Gabriel, 1999). As asserted by Hajda (1968: 21), a given social

system is closer to a “paradoxical, Janus-like system” so that the members of society have to deal with inherent antimony or bipolarity or symbiosis of two opposing forces. There have been many examples for this kind of mixed perceptions and attitudes. For example, it has been reported that individuals in Japan think that new Japanese people “should be liberal but morally conservative, individualist but harmony-oriented, and globalist but still nationalist” (Dobson & Hook, 2003: 208). In a similar vein, Hagen (1994) found that Norwegian viewers of a television news program experienced ambivalence when their news viewing differed from what they expected of imagined ideal viewers.

As such, we argue that any country may have multiple, ambivalent cultural orientations. Specifically, we challenge the assumptions of unequivocal culture by articulating the ambivalence between practice (‘as is’- meaning the way things are) and value (‘should be’- meaning the way things should be) based culture. It is notable that research has regarded the values based cultures and the practice based cultures as identical because values can drive practice. Using an “Onion Diagram”, Hofstede (2001: 11) argues that values are an invisible part of culture and can be manifested via cultural practices. Therefore, knowing values in a culture tells us about what exactly happens. Accordingly, if the onion assumption is correct, we should expect positive correlations between the practice based culture and values based culture. It should be noted, however, in a recent study of cultures (GLOBE¹²), seven out of nine cultural dimensions provide significant “negative (not positive)” association between practice based culture and values based culture (Javidan, House, Dorfman, & de Luque, 2006). We believe this

¹² GLOBE (House et al., 2004) – Global leadership and organizational behavior effectiveness research program.

result provides additional evidence that cultural values are not unequivocal. Accordingly, we explore the impact of culture on firm innovation based on the distinction between practice based culture and values based culture. We identify this distinction as the manifestation of cultural ambivalence. Since innovation is closely related with change from the *status quo*, we further argue that the difference between practice (reality) and ideal (aspiration) could be an important basis for motivating new actions.

To explore the above issues, we investigate the following research questions. First, why does innovation vary across countries? Does country level culture explain firm level innovation differences? Second, how can we understand variations in intra-cultural values within a national culture? Does practice based culture and values based culture show the same prediction on firm innovation? Third, does cultural ambivalence impact innovation, and if so, how does it?

In order to answer these questions, we more fully develop the concept of cultural ambivalence from other disciplines such as sociology and psychology and then test the research questions using measures developed by the GLOBE study (House, Hanges, Javidan, Dorfman, & Gupta, 2004) concerning country culture. Using a large, multi-level, cross-country dataset, we employ appropriate statistical tests. In the literature of cultural studies, a number of researchers have argued that uni-level analyses are inappropriate because the unit of analysis for country-level variables (e.g., culture) and organization-level variables (e.g., firm innovation) are different (Cullen, Parboteeah, & Hoegl, 2004). Since firm specific variance can offset cultural influences and vice versa, we need to model the nested nature of the variables when explaining the drivers of innovation. We therefore develop multi-level and cross-country arguments to address the above shortcomings.

The rest of this paper is organized as follows. First, we define innovation and introduce the concept of cultural ambivalence. Second, we develop testable hypotheses regarding the impact of cultural values and cultural ambivalence on firm innovation. Third, we detail the methodology for testing the hypotheses based on the sample of secondary data on 27,509 firms from 28 countries (World Bank, 2005). Lastly, we discuss the results and draw conclusions. Managerial implications and directions for future research are also suggested.

INNOVATION DEFINED

Innovation has often been defined in a narrow sense and restricted to technical innovations (Edquist, 1997). Although this is acceptable, the concept of innovation can transcend just technical innovations. Schumpeter, for example, believed that innovation should be conceived in a much broader way. He states the following concerning innovation:

“...Production in the economic sense is nothing but combining productive services, I may express the same thing by saying that innovation combines factors in a new way, or that it consists in carrying out New Combinations” (Schumpeter, 1939: 87-8).

According to Schumpeter, “doing things differently” and the “carrying out of new combinations” are essential characteristics of innovation. In addition to the idea of a “new combination,” Nelson & Rosenberg (1993) establish the distinction between product innovation and process innovation. They interpret 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 & Rosenberg, 1993: 4-5). They define innovation as not only the first introduction of a technology but also its diffusion and utilization. They elaborate the difference between their concept of

innovation and Schumpeter's by noting that "the strictly Schumpeterian innovator, the first firm to bring a new product to market, is frequently not the firm that ultimately captures most of the economic rents associated with the innovation" (Nelson & Rosenberg, 1993: 4). Similarly, Carlsson (1995) suggests that process innovation is as equally important as product innovation.

In this paper, we adopt this broader meaning for innovation. Specifically, we use innovation including technological, product, and process innovation. Given that we consider cross-national differences, allowing many dimensions of innovation is appropriate to the nature of the current study. In the following section, to advance understanding of the national culture as evolving from the country-level context and pressing upon local firms, we briefly summarized previous literatures that explain the relationship between national cultures and innovation.

NATIONAL CULTURES AND INNOVATION

Adler (2002) argues that the cultural orientation of a society not only reflects, but also affects values, attitudes, and behaviors of its members. National culture can affect several things such as individual's behavior choice, leadership behavior (House et al., 2004), managerial values (Smith, 1992), and executive decision making (Tse, Lee, Vertinsky, & Wehrung, 1988). Particularly, it is notable that national culture can affect firm level innovation because a nation's culture can influence the psychological characteristics of individuals within the population so as to create a larger supply of innovation (Davidson & Wiklund, 1997; Hayton, George, & Zahra, 2002).

Several studies have examined the relationship between cultural values and innovation activities, proposing that certain cultural profiles lead to greater innovation activity (e.g., Couto & Vieira, 2004; Nakata & Sivakumar, 1996; Shane 1992, 1993). While some variations may

exist in terms of sample, method, and level of analysis, in general, it has been reported that uncertainty avoidance, performance orientation and collectivism can influence innovation (Hofstede, 1980; Wong, Everett, & Nicholson, 2008; Jones & Davis, 2000; Shane et al., 1995; House et al., 2004; Trompenaars & Hampden-Turner, 1998; Tiessen, 1997; Shane & Venkatraman, 1996).

While this previous literature examining the influence of culture on innovation has added valuable insights, researchers have pointed out at least three major limitations of these previous work. First, while firms are nested within a nation, little research has actually addressed the embeddedness issue. Unless we control for firm specific factors, the results are not robust. Second, the literature on firm innovation across nations mainly has focused on comparing the inputs of innovation such as research and development spending (Tellis, Prabhu, & Chandy, 2009). However, inputs do not always guarantee the creation of innovation (Acs & Adretsch, 1987; Tellis et al., 2009). Lastly, and most importantly, current research on innovation often strongly assumes that each country exhibits monolithic and unequivocal cultural dimensions. From this point of view, cultural values in a society are internally consistent because the dimensions are coherent and convergent rather than conflicting (Nakata, 2003; Yaprak, 2008). However, the reality of any social system is far from this simplification. Members in a society have to deal with mixed and ambivalent feeling every day (Hajda, 1968). It is natural that people in any country may have multiple and ambivalent cultural orientations. As such, we further examine the impact of cultural ambivalence on innovation.

In sum, this study attempts to test the relationship between innovation and cultural orientations based on actual innovation initiatives undertaken within a multi-level framework.

Acknowledging the recent findings of the GLOBE study allows us to examine two types of cultural values for each society. We will explain and define cultural ambivalence in the next section.

CULTURAL AMBIVALENCE

Culture has been broadly defined as: “pattern, explicit and implicit, of and for behavior acquired and transmitted by symbols, constituting the distinctive achievements of human groups” (Kroeber & Kluckhoh, 1952: 13). According to Hofstede (1980: 21) national culture is “the collective programming of the mind which distinguishes the member of one human group from another.” He further argued that the relationship between culture, values, and practices can be visualized as an “Onion Diagram” (Hofstede, 2001: 11). He regarded values as the invisible part of culture manifested through cultural practices. Thus, it is assumed that knowing values in a culture tells us about what actually happens because values drive practice. Concurring with this concept, researchers have generally accepted a values-based framework for measuring culture (Javidan, House, Dorfman, & de Luque, 2006).

However, some have argued that the ‘onion assumption’ is too simplistic to be helpful (Javidan et al., 2006). In fact, the GLOBE study distinguished cultural values (‘should be’- the way things should be) from practices (‘as is’- the way things are). Whereas the dimension of cultural practice tells us something about the current perceptions of each culture, that of cultural values taps the respondents’ feelings about their cultural aspirations and the direction the respondents want their culture to develop in the future (Javidan, Stahl, Brodbeck, & Wilderom, 2005).

Interestingly, the results of the GLOBE study show that many cultural values for ‘value’ and ‘practice’ are not positively correlated. For example, for seven of the nine dimensions the correlation coefficients between the scores on the ‘as-is’ and the ‘should-be’ answers reveal a significant negative relationship instead of a positive relationship (House et al., 2004; Hofstede, 2006). This result shows that cultural values are not unequivocal and there might be some added variance explained by separating the cultural dimension. Accordingly, in this paper, we explore a society’s culture based on its “as-is” and “should-be” values. This distinction between “as-is” values and “should-be” values is what we identify as the manifestation of cultural ambivalence.

Although ambivalence may be underexplored in management research, it has a rich history in other disciplines. In general, previous literature has identified three different types of ambivalence: psychological, sociological, and cultural ambivalence. First, psychological ambivalence has been used to explicate the characteristics of schizophrenia. It refers to an internal experience of mixed emotions such as simultaneous experiences of pleasant and unpleasant feelings (Bleuler, 1950). Some psychologists refer to it as internal conflict (e.g., Emmons and King, 1988), where a subject may “want to do it and not want to do it at the same time.” Second, sociological ambivalence focuses on how external forces, such as the existing social structure, can be sources of mixed feelings. In particular, many sociologists argue that a person’s behavior in a social system can be best understood as the expression of multiple social roles (Otnes et al., 1997). Lastly, cultural ambivalence refers to “contradictory cultural values held by members of society” (Merton, 1976: 10). Whereas sociological ambivalence is conceptualized as resulting from conflicting social roles and norms, the notion of cultural ambivalence differentiates itself by focusing on conflicts between cultural values (Hajda, 1968;

Otnes et al., 1997). Because we are interested in national cultures, we use cultural ambivalence as our primary target of analysis. Cultural ambivalence here is defined as the simultaneous presence of contradictory tendencies regarding cultural values. However, assuming similar functional relations at different levels, i.e., isomorphism (Rousseau, 1985), we argue that the relationships between ambivalence and innovation at both the individual and nation level are similar. In other words, the functional role played by ambivalence in enhancing innovation should be the same at the different levels. In the following section, we first develop hypotheses for the relationship between cultural values and firm innovation, and then propose the relationship between cultural ambivalence and innovation based on the isomorphism argument.

HYPOTHESES DEVELOPMENT

Uncertainty Avoidance

Uncertainty avoidance is the extent to which members of an organization or society strive to avoid uncertainty by relying on established social norms, rituals, and bureaucratic practices (House et al., 2004). People in high uncertainty avoidance cultures actively seek to decrease the probability of unpredictable future events that could adversely affect the operation of an organization or society (Parboteeah & Parboteeah, 2005). Individuals in low uncertainty avoiding countries exhibit a higher level of tolerance for change and ambiguity, and accept and often embrace the risks associated with an uncertain future (Jones & Davis, 2000). Innovation inherently involves unanticipated changes and uncertainty (Shane et al., 1995; House et al., 2004). Without the trial of deviance from existing norms, creative ideas cannot be generated. Typically, characteristics associated with weaker uncertainty avoidance are expected to be positively related to innovative capabilities because of the tolerance for behaviors and opinions

which differ (Herbig & Dunphy, 1998). In contrast, characteristics associated with strong uncertainty avoidance, such as the need for consensus and formal rules and procedures, are believed to inhibit innovation (Jones & Davis, 2000). In a society exhibiting high levels of uncertainty avoidance, people have a formalized view of norms and are uncomfortable violating them (Schneider, 1989; Shane, 1995; Haire et al., 1966; Sirota & Greenwood, 1971). To be innovative, firms should be willing to take risks, should be tolerant of ambiguity, and should be curious about new opportunities. As such, firms operating in low uncertainty avoiding countries will employ people with greater tolerance for uncertainty, and thus are likely to be more innovative.

Hypothesis 1a (b). *As-is (should-be) cultural values of uncertainty avoidance are negatively associated with firm-level innovation.*

Performance Orientation

In previous culture research, performance orientation has been contrasted with an ascription-directed culture (Trompenaars & Hampden-Turner, 1998). Rather than being ascribed based on location in social networks or by inherited statuses, achievement-oriented societies value the outcome of efforts. Successful goal accomplishment becomes the primary measure of personal value in high achievement cultures (Cullen et al., 2004). Research shows that the more achievement values dominate a culture, the higher the priority for outcomes will be.

Furthermore, there will be less concern for the means by which these outcomes are achieved (Cullen et al, 2004). Research shows that high performance oriented societies are less likely to maintain traditions because the societal attitude emphasizes actions and results (Joy & Kolb,

2009). Achievement values are therefore more likely to encourage the rule-breaking mindset of ‘it’s not how you play the game; it’s whether you win or lose’ (Messner, & Rosenfeld, 2001; 63).

This cultural orientation also promotes purposefulness and task-oriented efforts. To achieve goals, individuals need to be purposeful, which may keep motivating them until they achieve their goals. Also, rather than relying on inherited statuses and relationships with others, individuals with higher performance orientation pay more attention to task accomplishment. This purposefulness and task-oriented effort may boost perseverance, and high levels of perseverance are essential to overcome any obstacles in the innovation process and to ultimately succeed (Amabile, 1988). Thus, firms in a high performance-orientated country will employ people with a stronger performance orientation and are likely to be more innovative.

Hypothesis 2a (b). *As-is (should-be) cultural values of performance orientation will be positively associated with firm-level innovation.*

Collectivism

Research has shown that collectivist cultures emphasize the notion that self is defined as an interdependent member of an “in-group” (Tiessen, 1997). Collectivistic cultures therefore express more conformity and less innovation because members cannot ignore normative restrictions. Since the group is so important in a collectivist society, firms in such a society are likely to take a risk to undertake innovative initiatives (e.g., new technology) only when other firms decide that such innovation is a good idea (Parboteeah & Parboteeah, 2005). Shane & Venkatraman’s (1996) work on innovation also reveals that “rational” innovation champion strategies are preferred in collectivistic cultures compared to “renegade” innovation champion strategies.

In contrast, individualistic cultures, where people look after their own interests rather than collective interests (Hofstede, 1980), may be positively associated with innovation by encouraging nonconformity, which should help innovators to generate new ideas. Also, freedom and autonomy promoted by individualistic cultures may boost intrinsic motivation that is essential for creative endeavors (Amabile, 1988). Indeed, Shane (1992) found a significant and positive relationship between the level of individualism and world patents and trademarks. These arguments imply that the development of new ideas requires disassociation from a formal corporate structure that would prevent innovation (Tiessen, 1997). Reward systems are also important. To be innovative, people need to have the confidence that they will be rewarded for doing more than others. While people in individualistic societies believe that their achievement will be compensated by financial gain, in collectivistic societies, this kind of reward is regarded as socially less acceptable (Hofstede, 1980; Shane, 1992). Thus, we propose:

Hypothesis 3a (b). *As-is (should-be) cultural values of in-group collectivism will be negatively associated with firm level innovation.*

Cultural Ambivalence and Innovation

Innovation is closely related with being different and is associated with change from the status quo. Research shows that fostering ambivalence and reframing one's understanding of the status quo can enable individuals to generate new possibilities (Piderit, 2000). Research on organizational change shows that divergent opinions in organizations are necessary to make wise decisions and to change effectively. In order to generate divergent opinions, organizations sometimes encourage and plan for dissent and ritualize disagreement (Cohen & Staw, 1998; Piderit, 2000). Fong (2006) also found that when people experience ambivalence they tend to be

better at recognizing unusual relationships among concepts thereby enhancing creativity. Holding the opposite or antithetical thoughts in mind simultaneously increases the probability that these opposing thoughts will be integrated into new creative output (Rothenberg, 1990). Mood congruency theory (Blaney, 1986) also suggests that ambivalent emotions are better than single emotions in increasing both cognitive variability and creativity because simultaneously experiencing opposite emotions may serve to activate a great number of memory nodes.

In this study, we particularly highlight the relevance of the dualistic nature of the GLOBE dimensions. We recall that, in the GLOBE study, each dimension of a society is explained in terms of both its practice-based culture (“as is” scores) and its values-based culture (“should be” score). Practice based culture provides us information about the current perceptions of each culture while values based culture tells us about the society’s cultural aspirations and the direction that the respondents want their culture to develop in the future (Javidan et al., 2005). This means that the values based cultural dimensions can be used to estimate cultural vision and the desire for change in the culture. Therefore ambivalence scores reveal discrepancies between where a culture is and where it aspires to be.

According to Hofstede (2006), people tend to criticize their society from an ideological point of view. Respondents tend to contrast the desired (“should be”) from the actual (“as is”) state of culture. GLOBE research also points out that if a society show low practice scores for a desirable cultural dimensions, the society tend to report high value scores (Javidan et al., 2006). This also suggests people may behave not because they hold particular views on how things should be, but because they may hold views on how things should be based on their current observations.

We highlight the dissonance between the desired and actual state of culture. We reason that the discrepancy between these two types of cultural values is one way to measure the individuals' dissatisfaction with current reality. Cognitive dissonance theory (Festinger, 1957) suggests people want to reduce their internal conflict if they simultaneously hold two inconsistent cognitions. As such, the existence of ambivalent states might be a source of change in a society. Self regulation theory (Higgins, 1997; Friedman & Foerster, 2001) also suggests that people set goals and then direct their own thoughts and behaviors toward achievement of their goals. When reality deviates from their aspiration, people tend to reduce the gap and reach a desired state of consonance by employing their self-regulatory skills. As such, we explore the possible impact of cultural ambivalence on innovation along the three cultural dimensions. Particularly, we examine the situation where cultural values negatively influence innovation (e.g., uncertainty avoidance and in-group collectivism) and where cultural values positively influence innovation (e.g., performance orientation).

First, we have argued that if a society exhibits higher tolerance of uncertainty, the society may create an environment more encouraging of innovation. Utilizing the two different cultural values ("as is" versus "should be") in a society, we further argue that the tension between actual and ideal states of culture may provide additional explanations regarding innovation. The difference between practice and value based cultures may be a reflection of the society's aspiration to change. In fact, the GLOBE study (Javidan, 2004) found that societies reporting high levels of uncertainty avoidance in their practice-based ("as is") scores tend to show low levels of uncertainty avoidance in their values-based ("should be") scores. Given the negative impact of uncertainty avoidance on firm innovation, it is plausible that if a society shows a

strong desire to reduce uncertainty avoidance in the future, this may in turn increase innovation. In a similar vein, we also have argued that innovative ideas cannot be generated without deviating from the pressure of conformity to rules and norms. Additional analysis in the GLOBE study also found that in-group collectivism scores are negatively associated with success in basic science but positively associated with passiveness, lack of voice and stability (De Luque & Javidan, 2006). As such, when a society shows a strong desire to reduce the level of collectivism compared to current practices, this may provide more beneficial effects on innovation.

Second, theory examining aspirations have suggested that people need high ideal goals or aspiration levels to motivate performance (Friedman & Foerster, 2001). Self discrepancy theory (Higgins, 1987) also postulates that people are motivated to reach a condition where current self concept matches the ideal concept. In line with this argument, the GLOBE study (House et al., 2004) found that a society with lower practice scores may value performance orientation higher. Research shows that performance oriented societies have been economically successful (Gelfand, Bhawuk, Nishii, & Bechtold, 2006). Due to the desirable effects of performance orientation, societies exhibiting low levels of performance orientation in practice may desire a stronger performance orientation. Given the positive impact of performance orientation on innovation, we may expect that when the aspiration level is higher than the actual level of performance orientation, the society's firms may show a strong increase in innovation.

In sum, based on our arguments concerning the negative impact of uncertainty avoidance and collectivism on innovation, we propose that there will be higher innovation when people desire to reduce their "should- be" scores on these dimensions. On the other hand, we propose

that there will be an increase in innovation when people desire more performance orientation in their society as compared to current practice. Therefore,

Hypothesis 4a (b). *The more a society want to reduce its “should-be” value of uncertainty avoidance (in-group collectivism) compared to its “as-is” value, the greater will innovation be.*

Hypothesis 5. *The more a society want to increase its “should-be” value of performance orientation compared to its as-is value, the greater will innovation be.*

METHOD

Sample

In order to test our hypotheses, we assembled a multilevel data set at both the firm- and country-levels of analysis. All individual data for the present study came from the Investment Climate Surveys (ICS) (The World Bank Group, 2005). The database provides comparable information on firm characteristics for all of the countries under study. The survey captures business perceptions regarding the largest obstacles to enterprise growth, the relative importance of various constraints to increasing employment and productivity, and the effects of a country’s investment climate on its national competitiveness. An investment climate survey is normally carried out under the auspices of a national stakeholder, such as an employers association, a development research institution, an indigenous development agency or the central statistical bureau. The observation instrument includes a written questionnaire and face-to-face interviews with managing directors, human resource managers or accountants by professionally qualified enumerators. Detailed information on the ICS is available from the World Bank Group (www.worldbank.org).

From the ICS sample, relevant data were available for the 28 countries that correspond to our GLOBE study cultural variables (House et al., 2004). Sixty-eight percent of the firms in our final sample of 27,509 firms are from manufacturing industries, while 25% are from service industries, with the remainder distributed among agriculture, construction management, and other industries. The median age of sampled firms was 15 years at the time of ICS data collection.

Variables and Data Sources

Dependent variable: Firms' undertaking of innovative initiatives. The ICS provides information on firms' innovation by asking them the extent to which they have undertaken innovative initiatives in the last three years. This measure is not only an actual measure of innovation undertaken but is also tightly aligned with our definition of innovation. Consistent with Schumpeter, our broadly defined innovation includes product and process and technological innovation. Here, the specific three items used to measure innovation are 1) developing a major new product line, 2) upgrading an existing product line, and 3) introducing new technology that has substantially changed the way that the main product is produced. The inter-class coefficient is 0.72.

National culture. For national culture, we used measures from the GLOBE study by House and colleagues (2004) because the scales are originally designed to differentiate between organizational and societal culture. As the GLOBE project stresses, "the scales are most immediately useful to cross-cultural rather than intra-cultural researchers" (House et al., 2004: 146). For the ambivalence variable, we calculated the distance between "should-be" values and "as-is" values. Details are available in Appendix B.

Control variables. To isolate alternative explanations, we controlled for a variety of variables based on two different levels of analysis. For the country level, we took into consideration the economic, political, and societal situation. First, *GDP per capita* (Gross National Product in U.S. dollars) was controlled for because low GDP is a distinct disadvantage due to the limited pools of resources for innovation (Pianta, 1995). The values for GDP were obtained from the United Nations Human Development Report (2002) and log transformed before the analysis.

Second, our variable of education is measured by educational attainment with the United Nations Development Program's (<http://hdr.undp.org/statistics/statistics.htm>) educational attainment score which is a commonly accepted indicator of country-level emphasis on education in previous research (e.g., Parboteeah & Cullen, 2003; Cullen et al., 2004; Martin et al., 2007). The educational attainment score reflects the overall education level of the country. This index is computed as two-thirds of the adult literacy rate plus one-third of the mean year of schooling.

For the variable of political stability, we employed an aggregate measure of indicators by the World Bank (Kaufmann, 2005). The index of political stability refers to perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including political violence and terrorism. This index captures the idea that the quality of governance in a country is compromised by the likelihood of wrenching changes in the government. This indicator aggregates the efforts from numerous institutions such as the 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), and so forth. As a result, this indicator covers more than 200

countries, based on more than 350 variables, obtained from dozens of institutions worldwide. We believe such wide inclusion of sources fits well within our work. To adjust for differences in the metrics of component indicators, we standardized all composite measures for national culture and institutional variables.

As asserted by Child (1972), organizations may command considerable power to influence the conditions prevailing within environments where they are already operating. To isolate firm specific variations, we also take into account a variety of firm-level control variables. The ICS survey was used to measure firm specific characteristics. First, we controlled for the effect of *state ownership*. Research shows that privatization can and does bring needed innovation (Kikeri, Nellis, & Shirley, 1994) but state ownership has a negative effect on a firm's entrepreneurial activity (Zahara, Ireland, Gutierrez, & Hitt, 2000). Second, we controlled for a *manager's ownership* because agency theory (Jensen & Meckling, 1976) has asserted managers often sacrifice long-term investment (e.g., R&D investment for innovation) to maintain short-term growth. Ownership of stock can reduce the problem of divergent interests between principal and agents. Third, we also took into consideration whether a firm has *operations broad* because firms may establish foreign R&D facilities to overcome locational disadvantages (Kim, 1997). Maintaining operations abroad might play an important role in facilitating firm innovation. Fourth, because of mixed results regarding the effect of *size* (e.g., the organizational slack literature suggests that size may play a buffer-role when a firm faces risk but the population ecology literature argues that size may lead to structural inertia that inhibits firms' innovation, (Nohria & Gulati, 1996)), we controlled for firm size by measuring the number of employees. Fifth, we controlled for a *firm's age* because relevant organization theory literature suggests that

firm age is negatively associated with innovation (Kimberly & Evanisko, 1981). Sixth, the percentage of *foreign company's ownership* was controlled because it can mute the influence of national level culture and social institutions (Frost, 2001). Seventh, typical *industry effects* were eliminated by use of categorical variables (manufacturing vs. services). Eighth, and finally, we controlled for three performance variables, including current *market share*, *capacity utilization* and *profits reinvested*, in an attempt to rule out the possibility that different resources of the organization can lead to different rates of innovative initiatives (Nohria & Gulati, 1996).

Analysis Technique: Hierarchical linear modeling

The nested level of analysis induces the problem of violation of independence. Because the assumption of independence is violated in the presence of hierarchical data, ordinary least squares (OLS) methods cannot handle this kind of data (Osborne, 2000). Simply pooling multilevel data and using OLS will generally cause underestimation of standard errors or test statistics which are too high. It often leads to more frequent Type I errors (i.e., predictors turn out to be significant but actually they are not) (Hillman & Wan, 2005).

To overcome the problems associated with a nested design, we employed hierarchical linear modeling (HLM) (Hofmann, 1997; Hofmann et al., 2000). HLM has been used in the management literature as an effective tool for analyzing multi-level models (Hofmann, 1997; Hofmann et al., 2000; Hanges, Dickson, & Sipe, 2004). Underlying the logic of HLM is that two models for the estimation of country level parameters (Level 2) and firm level parameters (Level 1) are computed simultaneously. In this study, level 1 models relationships within each of the lower level units (firm-level variables) and level 2 models (country-level variables) how these relationships within units vary between units (Hofmann et al., 2000). This model is able to take

into account the partial interdependence of individuals within the same group. Typically, the estimates correspond to OLS methods, except the level 2 standard errors avoid the deflation inherent in an OLS approach.

Because our research questions need to examine the effects of level-2 variables (country-level culture) on the level 1 variable (innovation), we use random effects intercept-as-outcomes models. As Hofmann (1997) argued, the HLM approach is appropriate when researchers examine the influence of higher level predictors on the lower level dependent variables while maintaining the appropriate level of analysis. Since our hypotheses mainly investigate the interactions between level 2 variables, we used product terms to test the hypotheses.

RESULTS

Table 1 shows a matrix of correlations and sample statistics of the variables used in this study. To accurately measure the contribution of each country without distortion by sample size, we checked the correlations separately based on level-1 and level-2 variables respectively. The examination of the correlation matrices indicates that there is no cause for concern with the data.

Table 2 reports the HLM analyses, including standardized coefficients for country level and individual level variables predicting innovation. Model 1 and 2 show the results of testing our hypotheses of cultural values. Model 3 shows the results of cultural ambivalence. In order to perform multi-level analysis, we first checked a fully unconditional model (without any predictors) before examining a more complex model. Using intraclass coefficient (ICC), we investigated the existence of significant variation among countries. To do so, we conducted a one-way ANOVA with random effects. The results of ICC values and associated Chi square

TABLE 4.1
Descriptive Statistics and Correlations

Level 1	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11
1. SIZE	217	1202	1										
2. IND	0.73	0.44	0.04	1									
3. FOR	1.87	0.33	0.12	-0.04	1								
4. YEAR	20.4	16.6	0.01	0.08	0.11	1							
5. GOV	5.95	22.9	-0.12	-0.08	0.18	0.14	1						
6. MGR	0.72	0.50	0.00	0.02	0.07	0.01	0.01	1					
7. OPER	0.07	370	-0.05	0.17	0.05	0.05	-0.01	0.03	1				
8. MS	18.9	1.00	-0.17	0.04	-0.07	0.02	-0.01	0.00	0.02	1			
9. CAPA	76.4	0.07	-0.01	-0.10	-0.06	-0.08	-0.19	-0.05	-0.05	0.06	1		
10.REINV	43.6	0.07	0.04	-0.02	0.02	-0.02	-0.08	0.00	0.03	0.04	0.17	1	
11.INNO	0.34	0.37	0.13	0.06	0.02	0.05	-0.05	0.04	0.09	0.02	0.04	0.14	1

Correlations of .02 or greater are significant at $p < .05$, Correlations greater than .014 are significant at $p < .01$

Level 2	Mean	S.D.	1	2	3	4	5	6	7	8	9
1. ASUNC	4.93	0.43	1								
2. ASPER	5.92	0.34	0.68	1							
3. ASCOL	5.67	0.35	-0.27	0.16	1						
4. SHUNC	4.87	0.43	-0.23	0.08	0.62	1					
5. SHPER	5.92	0.34	0.00	-0.15	-0.01	-0.04	1				
6. SHCOL	5.67	0.35	-0.45	-0.29	0.31	0.17	0.53	1			
7. EDU	0.85	0.13	-0.08	-0.23	-0.35	-0.33	-0.11	-0.12	1		
8. POL	0.12	0.83	0.19	-0.23	-0.55	-0.50	0.27	-0.13	0.50	1	
9. GDP	10429	8976	0.10	-0.16	-0.65	-0.48	-0.06	-0.19	0.63	0.77	1

Correlations of .455 or greater are significant at $p < .05$, Correlations greater than .496 are significant at $p < .01$

Level 1: $n = 27,509$, Level 2: $n=28$

GDP per capita was log transformed prior to analysis

TABLE 4.2

Results for HLM Analysis

Variables	<u>Model 1</u> (As-is Culture)			<u>Model 2</u> (Should-be Culture)			<u>Model 3</u> (Cultural Ambivalence)		
	b		s.e.	b		s.e.	b		s.e.
Firm Level (Level 1)									
Industry (IND)	0.27	***	0.05	0.27	***	0.05	0.28	***	0.05
Foreign ownership (FOR)	0.06		0.04	0.06		0.04	0.06		0.04
Firm age (AGE)	0.02		0.01	0.02		0.01	0.02		0.01
Firm size (SIZE)	0.19	***	0.04	0.19	***	0.04	0.19	***	0.04
State ownership (GOV)	-0.04	***	0.01	-0.04	***	0.01	-0.04	***	0.01
Market share (MS)	0.05	*	0.02	0.06	*	0.02	0.05	*	0.02
Operations abroad (OPER)	0.21	***	0.05	0.21	***	0.05	0.21	***	0.05
Capacity utilization (CAPA)	0.00		0.02	0.00		0.02	0.00		0.02
Manager ownership (MGR)	-0.01		0.03	-0.01		0.03	-0.02		0.03
Profit reinvested (REINV)	0.08	***	0.02	0.08	***	0.02	0.08	***	0.02
Country Level (Level 2)									
“As-is” value									
- Uncertainty avoidance (ASUNC)	-0.13	***	0.04						
- Performance orientation (ASPER)	0.28	***	0.05						
- In-Group collectivism (ASCOL)	-0.24	***	0.05						
“Should-be” value									
- Uncertainty avoidance (SHUNC)				-0.01		0.06			
- Performance orientation (SHPER)				0.07		0.06			
- In-Group collectivism (SHCOL)				-0.08		0.05			
“Ambivalence” value									
- Uncertainty avoidance (DIUNC)							-0.12	**	0.04
- Performance orientation (DIPER)							0.37	***	0.06
- In-Group collectivism (DICOL)							-0.29	***	0.07
Educational attainment (EDU)	0.32	***	0.05	0.35	***	0.06	0.29	***	0.04
Political stability (POL)	0.13	*	0.06	0.01		0.09	0.32	**	0.08
GDP per capita ^{a)} (GDP)	-0.27	***	0.09	-0.02		0.13	-0.32	**	0.11

^{a)} GDP per capita was log transformed prior to analysis

Level 1: n = 27,509, Level 2: n = 28

* p < .05, ** p < .01, *** p < .001

statistic show that a subsequent amount of the variance in firm innovation resided at the country level ($\chi^2= 11782.7$, d.f.=27, $p<0.001$). Thus, it is supported that this model is appropriate for a multilevel analysis and, as such, we proceeded to the complex model.

We also calculated variance explained by the models based on the principle of “proportional reduction of prediction error” (Snijder & Bosker, 1999: 101). The basic idea is variance explained may be calculated by the proportional reduction in the residual variance.

parameter due to the joint predictor variables. This R^2 is not a total variance in outcome variable but a relative variance that can be predicted by the given independent variables (Hoffman et al., 2000). This formula has been extensively used in previous literatures (e.g., Martin et al., 2007, Hoffman et al., 2000, Marrone, Tesluk, & Carson, 2007; Bommer, Dierdorff, & Rubin, 2007; Raudenbush & Bryk, 2001). The country level predictors in practice based on cultural values (“as-is”) accounts for 23 percent of the between group variance for the model while those in the value based cultural values does not add any significant variance explained. When we added the ambivalence scores, model 3 shows 15 percent of more variance explained.

Results show general support for our hypotheses. Even after adjusting for the firm level influences, the results show the strong cultural impact. As we hypothesized, the country level cultural value of uncertainly avoidance has a significant negative effect on firm level innovation ($\beta =-0.13$; $p < 0.001$). The cultural value of in-group collectivism also shows a significant negative coefficient ($\beta =-0.24$; $p < 0.001$). On the other hand, we found that performance orientation has a significant positive effect on innovation ($\beta=0.28$; $p < 0.001$). Thus, hypotheses 1a, 2a and 3a are supported. However, we found no significant coefficient for “should-be”

cultural values. Thus, hypotheses 1b, 2b and 3b were not supported ($\beta = -0.01, 0.07$ and -0.08 , respectively).

In hypothesis 4a and 4b, we posited that the more a society wants to reduce the “should-be” value of uncertainty avoidance and in-group collectivism as compared to “as-is” values, the greater would innovation be. As expected, we found statistically significant negative coefficients for these hypotheses. ($\beta = -0.12; p < 0.01$ and $\beta = -0.29; p < 0.001$). Therefore, hypothesis 4a and 4b are supported.

In hypothesis 5, given the positive effect of performance orientation on innovation, we proposed that the more a society wants to increase the “should-be” value compared to the “as-is” value, the greater innovation would be. We found a statistically significant coefficient for this hypothesis ($\beta = 0.37; p < 0.001$). Thus, hypothesis 5 is supported.

DISCUSSION

There have been numerous calls of inquiry concerning the nature of cultures and whether they are immutable and unequivocal (Leung, Bhagat, Buchan, Erez, & Gibson, 2006; Nakata, 2003; Yaprak, 2008). While the imperativeness of this issue cannot be underestimated, it is surprising that little has been done to examine this fundamental issue in culture theory. This study attempts to fill in this gap by addressing the importance of cultural ambivalence within a nation. Drawing on the advantage of multi-level theoretical and methodological lenses, we explored nearly twenty seven thousand firms from 28 countries. To the best of our knowledge, this is the first research that addressed the consequence of cultural ambivalence on organizational effectiveness.

Specifically, our results support the idea that cultural values of uncertainty avoidance and in-group collectivism are negatively associated with innovation while performance orientation shows a positive relationship. It is notable that this is only true when we use the practice-based measure (“as-is”). Our multi-level analysis shows that asking someone to describe the actual situation may be a better measure to predict firm innovation than asking for agreement with ideological statements. We believe this is an important finding to culture theories because the results run counter to conventional wisdom. Many studies are only concerned with “should-be” values because researchers often assume values drive practice (e.g., onion assumption).

Our results also confirmed that the state of ambivalence does not always negatively impact organizational effectiveness. Rather, it is possible that the state of ambiguity and ambivalence are nothing but the natural course of our everyday life (Hajda, 1968). As cognitive-dissonance theory suggests (Festinger, 1957), if there is dissonance, people tend to reduce the conflict by changing their attitude. As such, the existence of ambivalence might be a source of change in a society thereby enhancing innovative activities. Given the negative impact of uncertainty avoidance and collectivism, we found that innovation increases when people might desire to reduce their “should- be” scores compared to the “as is” practice. On the other hand, we found innovation is higher where people desire a stronger performance orientation in their society as compared to the current practice.

IMPLICATIONS AND EXTENSIONS

Departing from the assumption that societies may have a collective conscience, we employed the view that members of a society may feel ambivalent about what the culture currently is like and what the culture should be. We explored the practical implication of this

ambivalence and the consequences on innovation. Our results have implications for both theorists and practitioners.

Our results raise an interesting question for the theory of “cultural distance” (e.g., Kogut and Singh, 1988; Shenkar, 2001; Morosini, Shane, & Singh, 1998). Since there are two different types of cultural values (as-is and should-be), simple cultural distance may not be accurate due to cultural ambivalence. For example, it is possible that the mixed and inconclusive results of cultural distance (Stahl & Voigt, 2005; Teerikangas & Very, 2006; Morosini et al., 1998; Björkman, Stahl, & Vaara, 2007) may be partly due to the fact that research has not taken into account the ambivalent state of cultural values. In a practical sense, what if a society shows a low cultural distance in terms of “as-is” values but high cultural distance in terms of “should-be” values? This is true for many societies that have gone through substantial changes. As Tung (2008) pointed out even if the Japanese culture has often been regarded as being closer to that of China (due to their historical relationship and borrowing from China things such as Chinese characters), current Japanese citizens tend to identify themselves more closely with the West ever since the Meiji Restoration (Tung, 2008). She further argued that asserting Japan and China as having similar cultures may be spurious. We believe that taking into account cultural ambivalence may provide a valuable alternative explanation for the research on cultural distance.

Our results suggest that practice-based cultural values have more predictive power than values-based cultural values. This finding opens some interesting questions regarding cognition vs. behavior. According to Hofstede (1991), we can see practices of culture on the surface layer of the “onion.” To better understand a culture, all we have to do is simply peel the layer of the onion to reach its core. This core will eventually guide and drive human behavior. In other words,

an important premise here is values determine behavior and not vice versa (Fang, 2006). While the outer layers of the onion may change, the core of the onion remains unchanged. This means that the behavioral part of culture may vary under different circumstances but the “software” of culture – that is, the deeply rooted values- will not change (Hofstede, 2001: 394). If we adopt the fundamental logic of the onion assumption in that “values drive practices” and “the core of the onion is stable over time,” there is no reason to believe a society’s culture would change over time. However, as researchers often have pointed out (Fang, 2006; Nakata, 2003), the relationship between values and behavior cannot be restricted to one direction. Not only do values and beliefs drive practices, practices also can shape values. Drawing on cognitive dissonance theory (Festinger, 1957), Bem (1970: 54) also concluded that changing behavior is one of the most effective ways to change the hearts and minds of people. While cognition may be important, the behavior of individuals might also be important in defining culture (Derne, 1994; Nakata, 2003; Yaprak, 2008). Some researchers further argue that behaviors are more integral to culture because “in the end it is not what people say are important to them that matters, but rather what they actually do” (Nakata, 2003: 216). Our findings also suggest that behavior based cultural values are more suitable at least within the context where we predict firm innovation.

Our results also inform firms and decision makers of the importance of culture. This is important because it is often reported that most managers are not entirely unaware of the consequence of culture (Lueng et al., 2005). Our findings show that managers need to be cautious against simple application from domestic practice to other countries because the empirical results show that substantial variance in innovation can be explained by between-country variations. Considering country specific contexts (e.g., cultures) may significantly

influence the success of innovation strategies of firms. In a similar vein, Shane (1995) also argued that the choice of location for better innovative activities becomes an important strategic decision for managers in most MNEs. As Dunning (1980) suggests, culture can be an important factor for “locational advantage.” However, our study also cautions against cultural attribution error (Leung et al., 2005: 370), which presumes the “establishment of stereotypes based on nationality, and the assumption that all members of a particular nation will behave in accordance with the stereotype.” We argue that if there is significant difference between as-is values and should-be values, managers need to be cautious about cultural attribution errors.

While we have explored a novel area of culture theory, this study also has its limitations. First, this study is cross sectional. Given that cultural ambivalence may involve a high potential for change, it might be interesting to examine the dynamic nature of culture based on longitudinal data. Culture may not only be multi-faceted but also an ever-changing construct over time. Since the modern business environment is typically characterized by turbulent political, and economic change (Leung et al., 2005), future research on cultural change at the national level might be very fruitful.

Second, this study only investigated the effect of country level variables on firm level outcomes (intercept-as-outcome model). A strong theoretical understanding of culture may drive researchers to explore cross-level interactions. For example, as social identity theory (Turner, 1987; Leung et al., 2005) suggests, it is possible that when a person (micro level) identifies him or herself with a national culture (macro level), the culture tends to be a large part of his or her self-concept. We believe the interactions between micro and macro levels have potential for future research.

Third, we only explored two dimensions of cultural values - that is, the practice and values based culture. However, it is also plausible that every country has more than two cultural values such as cultural groups (Naylor, 1996; Fang, 2006). It might be interesting for researchers to investigate the interactions among these cultural groups and change in a society's culture. The meso level research (e.g., organization- industry specific culture grouping) also provides significant research potential.

In conclusion, we have attempted to explain how national culture can explain differences in firm innovation. By challenging the notion of unequivocal cultural dimensions, we have introduced a potentially fruitful area for cultural research. It is hoped that future research can build on the foundation provided by our research to explore the complex nature of culture and its impact.

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CHAPTER FIVE

DISSERTATION SUMMARY AND GENERAL CONCLUSION

This dissertation investigated the issue of innovation and innovation and entrepreneurship within three broad contexts: US domestic, internationalization and cross-cultural contexts. The first essay investigated U.S. new ventures that went public from 2001 to 2003. I particularly looked into earnings management at the time of lockup expiration. We found that there are significant negative price reactions when the lockup agreements expire. Further, this study shows that the amounts of negative abnormal returns at lockup expiration provide a good signal to predict IPO firms' earnings management because insiders want to maximize their wealth when they are free to sell their shares. Finally, we also found the subsequent roles of venture capitalists that influence new ventures to manage earnings at the time of IPOs.

The second essay examined the international entrepreneurship. I particularly focused on internationalization from emerging countries rather than from the developed countries. We developed a multi-level theoretical model using firm- and country-level factors to systematically assess the reasons for internationalization for such firms. We found that technological and human dependence on foreign countries are positively associated with internationalization. Further, cross-level effects suggest that favorable institutional environments that provide critical resources to such firms enhance their likelihood for internationalization to overcome their dependence on foreign sources.

Finally, the third essay investigated a cross-cultural analysis on innovation. Given that the simple unequivocal notion of cultural dimensions is not satisfactory to explain the true nature of culture, this study introduced the notion of "cultural ambivalence" to explain firm innovation.

We argued that each society has multiple and ambivalent concepts of culture so that researchers can distinguish between practices (“as is”- meaning the way things are) and values (“should be”- meaning the way things should be). Data for 26,859 firms from 27 countries were analyzed using Hierarchical Linear Modeling (HLM). Results show that “as-is” cultural values are strong predictors for firm level innovation. Furthermore, this study provides the empirical evidence that the state of cultural ambivalence could be a source of change in a society. It is hoped that future research can build on the foundation provided by our research to explore the interesting subject of entrepreneurship and innovation.

APPENDIX A

THE MEASURE OF INNOVATION

Innovation (= .72) (*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

APPENDIX B

NATIONAL CULTURE VARIABLES

GLOBE STUDY: (Unless indicated, all items 1 = strongly agree, 7 = strongly disagree)

Performance orientation (As-is: $\alpha = .72$; should-be: $\alpha = .90$)

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

In-Group Collectivism (As-is: $\alpha = .77$; should-be: $\alpha = .66$)

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 (As-is: $\alpha = .88$; should-be: $\alpha = .85$)

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).