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Abstract: This study examines the performance implications of strategic patterns in China's high-tech industry through a survey of 126 Chinese high-tech companies. The results show that the Chinese high-tech companies with technology-strategy integration perform significantly better, while those with a market orientation are also associated with superior performance. Successful Chinese companies tend to develop a technology culture as a competitive strength influencing their strategies and performance. Also, the Chinese government exerts a strong influence on Chinese high-tech companies and their performance. Research and managerial implications are discussed.

Abstract: This research identifies areas of economic, experiential and logistical enhancement that will lead to increased visits to and expenditures at international attractions by border-area tourists. Dimensions shown to be salient to these cross-border travelers' decisions include value (the combined consideration of price and quality issues), informational and experiential (relevant media exposure and the affective, service and variety elements of the travel experience), and practical considerations associated with the border crossing (traffic and customs enforcement). Two benefit segments emerge (value and experiential). Value appears to have a ceiling effect when it comes to investments in value delivery for cross-border visitors. However, value-based strategies may be the most efficient route to attracting those of this large segment who are not yet satisfied with this aspect of cross-border travel. The Experiential segment, though smaller, is highly susceptible to improvements in communication, service, variety, and the affective aspects of the foreign-travel experience.

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Abstract: Studies of the relationship between economic development and financial service activities typically focus on banking or insurance alone with the majority of the literature focused on the banking-development relationship (Hussels, Ward and Zurbruegg, 2005). We consider the possibility that both banking and insurance influence economic development and that the relationship is recursive. We conclude that the focus on banking in the literature is justified; we find a significant positive relationship between economic development and banking penetration but we do not find convincing support for such a relationship between development and insurance penetration.

Abstract: Thailand, one of the world's leading sugar producers, has tried to increase its level of sugar production by persuading farmers of competitive crops to grow sugar canes. Therefore, this research seeks to examine sugar cane farmer's decision to grow sugar canes vs. competitive crops (cassava, rubber, and eucalyptus) by examining four independent factors: cane price, competitive crop price, sugar mill support, and community support. Conjoint analysis with data from Thai farmers indicates that the first three factors significantly influence the farmer's choice of crops to grow (sugar canes vs. competitive crop). Research implications and future research directions conclude the study report.

Abstract: This paper utilizes panel unit root, panel unit cointegration, and panel error correction model techniques to examine the corruption-economic growth nexus in a panel of four BRIC countries (Brazil, Russia, India, and China) over the 1995 to 2009 period. The empirical results show that there is a significant positive relationship between corruption and economic growth in the short run. However, in the long run, corruption is no longer the most important factor that affects economic growth. Instead, foreign direct investment and the degree of economic openness are the key factors that influence a country's economic growth.

EDITORIAL

As a major determinant of success in many industries, technology strengthens the competitive position of the national economies. Furthermore, the integration of technology with market opportunities is seen a key to success in high tech companies. Therefore, the study by Hong Liu, Hang Liu, and Paul Jackson examines the performance implications of strategic patterns in China's high-tech industry through a survey of 126 Chinese high-tech companies. The results of the study suggest that the Chinese high-tech companies with a high level of technology-strategy integration perform significantly better both financially and operationally, while those with a market orientation are also associated with superior performance.

A significant number of Chinese high-tech firms pursue a cost orientated strategy, which tends to be negatively associated with performance. Successful Chinese companies are apt to develop a technology culture as a competitive strength influencing their strategies and performance. Also, the Chinese government exerts a strong influence on Chinese high-tech companies and their performance. This suggests that when entering or operating in China's high tech industry, multinational corporations (MNCs) should pay close attention to the role of Chinese Government as an influencer or gatekeeper and make sure that they compete at a level playing field. When large projects are involved , it is often effective for politicians in multinational corporations' home countries to support their business development in China.

The second paper by Kenneth R. Lord, Michael O. Mensah, and Sanjay Putrevu explores the factors that will keep those on whom international tourist attractions rely for the greater share of their revenue coming back for more. Based on a survey of consumers in the North American border region that is home to one of the world's top natural attractions – Niagara Falls – it attempts to identify areas of economic, experiential and logistical enhancement that will lead to increased visits to and expenditures at tourist venues. A key to the economic success of international tourist attractions is to induce repeat visits from their most regular patrons who come disproportionately from short and medium distances away. In their study, Lord, Mensah, and Putrevu identify dimensions that are salient to these border-area travelers' decisions to patronize such attractions and benefit segments associated with those dimensions, and then propose marketing strategies of relevance to the segments.

The potential influence of an array of variables is considered, including economic considerations (price, exchange rate, tax savings), perceived quality of the attraction itself and of services experienced in visiting it, information exposure (advertisements and media coverage), the fun or novelty of the "foreign" experience, and border-crossing issues (traffic and customs enforcement). The following research propositions are offered:

[1]   Improvements in the following areas will enhance the appeal and the
        frequency of visits to attractions in adjacent countries for consumers living in
        border areas:

a. Economic conditions (e.g., lower prices, more favorable exchange rates, tax breaks);

b. Quality of attractions and associated services;

c. Information exposure (e.g., targeted advertising, media coverage);

d. Affective allure of the "foreign" experience (e.g., enhancements to the novelty and "fun" factor);

e. Border-crossing experience (e.g., better traffic management, expedited and stress-free customs enforcement).

[2] Consumers can be categorized into distinct psychographic segments based on the extent to which they report that improvements in the above variables would increase their visits to attractions in the host country.

Consumers living on the U.S. side of the border participated in a survey about their cross-border-travel experiences, purposes, perceptions, satisfaction and intention. To identify patterns of influence which could be used to identify benefit segments and to assess the relationship of the influence variables with the dependent constructs identified earlier, principal-components analysis was used. Three factors emerged. The first combines high loadings on the economic variables (exchange rate, price and tax savings) with one for attraction quality, suggesting that respondents were considering not only the costs but also the quality of the experience in arriving at an estimate of value of the experience of visiting attractions across the border, and is thus labeled "Value." The second combines the informational constructs (advertising and media coverage) with experiential dimensions of visits to foreign attractions (fun and novelty of the foreign travel experience, helpful and friendly service, attraction variety) and has been named "Informational & Experiential." The two border-crossing variables (customs enforcement and border traffic) have the only high loadings on the third factor, "Border Crossing."

Use of the uncorrelated factor scores provides a basis for estimating the relationship between the influence variables and the two dependent variables (relative appeal of the neighboring country as a travel destination and intended future frequency of visits to attractions there). The relationship between the influence of improvements in the value (cost and quality) of the experience of visiting attractions in the neighboring country and current perception of that country's appeal for such a purpose is negative. This suggests that those who would most be influenced to visit such attractions through improvements in the value offering are those whose current perception of the Canadian market's attractiveness is relatively low. The Value and Informational/Experiential factors were significantly related to the anticipated frequency of future visits to the neighboring country's attractions. In other words, the very consumers whose behavior would most be influenced by improvements in those two areas are the ones on whom the foreign attractions disproportionately rely for their revenue, since they project the highest frequency of future visits. These results provide tentative evidence consistent with points (a), (b), (c) and (d) of the first research proposition, but not for (e).

K-means cluster analysis was applied to establish whether distinct benefit segments could be identified based on the responses to the influence items. Nearly two thirds of the sample constituted a "Value" segment, with cluster centers revealing that they were somewhat more strongly influenced by value than the sample as a whole but were less responsive than average to improvements in the informational/experiential and border-crossing dimensions. The remaining respondents (labeled an "Experiential" segment), just over a third of the sample, were less susceptible than average to value but more responsive to the other two factors for informational/experiential and border crossing. Results are consistent with the second research proposition and reveal that these segments are defined almost exclusively on a psychographic (benefits) basis, with little in the way of demographic differences to distinguish them.

Practically, this suggests that no single strategy will appeal to all and tourism managers will need to devote attention and resources to both value and experiential dimensions of their offerings to cross-border travelers. The task is complicated by the lack of demographic discriminators between the two segments, but carefully crafted value offerings and communication strategies should enable either type consumer to self-select those of most relevance and appeal, with the consequence being a higher level of satisfaction and patronage among those short- and medium-distance travelers on whom attractions must rely for repeat patronage and revenue in the current economic climate.

A review of a Canadian Tourism Commission report based on research conducted in 2007 provides a useful check on both the face validity and the strategic value of the findings of Lord, Mensah, and Putrevu's study. The authors of the study agree in key dimensions and findings with the results obtained in the Canadian research. However, the distinct factors and segments that emerge in their study afford an opportunity for more precise targeting of the value- and experience-based strategies that the Canadian report proposed. Similar benefits may also arise in other border markets.

"Schumpeter argued that the services provided by Financial Intermediaries—mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions—are essential for technological innovation and economic development" (King and Levine, 1999, p. 717). The hypothesis that the level of financial activity is determined, in part, by the level of economic activity within a geographic area is well researched for both banking and insurance but the second hypothesis is less studied with respect to insurance activity. The imbalance is rarely explained – the banking literature concentrates on banking, the insurance literature concentrates on insurance. No prior study specifically both banking and insurance and none considers the demand-economic development relationship to be simultaneous.

The seemingly unrelated regression model employed in the third study by James Barrese, Albert Beer, Nicos Scordis, Ping Wang, and Colin Linsley relies on data for 101 countries; this is a much larger and demonstrably representative sample. Most of the existing literature, in contrast, is based on small samples that typically exclude less developed countries due to data gathering difficulties. Such samples are demonstrably not representative of the world development distribution.

Studies of the relationship between economic development and financial service activities typically focus on banking or insurance alone with the majority of the literature focused on the banking-development relationship. Barrese, Beer, Scorids, Wang, and Linsley consider the possibility that both banking and insurance influence economic development and that the relationship is recursive. The authors find a significant positive relationship between economic development and both banking and insurance penetration but observe a much higher level and statistically stronger link for banking relative to insurance activity. They conclude that the higher degree of focus on banking activity in the economic development literature is justified.

Thailand is one of the world's leading sugar producers and exporters. It has attempted to catch up with more advanced sugar producing countries such as Brazil, South Africa and Australia by trying to increase its level of production. One approach to increase sugar output is to expand the land of growing sugar cane. As most of the arable land in Thailand is already used for crop growing, trying to increase the cane-growing land inevitably means persuading growers of other crops (e.g., rubber, cassava, and eucalyptus) to switch to growing canes.

To increase the cane supply, the fourth research paper by Kawpong Polyorat examines the sugar cane farmer's decision to grow sugar canes vs. other competitive crops. A preliminary discussion with a major sugar mill in Thailand suggests four primary influencing factors: cane price, competitive crop price, sugar mill support, and community support. Therefore, the present study attempts to examine how these four factors influence farmer's decision.

In the research design, cane price, competitive crop price, and mill support have three levels (low, medium, and high). The fourth independent variable- community support- also has three levels but is categorized as "most people in the community do not grow canes," "most people in the community grow canes," and "the community leader grows canes." A conjoint analysis with fractional factorial design was used to avoid the respondents' fatigue. Face-to-face interviews were conducted with 47 farmers in one of the major areas for sugar cane production in Thailand. They were asked whether they will choose to grow sugar canes or competitive crops given different combinations of cane price, competitive crop price, mill support, and community support.

Logistic regression is used to analyze the data. Cane price (low, medium, high), competitive crop price (low, medium, high), mill support (low, medium, high), and community (most people in the community do not grow canes, most people in the community grow canes, the community leader grows canes) are independent variables. The last category of each independent variable is used as the reference point. Crop decision (canes vs. competitive crops) is the dependent variable.

The results of Polyorat's study reveal that cane price, competitive crops price, and mill supports significantly influence the decision to grow canes (vs. competitive crops) while community supports do not. The higher cane price and the lower competitive crop

price attract farmers to grow canes (as opposed to competitive crops). Similarly, the higher level of mill supports also encourages farmers to grow canes (as opposed to competitive crops) although its impact is lower than that of the cane price and competitive crop price. Contrary to expectation, however, community does not have a significant influence on this decision.

As both cane prices and competitive crop prices have stronger impact than mill supports, the crop prices are undoubtedly the most critical factors farmers take into consideration in their selection of crop choices. However, the crop prices are often not the factor under the control of sugar mills. In fact, sugar and sugar cane prices are closely influenced government regulation and intervention.

As a result, mills may need to turn to 'support and service" as strategic tools to encourage farmers to grow canes instead of other competitive crops. In fact, the results from the conjoint analysis implies the compensatory model of decision where a drawback of one attribute can be compensated or offset by the good point of another attribute of the given product. If this is the case, as sugar mills lack control over market prices of sugar canes and competitive crops, sugar mills, therefore should resort to relationship marketing with farmers. That is, mills may focus on providing several services or supports to each farmer, interacting with each farmer on a regular basis, soliciting farmer's participation, and working on long-term objectives. However, as the results of Polyorat's demonstrate no significant impact between the medium vs. high level of relationships, a mill, therefore, may not have to devote all of their resources for this support, but rather make sure that at least some level of support and service is achieved. Furthermore, while a sugar mill should continue offering services which are not offered by other competitive crops, a sugar mill must try to make those services be viewed by farmers as not less valued than the differential prices. Word-of-mouth and marketing communication could be used to form or change the present perception, attitude, and satisfaction. Moreover, a mill may try to provide support in a more innovative way that directly affects livelihood of the farmers' community such as irrigation system, infrastructure, caring for environment, and education of growers' kindred.

The commonality between the four BRIC countries is that they represent large countries with huge populations that have immense needs and therefore, buying power. Among the BRIC countries, China, India, and Russia benefit additionally from their immense man power, while Russia and Brazil enjoy bountiful natural resources. In the recent years, these countries have experienced significant economic growth not only because of the aforementioned reasons, but also because they have exported large amounts of products, services, and resources, and thus have rapidly accumulated foreign reserves. However, the BRIC countries are not without other economic issues, including large income gaps between the rich and the poor and money debt resulting from political corruption. However, even though the BRIC countries have lower corruption perception index values and therefore face significant corruption, these countries still manage to enjoy high economic growth rates that are likely fueled by significant foreign investments.

Due to growing concern over corruption's harmful effects on economic and social development, researchers have conducted numerous studies to explore the relationship

between economic growth and corruption. While the results of most empirical studies suggest that corruption negatively impacts economic growth, some scholars believe that corruption has an opposite effect. More specifically, this point of view suggests that corruption heightens the administrative efficiency of government agencies and decreases the transactions cost of time, thus positively stimulating economic growth. Given that previous empirical studies on the relationship between corruption and economic growth have largely led to different results and interpretations, the fifth research paper by Yuan-Hong Ho and Chiung-Ju Huang contributes to this line of research by using the newly developed panel unit root tests, panel cointegration tests, and panel-based error correction model to investigate the relationship between economic growth and corruption among the BRIC countries over the period of 1995 through 2009.

The empirical results of Ho and Huang's study suggest that among the various factors responsible for economic growth, direct foreign investments and economic openness represent the most influential variables, with economic openness specifically having a significant, in-direct correlation with corruption. The results also suggest that the lag one and lag two periods of the corruption perception index have a direct impact on economic growth. However, this direct impact is only statistically significant during the lag one period. Finally, the empirical results also suggest that government expenditure and economic growth do not have a statistically significant direct correlation. In the short run, the observation where high corruption is accompanied by strong economic growth appears to be valid. However, in the long run, the results do not validate the claim that higher corruption is beneficial to economic growth because economic growth depends on country-specific factors such as direct foreign investment and market openness. While the empirical results of Ho and Huang's study do not suggest that corruption level has a significant influence either on foreign investments, government expenditures, or economic openness, the authors believe that in the long run, unless their respective corruption levels have receded, these emerging market economies will cease to flourish once their economy reaches a certain threshold.

Nejdet Delener, Ph.D.
Editor-in-Chief

NOTE FROM THE EDITORS

As an interdisciplinary journal, *The Journal of Global Business and Technology* (JGBAT) serves academicians and practitioners in the fields of global business and technology and their related areas. The JGBAT is also an appropriate outlet for manuscripts designed to be of interest, concern, and applied value to its audience of professionals and scholars.

Readers will note that our attempt to bridge the gap between theory and practice has been successful. We cannot thank our reviewers enough for having been so professional and effective in reiterating to contributors the need to provide managerial applications of their research. As is now obvious, the majority of the articles include a section on managerial implications of research. We wish to reiterate once again our sincere thanks to JGBAT reviewers for having induced contributors to answer the "so what?" question that every Journal of Global Business and Technology article is required to address.

Thank you for your interest in the journal and we are looking forward to receiving your submissions. For submissions guidelines and requirements, please refer to the Manuscript Guidelines at the end of this publication.

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CHINA'S HIGH-TECH FIRMS: STRATEGIC PATTERNS AND PERFORMANCE

Hong Liu, Hang Liu, and Paul Jackson

ABSTRACT

This study examines the performance implications of strategic patterns in China's high-tech industry through a survey of 126 Chinese high-tech companies. The results show that the Chinese high-tech companies with technology-strategy integration perform significantly better, while those with a market orientation are also associated with superior performance. Successful Chinese companies tend to develop a technology culture as a competitive strength influencing their strategies and performance. Also, the Chinese government exerts a strong influence on Chinese high-tech companies and their performance. Research and managerial implications are discussed.

INTRODUCTION

Technology is a major determinant of success in many industries, strengthening the competitive position of national economies (Zahra and Covin, 1993; 1994; Price, 1996). Technological advances provide opportunities for new products, new markets and new industries (McCarthy, Spital and Lauenstein, 1987), rapidly changing the nature of competition (Bettis and Hitt, 1995). High-technology (high-tech) industry has become a locus of organizational research in the last three decades (Rogers, 2001).

The strategic fit paradigm developed based on Western market economies can be applicable in transitional economies only after it is refined (Lukas, Tan and Hult, 2001). Transitional economies pose severe environmental challenges for international firms (Li and Atuahene-Gima, 2001; Peng and Heath, 1996). The Chinese government continues to protect its strategic industries through high entry barriers (Luo and Park, 2001). The business environment in China is uncertain (Tan and Litschert, 1994). These indicate that the business environment of China's high-tech industry presents hugely different characteristics from that in the West.

To effectively examine a company's strategic behavior and associated performance implications, strategies are commonly distinguished and classified into different types or 'patterns', such as Miles and Snow's (1978) typology for four responsive strategies, Porter's (1980) three generic strategies and Mintzburg

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Dr. Paul Jackson has published widely in the area of organization studies. His current research interests are in strategy implementation, strategic decision-making processes, employee engagement, organizational ambidexterity and teamworking in complex organizations.

Dr. Hang Liu has recently completed his PhD at Manchester Business School and joined China Life Asset Management Company Limited.

and Waters' (1985) eight types of strategies, based on firms' strategic objectives, investment choices and competitive advantages (Galbraith and Schendel, 1983). However, there is no universal strategic typology that is optimal for all businesses (Ginsberg and Venkatraman, 1985).

Given the limited studies on environment-strategic pattern-performance in China's high-tech industry, this study is intended to identify the major patterns of business strategies adopted by Chinese high-tech firms and the associated influential factors as well as assess the performance implications of these strategic patterns. It makes a contributing addition to the literature concerning strategic management in Chinese high-tech firms.

LITERATURE REVIEW

In the 1970s and 1980s, research into high-tech industries was mainly descriptive, generalizing their characteristics (e.g. Maidique and Hayes, 1984; Quinn and Paquette, 1990) and addressing how to manage high-tech firms successfully (e.g. McCarthy et al, 1987; Schoonhoven, 1984). In the 1990s, the successful development of high-tech firms attracted much attention from academics, and a number of theories have been developed especially for high-tech companies, such as Gersick's Time Pacing (1994) and Eisenhardt's and Sull's Simple Rules (2001). A strategic pattern labeled 'competing on the edge', combining the 'edge of chaos' and 'high velocity' systems developed by Brown and Eisenhardt (1998), is changing traditional mindsets in strategic classification and thinking.

The integration of technology with market opportunities is seen as a key to success in high-tech companies (Hughes, 1990; Song and Montoya-Weiss, 2001). 'Technology strategy' has emerged to support firms' long term strategic direction (Dowling and McGee, 1994). An alignment between strategy and environment is associated with superior performance in high-tech industries (Lee and Miller, 1996; Lukas, Tan and Hult, 2001). Strategies for technological development are closely tied to the success of high-tech industries (Chang and Tsai, 2000). Strategic alliance as a strategy has been an area of interest in research on high-tech industry (Peng and Heath, 1996; Tsang, 1996), to gain market access and obtain strong manufacturing or distribution capability and R&D expertise or good management capability (Cyr, 1999) as well as to seek successful product innovation (Kotabe and Swan, 1995).

Concerning research on Chinese high-tech firms, the role played by Chinese returnees in China's high-tech industry is examined (Tan, 2005). National culture influences the strategic actions of Chinese high-tech entrepreneurial firms (Ahlstrom and Bruton, 2002). It is found that management cognitions on the future of the industry and current operation and performance of the firm are positively associated with firms' market-focused strategic orientation (Lau, Yiu, Yeung and Yuan, 2008). However, few studies have addressed the strategic patterns of Chinese high-tech firms and their performance implications.

A FRAMEWORK AND HYPOTHESES

Figure 1 presents a framework for this study. It is based on the strategic contingency theory that has been widely accepted in the field of strategic management (e.g. Venkatraman and Prescott, 1990; Lucas et al, 2001). The theory indicates that a co-alignment between task environmental factors and firms' strategies is positively associated with performance (Tan and Litschert, 1994; Lee and Miller, 1996). The external environment generally comprises the factors that influence the company's functioning and strategy, such as industrial dynamism, complexity and munificence (Dess and Beard, 1984; Luo and Peng, 1999). The internal environment consists of factors such as leadership (Maidique and Hayes, 1984), organizational culture (Riolli-Saltzman and Luthans, 2001) and organizational capabilities (Moorman and Slotegraaf, 1999). In this study, we focus on three external environmental factors: government effect, uncertainty and rapid change and a single internal factor organizational technological culture.

With regard to 'Strategy', Miller (1986) summarized some of representative strategic variables, and among others, 'differentiation' included 'innovation' and 'marketing'. Zahra and Covin (1993) examined four strategy dimensions: commodity-to-specialty products, marketing intensity, cost leadership and product line breadth. Since this study focuses on Chinese high-tech firms, 'strategy' in the framework mainly focused on three dimensions: 1) technology-strategy integration, 2) market orientation and 3) cost leadership. Conceptually, technology-strategy integration and market orientation may be seen as Porter's (1985) 'differentiation' strategies.
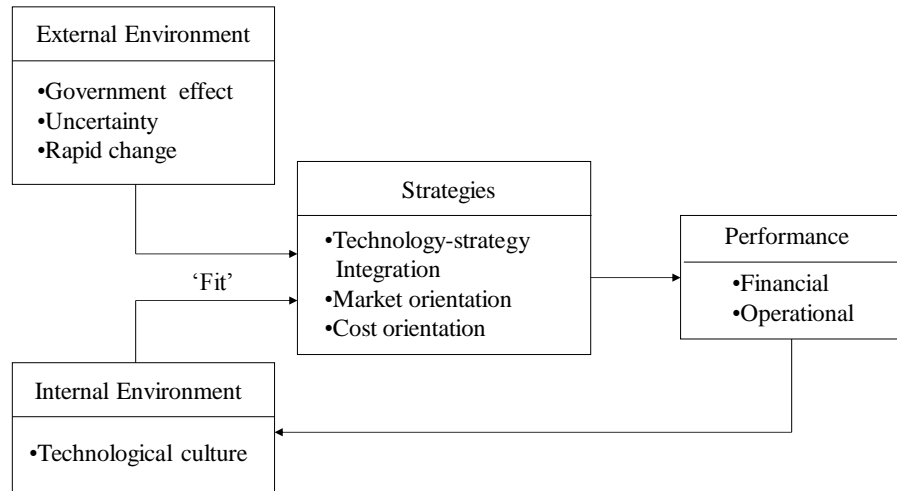
Figure 1. A Framework for Strategic Patterns of Chinese High-tech Firms

Strategy and Performance

Technology-strategy Integration

By 'technology-strategy integration' it means the degree to which the development or adoption of a technology by the firm is driven by the attainment of firms' strategic objectives. It is related to the pursuit of Porter's (1985) 'differentiation' strategy. A firm with a higher level of technology-strategy integration means that it has achieved a good 'fit' between strategy and technology, enabling the firm to attain better performance than its competitors (Iansiti and West, 1997). Technology-strategy integration can create technological synergy across business units and sustain a key technological competence (Chester, 1994). It is advocated that technology should be integrated with strategy to maximize its benefits and gain competitive advantage (Stacey and Ashton, 1990). The achievement of technology-strategy integration is seen as one of the important sources of sustainable competitive advantage (Bettis and Hitt, 1995). Superior performance may be gained when strategy and structure are congruent with the competencies and constraints of the firm's technological choice (Parthasarthy and Sethi, 1992). In the context of Western countries, a type of strategy adopted by high-tech firms leading to better performance is 'technology leadership' (Porter, 1980), as evidenced by the practices of Japanese companies (Deshpande et al, 1993). However, as Chinese high-tech firms are latecomers, the overwhelming majority of them are technological followers or imitators, and it would be unlikely to find a notable number of the Chinese high-tech firms pursuing technology leadership. Thus, it can be hypothesized:

H1a: Technology-strategy integration pursued by Chinese high-tech companies is positively associated with performance.

Market Orientation

Market orientation, a foundation of marketing management, is defined as 'the organizationwide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organizationwide responsiveness to it" (Kohli and Jaworski, 1990). The successful adoption of market orientation is found to result in better performance in traditional industries (Jaworski and Kohli, 1993). A recent study based on panel data indicates that market orientation has a positive impact on firms' both short- and long-run performance (Kumar et al, 2011). The integration of technology and market opportunities is the most important determinant of success for high-tech companies (Hughes, 1990). Research indicates that market orientation is linked to innovativeness and product performance benefits (Atuahene-Gima and Li, 2004). Understanding customers and becoming customer-oriented and market-driven are recognized to be vital for high-tech firms (Iansiti and West, 1997). The survival and development of high-tech companies depend on their ability to integrate technology with market opportunities (Hughes, 1990). The implementation of market orientation is found to be conducive to generating dynamic capabilities, which would be beneficial for high-tech firms to attain superior performance (Zahra, 2008). Notably, there has been the view that the adoption of market orientation makes companies increasingly reliant on customer-orientated sources for new product ideas, resulting in a proliferation of imitative products at the expense of technological breakthrough (Hayes and Abernathy, 1980; Bennett and Cooper, 1981). However, on the whole, the positive tone of market orientation dominates in the literature. Therefore, the following hypothesis can be inferred:

> H1b: The Chinese high-tech companies that pursue market-orientated strategies tend to attain better performance.

Cost Orientation

Porter (1980) popularized the concept of cost leadership (Zahra and Covin, 1993) as one of the generic business strategies. A cost-leadership strategy includes finding ways to reduce production costs, achieve high capacity utilization, offer competitive prices and establish efficient operations in terms of raw materials procurement, internal production process and product distribution (Porter, 1980). It is similar to the approach adopted by Miles and Snow's (1978) defenders (Dess et al, 1997). Chinese firms have been known to be in favor of pursuing cost-based competition both domestically and internationally. They focus on tight cost control through reducing product defects and increasing reliability (Garvin, 1984). Cost reduction is sometimes achieved by minimizing expenditures on innovation (Porter, 1980), limiting firm's ability to develop. Balancing aggressive innovation and operational excellence is a challenge and the key to a high-tech company's survival (Foster, 2000). Many cost-incurring activities such as innovation, risk taking and environmental scanning and monitoring may be seen as detrimental to a cost-oriented strategy (Dess, Lumpkin and Covin, 1997). Conceptually, in one industry, there can only be one cost leader, and thus other cost-orientated firms would be stuck in the middle, with resultant disappointing performance. Thus, we can hypothesize:

> H1c: The pursuit of cost orientation by Chinese high-tech firms is negatively linked to their performance.

External Environmental Factors and Strategy

Government

The survival and development of Chinese high-tech firms are dependent upon how they deal with environmental uncertainties and dysfunctional competition as well as on the degree of support from governmental institutions to alleviate their resource and managerial problems (Li et al, 2001). In an institutional environment with dysfunctional competition, where there is a lack of an effective legal framework to protect intellectual property rights, competitors can engage in widespread opportunistic and unlawful acts (Li et al, 2001). In China, to obtain necessary resources, senior managers have to make an effort to establish and maintain good relations with key officials (Shenkar, 1991) and favorably gain access to strategic industries (Davies and Walters, 2004). Various governmental agencies intertwine and have important and complex impacts on firms' strategy formulation and daily operations, whether consciously or unconsciously (Li et al, 2006). The Chinese government protects China's strategic industries, including high-tech sectors (Luo and Park, 2001), and this would affect the strategy formation of Chinese firms and confer on them a competitive advantage over foreign companies. Thus, the following hypotheses can be developed:

> H2: Government has a positive effect on firms' strategies in the context of China

Uncertainty

Unpredictability and heterogeneity are regarded as the core elements of uncertainty (Dess et al, 1997). The current business environment has witnessed the increasing trend of technological uncertainty (Clark, 1989). The increasing number of strategic alliances and the unpredictability of rivals' activities require executives in technology-intensive firms to adjust their strategies dramatically and appropriately (Bettis and Hitt, 1995). To cope with environmental uncertainty firms should adapt to market changes, seek market opportunities and use improved technologies to satisfy existing opportunities or create new ones (Luo and Peng, 1999). Cost-oriented strategy puts emphasis on short-term profitability and budget controls in order to keep costs down (Miller, 1988). While a consensus about innovation may deal with production processes and some complex and unstructured problems to make costs lower, such activity is still costly and avoided by companies who apply cost efficiency strategy (Miller, 1986). Under uncertain environmental conditions, high-tech firms would be more actively seeking market opportunities and utilizing existing or newly developed technological capabilities to pursue these opportunities, and are less likely to focus on cost-orientated strategy. Therefore, we can hypothesize:

> H4a: Technology-strategy integration is positively associated with environment uncertainty;
> H4b: Market orientation is positively related to environmental uncertainty;
> H4c: Cost orientation is negatively associated with environmental uncertainty.

Rapid Change

Technological change is fast, pervasive and unpredictable, resulting in increased risk and uncertainty, whilst predictability decreases (Bettis and Hitt, 1995). Industry dynamics or changes in high-tech industry involve the high rate of product obsolescence, frequent changes in technology and in the prices of suppliers and short product lifecycle (Miller, 1988). The rate of application of new knowledge is accelerating, the period between innovations is decreasing and technology fusion is taking place across and within industries (Song and Montoya-Weiss, 2001). Technological change increases or decreases the possibility of a firm's survival and development, depending on the benefits of technological change versus the hazards of entering a niche occupied by more technologically advanced organizations (Barnett, 1990). Akgun et al (2004) conclude that

rapid changes in customer preferences and technological development, along with readily available information, force firms to develop new products faster and better. A dynamic environment provides several opportunities for firms to explore and exploit markets based on experiential knowledge (March, 1991). In a turbulent environment, firms can boost the chances of success by investing in and developing a customer base (Chakravarthy, 1997). A highly dynamic environment makes it difficult for firms to choose from well-developed alternatives and requires them to adopt proactive approaches to dealing with it (Venkatraman, 1989). Rapid change increases the cost and difficulty in collecting, analyzing and integrating information (Atuahene-Gima and Li, 2004) and makes it difficult for firms to rely on reducing costs and prices, encouraging them to actively innovate, experiment and explore. Therefore, we can derive the following hypotheses:

H5a: Technology-strategy integration is positively associated with rapid change.
H5b: Market orientation is positively linked with rapid change.
H5c: Cost orientation is negatively related with rapid change.

Internal Environmental Factors and Strategy

Techno-culture

Organizational culture is defined as "the pattern of shared values and beliefs that help individuals understand organizational functioning and thus provide them with the norms of behavior in the organization" (Deshpande and Webster, 1989). It is one of the most important characteristics of successful high-tech firms (Riolli-Saltzman and Luthans, 2001). Effective leadership is crucial for a firm to survive and develop in the marketplace (Akgun, Lynn and Byrne, 2004) and is irreplaceable as a factor in the successful development of high-tech firms (McDougall and Robinson, 1990). In addition, high-tech firm managers should understand the fundamentals of their technologies as well as their limits and potentials (Maidique and Hayes, 1984). In traditional industries organizational culture is found to be positively linked to firms' performance (Jassawalla and Sashittal, 2002). In the marketing literature, corporate culture has been identified as a major factor influencing market orientation positively (Deshpande, Farley and Webster, 1993) and can foster creative, innovative and initiative-taking behaviors in high-tech firms, leading to new product performance to satisfy customers better than their competitors (Jassawalla and Sashittal, 2002). In this study, an organizational culture that is manifested by shared values and beliefs developed through leadership that lead to the commitment to the excellence of innovation and R&D activities, team work, people and technological- competence development is defined as a technology culture or 'techno-culture'. A firm's techno-culture is closely associated with firms' strategy through the node of leadership. Therefore, the following can be hypothesized:

H3: Techno-culture has a positive impact on high-tech firms' strategies.

METHODOLOGY

The survey research method is deemed as appropriate in this study as it is suitable to test hypotheses, model building and the description of population (Czaja and Blair, 1996, p.4), focusing on contemporary events in general, but not to control behavioral events (Yin, 2003). It is designed to "discover facts about a population", "find evidence about some of the likely causes of people's behavior or attitudes" (Buckingham and Saunders 2004: p13). A questionnaire was designed based on an extensive literature review and was pretested on 15 senior managers. To ensure validity in a cross-cultural setting, the method of back-translation was used to translate the questionnaire (Brislin, 1970).

In China, there are 54 national high-tech science parks, which host major Chinese high-tech companies. Three of these parks located in Beijing, Tianjin and Shenyang were chosen for the distribution of

questionnaire, because (1) they ranked among top five in China and (2) the senior management of these parks agreed to assist in distributing the questionnaire. The questionnaire was posted to CEOs or general managers of 350 Chinese high-tech companies randomly chosen in the three parks. 126 completed questionnaires were received, with a response rate of 36%. This sampling process is comparable to a study on marketing high-tech products (Gardner et al, 1999). Telephone calls to 60 of the responding companies verified the direct participation of their top executives in providing data for this study. The industrial categories of the sample companies fall into five groups, namely electronic information (40%), new energy and new materials (19%), integrated optical-mechanical and electric products (17%), new pharmaceuticals and bioengineering (8%) and others (16%). Of the sample companies, 42% were small and the rest were medium-sized (28%) and large (30%) ones.

Table 1. Results of Factor Analysis of Environmental and Organizational Variables

Techno-culture		Government		Uncertainty		Change	
Items	Loadings	Items	Loadings	Items	Loadings	Items	Loadings
Guidelines for R&D	0.84	Supported for funding	0.86	Rival imitation	0.75	Rapid growth	0.73
Executive Experiences	0.79	Guidelines	0.84	Global rivalry	0.74	Tough competition	0.70
Tech Priority	0.76	Information services	0.78	Potential new entry	0.67	Short life cycle	0.59
Decision procedures	0.76	*Guanxi*	0.74	Market unpredictability	0.66	Tech change	0.58
Visions & cooperation	0.70						
Information	0.58						
Cronbach's alpha	0.84	Cronbach's alpha	0.85	Cronbach's alpha	0.70	Cronbach's alpha	0.62

Table 2. Results of Factor Analysis of Strategy Variables

Integration		Cost-orientation		Market-orientation	
Items	Loadings	Items	Loadings	Items	Loadings
Incentives for R&D	0.79	Cost linkage to strategic objectives	0.93	Planning for long-term	0.91
R&D to sales ratio	0.76	Competing on cost	0.88	Clearly long-term objectives	0.90
Upgrading technology	0.65	Cost advantage in supplies	0.80	Functional coordination	0.56
Role of engineers in strategy	0.65	Applying technology to reduce cost	0.54	Marketing research	0.50
Tech training	0.63				
Investment in technology for strategy	0.61				
Technology defined in strategy	0.57				
Cronbach's alpha	0.82	Cronbach's alpha	0.82	Cronbach's alpha	0.77

All variables in the questionnaire were measured on a 5-point scale. The SPSS statistical package was used to perform data analyses, including factor analysis and regression analysis. A factor analysis of influencing variables has generated the constructs of Techno-culture, Government, Uncertainty and Change, as shown in Table 1. The Cronbach's alpha coefficient was applied to check the reliability of the four different scales. Nunnally (1978) suggests that a value exceeding the recommended standard of 0.7 indicates a good result; a value of at least 0.6 is considered desirable and acceptable (Homburg et al, 1999). Technology Culture, Government Support and Environmental Uncertainty have good internal consistency, with Cronbach's

alpha coefficients of .84, .85, and .70 respectively. The coefficient of Change is .62, making it reluctantly acceptable.

In the factor analysis of strategy variables, three factors emerged: Technology-strategy Integration (α=0.82), Cost Orientation (α=0.82) and Market Orientation (α=0.77), as displayed in Table 2. A factor analysis of performance variables has generated two factors: Financial Performance (α=0.88) and Operational Performance (α =0.90), as exhibited in Table 3.

Table 3. Results of Factor Analysis of Performance Variables

Operational Performance		Financial Performance	
Items	Loadings	Items	Loadings
Change in competitive position vs. industry average	0.88	Change in profitability vs. industry average	0.85
Market share growth changes	0.85	Net return on investment changes	0.80
Change in market share growth vs. industry average	0.84	Profitability changes	0.80
Competitive position changes	0.83	Change in net return on investment	0.79
Productivity changes	0.78	Technology investment changes	0.75
Change in productivity vs. industry average	0.76	Change in technology investment vs. industry average	0.74
Cronbach's alpha	0.90	Cronbach's alpha	0.88

RESULTS AND DISCUSSION

Strategy and Performance

Table 4 presents the results of multiple regression analysis of strategy and performance factors. As seen in the table, technology-strategy integration was highly correlated with both financial performance (β = 0.429; $p < 0.01$) and operational performance (β = 0.407, $p < 0.01$), indicating that H1a was supported. This suggests that this strategy made a substantial contribution to explaining high-tech firms' performance and confirms the time-honored doctrine that a high level of technology-strategy integration results in enhanced performance in the context of China's high-tech industry.

Table 4. Results of Regression Analysis of Strategy and Performance

Independent Variables	Financial Performance			Operational Performance		
	B	β	sr^2	B	β	sr^2
Integration	0.45***	0.43	0.14	0.42***	0.41	0.13
Cost Orientation	-0.18**	-0.18	0.03	-0.15*	-0.16	0.02
Market Orientation	0.19*	0.16	0.02	0.22**	0.19	0.03
R^2	0.25			0.25		
Overall F	12.63			12.58		
p	0.00			0.00		

***$p < .01$ [a] Unique variability = .19; shared variability = .05   N = 120
**$p < .05$ [b] Unique variability = .18; shared variability = .06
*$p < .10$

As shown in Table 4, H1b was supported in that Market Orientation was positively related to both Financial ($\beta = 0.163$, $p < 0.10$) and Operational Performance ($\beta = 0.193$, $p < 0.05$). This is consistent with findings in the West, indicating that when high-tech firms apply their technologies to satisfy market requirements, they tend to achieve enhanced performance. It is suggested that Chinese high-tech firms should pay more attention to the importance of market orientation in order to have a better chance of surviving and prospering.

Table 4 shows that H1c was marginally supported, as Cost Orientation was significantly and negatively correlated with Financial Performance ($\beta=-0.21$; $p<0.05$). The pursuit of cost orientation tends to be associated with a vicious cycle: when a firm performs badly, it would start to cut costs and exercise tight cost control, which further limit the firm's ability to recover and grow. When business is deteriorating, firms should find ways to be more proactive, innovative and market-driven in order to turnaround and stage a comeback.

Table 5. Results of Regression Analysis of Strategy and Influential Factors

Independent Variables	Strategy Factors								
	Integration			Cost Orientation			Market Orientation		
	B	β	sr^2	B	β	sr^2	B	β	sr^2
Techno-culture	0.67***	0.62	0.37	0.22**	0.19	0.04	0.62***	0.64	0.40
Government	0.35**	0.37	0.14	0.45***	0.46	0.21	0.15**	0.18	0.03
Uncertainty	0.07	0.07		0.04	0.04		-0.12*	-0.14	0.02
Change	0.12*	0.13	0.01	-0.12	-0.11		0.08	0.10	
R^2	0.53[a]			0.27[b]			0.48[c]		
Overall F	31.97			10.47			25.97		
p	0.00			0.00			0.00		

***$p < .01$ [a] Unique variability = .52; shared variability = .003   N = 120
**$p < .05$ [b] Unique variability = .24; shared variability = .024
*$p < .10$ [c] Unique variability = .45; shared variability = .024

Strategy and Influencing Factors

Table 5 displays the results of regression analysis with the influencing factors Government, Techno-culture, Uncertainty and Change) as independent variables and strategy as the dependent variable. As can be seen in the table, H2 was supported in that Government was positively and significantly related to Integration ($\beta = 0.369$, $p < 0.01$), Cost Orientation ($\beta = 0.455$, $p < 0.01$) and Market Orientation ($\beta = 0.175$, $p < 0.05$). It is interesting to note that despite significantly influencing all strategies, the government had the strongest impact on cost-orientated firms which tended to underperform and the least effect on market-oriented firms. This suggests that the Chinese government gives more support for those that are underperforming or at a developing stage than those that are already firmly established in the marketplace.

Table 5 shows that Techno-culture was positively and strongly related to Integration ($\beta=0.62$; $p<0.01$) and Market Orientation ($\beta=0.64$; $p<0.01$) and marginally associated with Cost Orientation ($\beta=0.19$; $p<0.1$) respectively, indicating that H3 was supported. These results suggest that in high-tech firms, Techno- culture is a necessary condition for firms to pursue their intended strategies. However, the culture does have a much stronger effect on Integration and Market Orientation. Given the positive impact of Integration and Market Orientation on performance, it appears paramount that high-tech firms should focus on cultivating a technology culture to attain a competitive advantage.

As seen in Table 5, H4a, H4b and H4c were all rejected, as Uncertainty was insignificantly associated with Integration and Cost Orientation, but marginally and negatively related to Market Orientation ($\beta=-0.14$; $p<0.1$). The tendency for Uncertainty to be negatively linked to Market Orientation suggests that with the environmental uncertainty, firms are likely to withhold their efforts costs) to carry out marketing research and

initiatives. Table 5 further denotes that H5a was marginally supported as Change had a marginal correlation with Integration ($\beta=0.13$; $p<0.1$). This positive association suggests that in a highly dynamic industry, firms are more likely to resort to leading their technological development by strategy. H5b and H5c were rejected since Change was insignificantly related to Cost Orientation and Market Orientation.

CONCLUSIONS

This study examined the performance implications of Chinese high-tech firms' strategic patterns, with the following concluding results:

Chinese high-tech companies with a high level of technology-strategy integration perform significantly better both financially and operationally. A technology-strategy integrator clearly defines the role of technology in its business strategy; links its investment in technology to the need to implement its business strategy; continuously upgrades its products or services; provides an incentive scheme for employees' innovative initiatives with a high ratio of R&D spending to sales; and emphasizes the input of engineers into firms' strategy formulation.

In the context of China's high-tech industry, firms pursuing a market orientation tend to outperform their competitors. A market orientated firm clearly defines its long-term strategic objectives, develops a marketing plan, carries out marketing research and coordinates different departments or functions to satisfy customer requirements. A significant number of Chinese high-tech firms pursue a cost orientated strategy, which tends to be negatively associated with performance. The tendency can reflect the fact that when a firm underperforms, it is more likely to go for a cost orientation, resulting in a vicious cycle: underperforming – cutting costs and controlling spending – further deterioration.

The Chinese government has been an important factor strongly influencing the strategies of Chinese high-tech firms as well as their performance. Many successful Chinese high-tech firms view a technology culture as a competitive strength or resource, which is positively related with firms' competitive strategies as well as performance. It appears that China's task environment (uncertainty and rapid change) has little impact on firms' strategies, except that under the uncertain environment, firms become less market orientated.

This study suggests that in high-tech industry a firm's investment in technology should be linked to the implementation of its business strategy to achieve a competitive edge. The process of strategy formulation in a high-tech firm should have inputs from both marketing and engineering, while marketing input should be based on the research –based understanding of market requirements and trends. To keep up competitiveness, firms should cultivate an innovative organizational culture and incentivize staff to be creative. Given limited technological and financial resources within Chinese high-tech firms, organizational culture proves to be an effective 'soft power' to gain competitiveness in the fiercely competitive marketplace. When businesses become stagnating or declining, instead of curtailing investment, firms should actively seek for investment opportunities.

This study indicates that the Chinese economy still bears the legacy of the past planned economic system, in which the government had been a key player in businesses. To compete or cooperate with Chinese high-tech firms in China, multinationals must take the government factor into consideration. The insignificant effect of the task environment contrasts the strong impact of the institutional environment in China, and the latter may be the factor that weakens the former. This suggests that when entering or operating in China's high-tech industry, MNCs should pay close attention to the role of the Chinese government as an influencer or gatekeeper and make sure that they compete at a level playing field. When large projects are involved, it is often necessary and effective for politicians in MNCs' home countries to support their business development in China.

Further research may examine the impact of other institutional factors, such as normative and cultural-cognitive elements, and different task environmental constructs on strategy-performance associations in

China's high-tech industry. In terms of the limitation of this study, a relatively small sample size may cause heterogeneity problems and restrict the choice of methodologies.

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BORDER-AREA TOURISM AND INTERNATIONAL ATTRACTIONS: BENEFIT DIMENSIONS AND SEGMENTS

Kenneth R. Lord, Michael O. Mensah, and Sanjay Putrevu

ABSTRACT

This research identifies areas of economic, experiential and logistical enhancement that will lead to increased visits to and expenditures at international attractions by border-area tourists. Dimensions shown to be salient to these cross-border travellers' decisions include value (the combined consideration of price and quality issues), informational and experiential (relevant media exposure and the affective, service and variety elements of the travel experience), and practical considerations associated with the border crossing (traffic and customs enforcement). Two benefit segments emerge (value and experiential). Value appears to have a ceiling effect when it comes to investments in value delivery for cross-border visitors. However, value-based strategies may be the most efficient route to attracting those of this large segment who are not yet satisfied with this aspect of cross-border travel. The Experiential segment, though smaller, is highly susceptible to improvements in communication, service, variety, and the affective aspects of the foreign-travel experience.

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INTRODUCTION

The purpose of this paper is to explore the factors that will keep those on whom international tourist attractions rely for the greater share of their revenue coming back for more. Based on a survey of consumers in the North American border region that is home to one of the world's top natural attractions – Niagara Falls – it attempts to identify areas of economic, experiential and logistical enhancement that will lead to increased visits to and expenditures at tourist venues. Whether such an effort is of value or merely foolhardy, given Wilkinson's (2009) assertion that "predicting the future of tourism is akin to predicting the future of a 'mess,'" we will leave to our readers to determine.

Statistically and anecdotally, evidence of the challenges confronting tourism managers abounds. In the United States, the number of tourist arrivals declined 20 percent, or more than 10 million, in the early years following the 9/11 attack, and did not again reach the 2000 level of more than 51 million until 2007 (NationMaster.com). By 2009, tourist travel to the United States was again down – 6.3 percent from the prior year (ITA 2010). In neighboring Canada, tourist arrivals fell 15 percent between 2002 and 2008, showing declines each year except from 2003 to 2004 (NationMaster.com). Even South Africa, which, with the early growing pains of the post-apartheid era behind it, had experienced modest to substantial growth in tourist arrivals most years in the first decade of this century (NationMaster.com), was feeling the effect of the global economic downturn as this decade began. Cape Town Routes Unlimited (CTRU) reported "a reluctance on the part of hard hit consumers to travel long distances" (Weekend Post 2010). As a consequence, the Garden Route, "long hailed as the tourism mecca of the country," experienced a dearth of international visitors and "was not among the top performers … when it came to attracting international tourists last year." Such results are hardly unique to North America and South Africa.

Does the fall-off of long-distance tourism need to spell financial catastrophe for attractions relying on international tourism revenues? A glimpse at where the bulk of those revenues come from, even in more prosperous economic times, suggests it may not. Xu, Yuan, Gomez and Fridgen (1997) compared short-distance (within 250 miles or about 400 kilometers), medium-distance (251 to 500 miles or approximately 400 to 800 kilometers) and long-distance travelers (more than 500 miles or 800 kilometers) to attractions in the border state of Michigan in Midwestern United States. They found that "frequent or repeat travelers are more likely to be those who reside within a 500 mile radius from a travel destination than those who reside some distance from the destination" (p. 103). The South African experience appears to be similar; the CTRU indicated that "91% of visitors to the Garden Route and Kelin Karoo were domestic travelers," with 60% coming "from within the Western Cape" (Weekend Post 2010). In border regions, findings have been similar. Lord, Putrevu and Shi (2005), for example, reported that the perceived attractiveness of cross-border consumption declined as the distance the consumer needed to travel to reach the border increased. Keum (2010) found empirical support that the gravity-model premise that "trade flows between two countries are … inversely affected by the distance between the partners" applies to international tourism, with the elasticity of distance surpassing that of other variables in explaining the inbound travel flow of international tourists to South Korea.

Clearly a key to the economic success of international tourist attractions is to induce repeat visits from their most regular patrons who, in good and bad times, come disproportionately from short and medium distances away. When such travel requires the crossing of a national border (the focus of this research), the challenge for tourism managers seeking to lure consumers from the neighboring country to their attractions takes on some unique and interesting dynamics, including such factors as the novelty (which may arouse both pleasure and apprehension) of the "foreign" experience and the inconvenience and potential cost of the border crossing itself (due to traffic, the possible need to convert currency and the ramifications of fluctuating relative currency valuations, customs enforcement, etc).

While prior research has delved into marketing strategies that can effectively reach the long-haul international tourism market (e.g., Riege and Perry 2000), comparable assessment of the approaches needed to attract the important short-haul segment to attractions in border markets is needed. This research attempts to fill that gap by identifying dimensions that are salient to these border-area travelers' decisions to patronize

such attractions and benefit segments associated with those dimensions, and then proposing marketing strategies of relevance to the segments.

CROSS-BORDER TOURISM INFLUENCES

A growing body of literature has addressed the variables that motivate consumers to cross national borders for varying types of consumption. In an early study in this area, Leimgruber (1988) reported the influence of ability, willingness and freedom to cross the border, contrast between neighboring and home countries, and awareness of travel and consumption opportunities. Others have pointed to the effect of economic variables such as transfer costs, profit margins, taxation, exchange rates and prices (Timothy 1999; Ferris 2000; Webber 2001; Dwyer, Forsyth and Rao 2002; Lord, Putrevu, Shi and Deniz 2002). Non-price strategic factors under the control of tourism managers have also been shown to help or hinder the attraction of foreign consumers, such as hours of operation, atmosphere, service, variety, marketing promotions, and the quality of and affective pleasure provided by the tourist experience (Lewis 1990; Sullivan and Kang 1990; Van der Velde 2000; Lord, Putrevu and Shi 2008).

In the domain of tourism marketing, researchers have explored the impact of some economic, affective, psychographic and cultural variables on vacationing practices. Studies have shown that economic factors are a significant determinant of long-run tourism demand (Webber 2001; Dwyer, Forsyth and Rao 2002) and that the existence of a formal border decreases the amount of travel between countries (Smith and Xie 2003). Researchers have found that such affective constructs as venturesomeness (Plog 2002) and risk-taking (Pizam, Jeong, Reichel, Van Boemmel, Lusson, Steynberg, State-Costache, Volo, Kroesbacher, Kucerova and Montmany 2004) influence the choice of vacation destination and activities. Letho, O'Leary and Morrison (2002) found that psychographic variables relating to benefits sought, destination-attribute preferences and travel philosophies explained British travelers' long-haul destination choices. Modeling long-haul inbound tourism to Madrid, Garin-Munoz (2004) found per-capita income of the tourists' home countries, the price of goods in Spain relative to the cost of living in each origin country, and a "trend" variable capturing "changes in tastes" and "variables such as level of education of the population, leisure time availability, expenditures in advertising and marketing, etc." (p. 300) to be significant determinants. Scholars have also suggested that cultural orientation plays a role in influencing tourist perceptions and behavior (Reisinger and Turner 1999; Crotts 2004; Lord, Putrevu and Shi 2008).

RESEARCH PROPOSITIONS

The influences revealed in the studies noted above emerged from the examination of a variety of cross-border consumption experiences (e.g., shopping, vacationing, dining). They do not speak directly to the purpose of this paper which, as noted earlier, is to identify strategies that will generate repeat tourist traffic to international tourist attractions by consumers living short to medium distances away, but they have the potential to inform this research. The potential influence of an array of variables will be considered, including economic considerations (price, exchange rate, tax savings), perceived quality of the attraction itself and of services experienced in visiting it, information exposure (advertisements and media coverage), the fun or novelty of the "foreign" experience, and border-crossing issues (traffic and customs enforcement). Of particular interest in this research are the questions of whether distinct benefit segments can be identified, how these potential motivators relate to the relative appeal of attractions in an adjacent country (rather than the consumer's domestic market) and the anticipated future frequency of such visits. Given the exploratory nature of this research, expectations are stated as research propositions rather than formal hypotheses:

1. Improvements in the following areas will enhance the appeal and the frequency of visits to attractions in adjacent countries for consumers living in border areas:
    a. Economic conditions (e.g., lower prices, more favorable exchange rates, tax breaks);

      b.   Quality of attractions and associated services;

      c.   Information exposure (e.g., targeted advertising, media coverage);

      d.   Affective allure of the "foreign" experience (e.g., enhancements to the novelty and "fun" factor);

      e.   Border-crossing experience (e.g., better traffic management, expedited and stress-free customs enforcement).

2.   Consumers can be categorized into distinct psychographic segments based on the extent to which they report that improvements in the above variables would increase their visits to attractions in the host country.

METHOD

A test of the above propositions requires the collection of data from inhabitants of a border region with attractions that are at least partially dependent for their economic success on attracting visits from the neighboring country. The Niagara Frontier region that connects western New York in the United States with southern Ontario in Canada was selected for this purpose. It is an area with multiple tourist attractions, large and small, the dominant one being Niagara Falls which is on the border and visible from either side, although a complete view of the "Horseshoe" requires visitors to cross into Canada. Others touted by Ontario tourism officials include Marineland, the Butterfly Conservatory, the Skylon Tower and Waves Indoor Waterpark, all in close proximity to the Rainbow Bridge that crosses the Niagara River to connect the two Niagara Falls communities (New York and Ontario), and Old Fort Erie, the Ridgeway Battlefield Site (War of 1812), the Friendship Festival and Safari Niagara, which are accessed by and near to the Peace Bridge connecting Buffalo, New York with Fort Erie, Ontario.

Consumers living on the U.S. side of the border participated in a survey about their cross-border-travel experiences, purposes, perceptions, satisfaction and intention. Screening ensured that all respondents had crossed the border into Canada at least once during the time they had lived in the region. (Most living in the area do so at least occasionally.) Students who had market-research training collected data from a judgment sample of 489 consumers, designed to tap the demographic heterogeneity that exists in the population. Respondents were approached in their homes and workplaces. Resource constraints rendered a judgment sample more practical than attempting to generate a probability sample and the exploratory nature of the study justified such an approach. The use of marketing-research students to collect data fulfilled the dual purpose of expediting the data-collection process at minimal cost and providing students with hands-on experience in the market-research process.

The proposition-relevant dependent variables were measured as follows: relative appeal of the neighboring country – "The country with the most to offer in tourist attractions is: Canada [1] … United States [7]"; anticipated future frequency – "How often do you expect to visit attractions on the other side of the border during the next year: [1] not at all … [7] more than twice a week." The following scale measured the potential influence of each of the variables identified in the proposition: "Improvement in this area would: make no difference in visits to attractions in Canada [1] … substantially increase my visits to attractions in Canada [7]." The variables thus measured were: price; exchange rate; tax savings; quality and variety of attractions; helpful, friendly service; advertisements from across the border; media coverage; the fun or novelty of traveling in Canada; degree of border-point customs enforcement; and amount of traffic at the border crossing. Respondents also indicated the travel time required to reach the Canadian border from their homes (less than ½ hour [1] … more than 3 hours [7]" and their household size, gender, age and income.

Sample characteristics reflected a reasonable level of heterogeneity: 45% male and 55% female, all adult age groups included from 18 through retirement years, mean number of household residents 3.36. Respondents lived at varying distances from the border (less than ½ hour away to more than 3 hours), the median category being ½ to 1 hour away and the mean falling between that category and 1 to 1½ hours.

RESULTS

Sample means and standard deviations for the influence variables are depicted in Table 1. Across the sample as a whole, responses indicate that surveyed consumers' visits to attractions across the border would be influenced most strongly by improvements in price, exchange rate, attraction quality and tax savings (means greater than 4 on the 7-point scale). Wielding moderate influence (means between 3 and 4) were improvements in attraction variety, service, border traffic, the pleasure and novelty of the foreign travel experience, and customs enforcement. Of somewhat less perceived influence (means between 2 and 3) were advertising and media coverage.

Table 1: Means of Influence Variables

Variable	Mean	Standard Deviation
Price	5.10	2.01
Exchange rate	5.07	1.98
Attraction quality	4.35	2.08
Tax Savings	4.27	2.22
Attraction variety	3.73	2.05
Helpful, friendly service	3.51	2.10
Border traffic	3.42	2.08
Fun & novelty of foreign travel	3.37	2.08
Customs enforcement	3.01	2.04
Advertising	2.86	1.87
Media coverage	2.39	1.76

While these results are somewhat informative, one should be wary of over-interpreting results at this level. The range of response for each variable took in the full scale (1 to 7) and, as can be seen in Table 1, several of the variables have sizable standard deviations given the number of scale points and the often modest differences in means. Given the observed variance, it becomes particularly important to search for patterns within the results that might reveal the existence of distinct benefit segments.

To identify patterns of influence which could be used for further analysis, both to identify benefit segments and to assess the relationship of the influence variables with the dependent constructs identified earlier, principal-components analysis was used. With three eigenvalues greater than one, a three-factor solution was examined. The three factors were interpretable, aligning reasonably with the dimensions revealed in some of the studies discussed previously, and accounted for 63% of the variance in the data. Varimax rotation yielded the factor loadings shown in Table 2.

Table 2. Rotated Factor Loadings

Variable	Value	Informational & Experiential	Border Crossing
Eigenvalue:	2.65	2.09	1.34
Exchange rate	.82	.07	.19
Price	.82	.14	.17
Tax savings	.73	.17	.21
Attraction quality	.71	.36	-.02
Advertising	.12	.79	.21
Media coverage	-.05	.77	.25
Fun/novelty of foreign travel	.21	.61	-.04
Helpful, friendly service	.40	.61	.04
Attraction variety	.46	.60	-.04
Customs enforcement	.15	.06	.85
Border traffic	.19	.18	.80

The first factor combines high loadings on the economic variables (exchange rate, price and tax savings) with one for attraction quality, suggesting that respondents were considering not only the costs but also the quality of the experience in arriving at an estimate of value of the experience of visiting attractions across the border, and is thus labeled "Value." This factor relates to the "economic conditions" and "quality of attraction" elements of Proposition 1a and 1b. The second combines the informational constructs (advertising and media coverage, related to Proposition 1c) with experiential dimensions of visits to foreign attractions (fun and novelty of the foreign travel experience – Proposition 1d, helpful and friendly service – Proposition 1b, attraction variety – Proposition 1d) and has been named "Informational & Experiential." The two border-crossing variables (customs enforcement and border traffic – Proposition 1e) have the only high loadings on the third factor, "Border Crossing."

Use of the uncorrelated factor scores for the Value, Informational & Experiential, and Border Crossing factors provide a viable basis for the unbiased estimation of the relationship between the influence variables and the two dependent variables (relative appeal of the neighboring country as a travel destination and intended future frequency of visits to attractions there). Table 3 depicts the results of the two regression models, both of which were significant but explained only a modest amount of variance in the dependent variables.

Table 3. Regression Results

Dependent Variable	F	*Adj.* R^2	*Value*	Independent Variables	
				Inform./Exper.	Border Crossing
Relative Appeal	2.66[a]	.10	-.10[a]	.02	-.08
Expected Frequency	3.15[a]	.13	.09[a]	.10[a]	-.03

a. $p < .05$

For the border-area consumers in this sample, the relationship between the influence of improvements in the value (cost and quality) of the experience of visiting attractions in the neighboring country and current perception of that country's appeal for such a purpose is negative. This suggests that those who would most be influenced to visit such attractions through improvements in the value offering are those whose current perception of the Canadian market's attractiveness is relatively low. The other two factors were unrelated to the relative appeal of the neighboring country. Two of the three factors were significantly related to the anticipated frequency of future visits to the neighboring country's attractions: Value and Informational/Experiential. In other words, the very consumers whose behavior would most be influenced by improvements in those two areas are the ones on whom the foreign attractions disproportionately rely for their revenue, since they project the highest frequency of future visits. It is worth noting that improvements in the border-crossing experience, though seemingly of modest influence in the mean scores for those constructs, were not significantly associated with either the perceived appeal of the neighboring country or the level of anticipated future visits. These results provide tentative evidence consistent with points a, b, c and d of the first research proposition, but not for e.

K-means cluster analysis was applied to establish whether distinct benefit segments could be identified based on the responses to the influence items. Results are shown in Table 4. Nearly two thirds of the sample constituted a "Value" segment, with cluster centers revealing that they were somewhat more strongly influenced by value than the sample as a whole (cluster center of +0.05) but were less responsive than average to improvements in the informational/experiential and border-crossing dimensions (cluster centers of -0.57 and -0.25, respectively). The remaining respondents (labeled an "Experiential" segment), just over a third of the sample, were less susceptible than average to value (-0.09) but more responsive to the other two factors (+1.00 and +0.44) for informational/experiential and border crossing.

Table 4. Cluster Analysis Results

Factor	Experiential	Value
Value	-.09	.05
Informational/Experiential	1.00	-.57
Border Crossing	.44	-.25
Percent of Sample	36.4	63.6

(Solution converged in nine iterations)

With a single exception (exchange rates), the two segments had significant differences in mean raw scores for the influence variables (t values > 3.0, p < .005) in the direction consistent with the cluster centers. Further analysis found no significant differences between the two segments in gender, age, income or distance from the border. There was a significant difference between the two segments in size of household, with the experiential segment being significantly larger than the value segment (means of 3.59 and 3.25, respectively, t = 2.40, p < .05). These results are consistent with the second research proposition and reveal that these segments are defined almost exclusively on a psychographic (benefits) basis, with little in the way of demographic differences to distinguish them.

DISCUSSION

The earlier review of literature summarized the impact of an array of economic, affective, psychographic and cultural variables on international tourism. Most such research has not differentiated between short-, medium- and long-haul travel. The few studies that have examined the factors that influence short-haul, cross-border consumption in border markets have tended to focus on such activities as dining, shopping, or vacationing in a general sense. Little attention has been paid in publicly accessible research to the short- and medium-haul cross-border segment that is vital to the revenue-generating potential of border-area tourist attractions. This study, while informed by the research that has gone before, sought to close that gap by identifying what variables might enhance the patronage of short- and medium-distance travelers at international tourist attractions in neighboring countries, revealing distinct segments, and considering strategic implications of those findings.

Three dimensions of influence were identified: Value, Informational & Experiential, and Border Crossing. However, further analysis suggested that when it comes to perceived appeal of foreign markets to consumers and their intention to visit their attractions they fall into two distinct benefit segments: Value and Experiential.

The Value segment is about twice as large as the Experiential group. The observed negative relationship between foreign-country appeal and the feeling that improvements in the value (cost and quality) of the visits to attractions in neighboring countries may imply the existence of a ceiling effect when it comes to investments in value delivery for visitors from across the border. Those who find in the present state a high level of appeal in the neighboring country as a destination for such experiences are unlikely to have that perception increased by such strategies. However, the results of this study would suggest that value-based strategies may be the most efficient route to attracting those of this large segment who are not yet satisfied with this aspect of cross-border travel. The Experiential segment, though smaller than the Value, is highly susceptible to improvements in communication, service, variety, and the affective aspects of the foreign-travel experience.

Practically, this suggests that no single strategy will appeal to all and tourism managers will need to devote attention and resources to both value and experiential dimensions of their offerings to cross-border travelers. The task is complicated by the lack of demographic discriminators between the two segments, but carefully crafted value offerings and communication strategies should enable either type consumer to self-select those of most relevance and appeal, with the consequence being a higher level of satisfaction and patronage among those short- and medium-distance travelers on whom attractions must rely for repeat patronage and revenue in the current economic climate.

A review of a Canadian Tourism Commission report based on research conducted in 2007 provides a useful check on both the face validity and the strategic value of the findings of this study. In a random telephone omnibus survey, researchers collected data from 2000 United States residents classified as international pleasure travelers and coming from border states (e.g., Maine, New York, Minnesota), mid-haul states (e.g., Connecticut, Illinois, Wyoming), and long-haul states (e.g., Alabama, Texas, California). Consistent with the argument made and evidence presented in this study, the Commission reported that while there is "no difference between the Border and Mid-Haul markets when it comes to interest in Canada, … those in the Border market are more likely to actually make a visit (49%)" (p. 4).

This focus of this research on understanding and developing appropriate market responses to consumer interest in attractions in border markets finds support in the Commission's observations "Niagara Falls is the individual destination that draws the most attention from US travelers, with 6 in 10 saying they want to visit this popular landmark while in Canada" (p. 5) and that "Visiting Canada's unique attractions and landmarks" was cited as a key motivation for visiting that country by 83% of respondents (78% in border states, 84% in mid-haul states, 85% in long-haul states – pp. 24, 26). The report's author used the 6% to 7% drop in those most interested in visiting such attractions as one looks from the border-area travelers to those from mid- and long-haul states as a basis for a recommendation that would seem to contradict a major premise of this study (that attractions need and should seek repeat patronage from border-area consumers): "Marketing initiatives targeted at the Border region need to promote second tier destinations and more specialized experiences in order to draw travelers back" since "the vast majority of travelers in the Border states have been to Canada before and have likely already visited the major tourist attractions" (p. 25). Given that, even among border-area consumers, "Visiting Canada's unique attractions and landmarks" is ranked second highest in importance among 12 motivators examined (only "Enjoying Canada's beautiful landscapes/unspoiled nature" came in higher, at 83%), it would seem that for the promoters of such attractions to write off these consumers, whom the Commission's survey found to be the most "likely to actually make a visit" on the grounds that they have "already visited" would be a risky and revenue-losing strategy. Rather, they would be better served by applying the results of this study to find ways of appealing to these border-area travelers for repeat patronage.

The Commission investigated key motivations for (p. 26) and perceived barriers to (p. 32) visiting Canada. Barriers consistent with the Value factor obtained in this study included "Too expensive/can't afford it" (50% of border-area respondents), "High gas prices" (55%) and "Unfavorable exchange rate" (48%). Corresponding to the Informational & Experiential factor were the Commission's findings that 72% of border-area respondents were motivated by "Learning or exploring something new" and "Discovering unique Canadian culture" (54%), with barriers to such travel including "Nothing to do there / lacks activities I enjoy doing" (58%), "Too boring/not exciting" (56%), "No unique history or culture" (44%). The report's author concluded that there "is clearly an immediate need to stir up excitement and buzz around Canada travel, accelerate the acceptance of the new brand, and enhance perceptions of Canada's products in the US" (p. 29). Border-crossing issues were observed in the percentage of border-area consumers put off by "Delays and hassles at airports and borders" (39%) and "Passport or entry visa requirements" (35%).

From a logistic regression, the Commission's report concluded that "travelers in the Border states are more likely to visit, but so are men and those with children at home (suggesting that Canada may be viewed as a good family destination)" (p. 38). While this study did not find a significant difference between genders, its finding that larger families are more likely to fall into the experiential than the value segment helps to inform the strategies contemplated by the Canadian research, indicating that this important segment may better be reached through a promotional focus on the unique, engaging and variable aspects of the travel experience than through manipulations of the economic value proposition.

The Commission report indicated that U.S. consumers have the lowest perception of "destination value" of "any market" (p. 42) and argued that an attempt "to convey a better sense of the value of the Canadian travel experience and to drive home the message of quality … is extremely critical to keep Americans traveling to Canada at a time when travelers are facing higher travel costs as a result of the devalued dollar" (p. 42). As noted earlier, this study's results imply that value-based strategies may be an efficient way to attract those of the Value segment whose perceptions of Canadian attractions are not yet as

high as tourism officials from that country might wish (roughly half of border-area consumers, according to the Canadian survey).

In short, this study agrees in key dimensions and findings with the results obtained in the Canadian research. However, the distinct factors and segments that emerge in this study afford an opportunity for more precise targeting of the value- and experience-based strategies that the Canadian report proposed. Similar benefits may also arise in other border markets.

The above prescriptions need to be couched in a recognition of the limitation that this research is exploratory. Results and recommendations stem from measures of self-reported perceptions and expectations of a non-probability sample in a single border region (and one where the dominant attraction – Niagara Falls – could potentially skew the responses that might emerge in a region with lesser-known sites). While they are "real" consumers with a profile that bears sufficient resemblance to the population to lend some credibility to the results, the ultimate validation and generalization of these findings awaits further research with probability samples in multiple border regions and with actual behavioral observations. It is hoped that this research provides a useful stepping stone for scholars and tourism managers interested in keeping the "attraction" in international tourist attractions.

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FINANCIAL SERVICES & ECONOMIC DEVELOPMENT

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ABSTRACT

Studies of the relationship between economic development and financial service activities typically focus on banking or insurance alone with the majority of the literature focused on the banking-development relationship (Hussels, Ward and Zurbruegg, 2005). We consider the possibility that both banking and insurance influence economic development and that the relationship is recursive. We conclude that the focus on banking in the literature is justified; we find a significant positive relationship between economic development and banking penetration but we do not find convincing support for such a relationship between development and insurance penetration.

INTRODUCTION

"Schumpeter argued that the services provided by Financial Intermediaries—mobilizing savings, evaluating projects, managing risk, monitoring managers, and facilitating transactions—are essential for technological innovation and economic development" (King and Levine, 1999, p. 717). While most studies of Schumpeter's hypothesis focus on banking services, this study considers the activities of both bank and insurance financial intermediaries.

The level of financial activity is determined, in part, by the level of economic activity within a geographic area. On the other hand, because many types of financial service companies amass and invest

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capital, economic activity may be determined, in part, by the level of banking and insurance activity in the area (Bernanke, 2006). The first hypothesis is well researched for both banking and insurance; regarding insurance, the second hypothesis is less studied. The hypothesized link of the financial sector and economic growth is outlined in the box to the right by Levine (1997). Most of the functions identified are provided by both banks and insurance companies. Financial intermediaries channel savings into investment. However, in contrast with commercial banks, which specialize in collecting short-term deposits and extending short-term credit, a longer-term view is taken by many contractual savings institutions, including "long-tail" insurers [1]. More specific to the insurance-development link, the reduction in the financial risk facing an insured company is itself a stimulus to business activity (Skipper, 1998).

Market Frictions
- Information costs
- Transaction costs

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Financial Markets and intermediaries

↓

Financial functions
- Mobilize savings
- Allocate resources
- Exert corporate control
- Facilitate risk management
- Ease trading of goods, services & contracts

↓

Channels to growth
- Capital accumulation
- Technological innovation

↓

Growth

Insurance researchers cite the first UNCTAD conference in 1964 as one of the earliest references to the hypothesis of a positive relationship between insurance industry activity and economic growth: "a sound national insurance and reinsurance market is an essential characteristic of economic growth" (Skipper, 1998; Beck and Webb, 2002; Outreville, 1990; and others).

Like banking-specific studies, insurance-specific studies find a positive relationship between insurance activity and the level of economic activity (Kugler and Ofoghi, 2005); similar results are obtained for "density:" insurance premiums per capita (Browne and Kim, 1993; Browne et al., 2000); and for "penetration:" insurance premiums per dollar of GDP (Outreville, 1990; Pearson, 2002). However, most of these insurance studies are based on samples of the OECD countries, a set of countries that is among the World's most developed; thus the ability to generalize the results may be questioned. This study relies on a larger statistically representative sample, and considers banking and insurance simultaneously. Finally, our model specification differs from existing insurance-development studies in that, while existing studies focus on the level of insurance activity as a dependent variable and consider a measure of economic condition as explanatory, we explicitly consider the recursive nature of the hypotheses.

BACKGROUND AND LITERATURE REVIEW

This section describes the typical methods used in cross-country development comparisons. Economic development, a sustained increase a nation's standard of living, is normally accomplished by a combination of increasing physical and human capital and improving technology (Deardorff, 2006). Economic development is typically measured in terms of jobs and income (GDP), but it also includes improvements in human development, education, health, choice, and environmental sustainability (Stern, 1989). To facilitate discussion and policy regarding cross country comparisons, each year the United Nations produces the Human Development Index (HDI), a relative measure used to determine and indicate whether a country is developed, developing, or underdeveloped [2]. Using 2005 data, we find that the HDI measure is moderately correlated

with per capita GDP (0.664) but not with the growth rate of GDP (-0.054), two other common proxies for economic development.

Table 1 provides evidence supporting the notion that HDI, rather than per capita GDP or GDP growth, is a better measure of economic condition; 63 countries were ranked as high (a HDI value between 0.8 and 1.000), 83 were medium (0.5 to 0.799), and 31 were low (under 0.5); another 22 countries were listed as unavailable [3]. In high-HDI countries, 99 percent of the populations have access to an improved water source, 39 percentage points higher than for low-HDI countries. Even more extreme are the differences in the percent of the population with access to improved sanitation facilities in high-HDI versus low-HDI countries.

Table 1: Development measure comparisons, by HDI rank

	% Access to improved		GDP		Shadow %
	Water	Sanitation	Per Capita 2005	% Growth 2000-05	Of GDP
Low-HDI	60	35	470	13.42	45.3
Medium-HDI	81	63	1,937	13.99	40.6
High-HDI	99	97	23,799	12.52	23.7

Though per capita GDP increases with increasing HDI, suggesting that both are good development proxies, the average shadow economy of low-HDI countries is twice that of high-HDI countries suggests that reliance on published per capita GDP values introduces measurement bias. We conclude that HDI, reflecting both reported GDP values and quality of life information, is a better measure of economic development [4].

The existing literature is criticized as being subject to misspecification errors for the lack of a geographic reference and the failure to use representative samples. The geographic clustering of development levels suggests that location is an important determinant of business success. Location affects transport costs, location-dependent climate affects include disease burdens, and both affect productivity. Particularly disadvantaged regions are located far from coasts and ocean-navigable rivers, thus requiring high transportation costs, or contain tropical regions, which bear a heavy burden of disease (Gallup, Sachs & Mellinger, 1999). Landes (1999) suggests that the simultaneous effect of heat on human activity and on the longevity of disease bearing insects in tropical regions conspire to lower life expectancy and productivity. Sachs (2001) provides support for the view that location, specifically a tropical location, is a key identifier of underdevelopment: "In 1820, GNP per capita in the tropical regions was roughly 70 percent of GNP in the temperate-zone. By 1992, GNP per capita in the tropical regions was 25 percent of that in the temperate-zone." Regardless of the cause, no insurance study considers location as an explanatory variable in development studies. Consistent with the geographic/disease issues, this study identifies the frequency of AIDS infection as a health impediment to economic development. In some countries, HIV infection rates reach one in four members of the population. It is difficult to consider the relative influences of such variables as urbanization, culture, wealth, and financial sophistication when a country is increasingly filled with orphanages. Many African countries, with a coincidence of tropical climate, political instability, and high HIV infection rates, faces many development challenges reflected in low HDI values, and are often omitted from existing insurance development studies.

Most insurance/economic development studies are based on small and questionably representative samples. Table 2 presents sample HDI information of the economic development portions of nine important studies [5]. The studies range in size from 9 to 56 of 176 relevant countries. The samples are typically small and unrepresentative; in some studies samples are solely of the countries of the Organization for Economic Cooperation and Development (OECD) (e.g., Browne, et al., 2000; Ward & Zurbruegg, 2000). The 30 member countries of the OECD are among the most developed in the world. Only three OECD countries are below 0.9; two in the 0.8 to 0.9 range and one in the 0.7 to 0.8 range. Thus the ability to generalize from economic development studies based on such samples is questioned. The final column, which compares the mean HDI of the sample in a paper with the overall mean for all countries, demonstrates that the existing works are not representative. The table also reports the values for all countries in the world for which the UN provides the measure. Only one study has a sample mean that is not significantly different from that of the 176 identified countries of the World. Only Outreville's (1990, 1996) one-year samples are statistically similar to the population of countries.

Table 2. T-test for the difference between the means of HDI values
for samples of various researches and the world average value

X_i	Mean	s_x	Countries [6]	t-test
Beenstock, Dickinson & Khajuria 1988	0.8634	0.1028	38	7.15
Outreville 1990	0.6473	0.1661	53	-2.40
Browne & Kim 1993	0.8448	0.1519	44	5.06
Outreville 1996	0.6845	0.1603	44	-0.95
Browne, Chung & Frees 2000	0.9306	0.0478	25	13.40
Ward & Zurbruegg 2000	0.9463	0.0055	9	17.50
Park, Borde & Choi 2002	0.8634	0.1028	38	7.15
Esho et al 2004	0.8258	0.1371	44	4.68
Arena 2006	0.8209	0.1448	54	4.63
X_T: All UN measured countries	0.7107	0.1775	176	

Beyond questions concerning the representativeness of the samples used in the cited research, the conclusion that economic development is associated with insurance is based on the interpretation of a positive coefficient for a variable intended as a measure of national wealth. However, there is a lack of consistency across the studies in the measure of national wealth and we also question the appropriateness of the model specification. Beenstock et al. (BDK, 1988) regress property liability insurance premiums on per capita GNP, described as a measure of wealth, and the inverse loss ratio, described as a measure of price. Excepting Arena (2006), each of the other papers described follows the BDK approach: regressing the level of premiums on a set of variables, at least one of which is considered a measure of economic development, and interpreting a significant coefficient as evidence of a causal relationship. Arena (2006) adopts the more traditional economic development approach in setting the measure of economic development as the dependent variable and the level of insurance activity as a dependent variable; this is an approach we follow but we consider the economic development and insurance demand processes to be simultaneously determined.

LITERATURE REVIEW: INSURANCE ISSUES

This section develops the causal relationships hypothesized in the literature. Delays obtaining up-to-date and consistent industry-specific statistical information for many less developed countries cause us to rely on 2005, one of the last years of available data. In 2005, world insurance premiums totaled $3.4 trillion US dollars; 42 percent of which is non-life insurance [7]. The top five insurance countries account for 68 percent of total insurance premiums; each of these countries is among the most developed according to the UN HDI measure. The two most populated countries of the world, China and India, account for only 3 percent of world insurance premiums; both fall into the medium development range measured by the UN HDI. Studies of the relation between insurance and economic development investigate the link by focusing on the demand relationship: the effect of a country's development level on the level of insurance activity. The factors influencing the demand for insurance by utility maximizing individuals and wealth maximizing corporations are similar: income, wealth, the price of insurance, the purchaser's degree of risk aversion, and the probability of loss (Browne et al. 2000). The literature relating national economic development and insurance activity concentrates on these factors and relatively few other cross-country control factors.

Total national insurance premium is the measure of insurance activity employed by some in descriptive insurance researches of the insurance-economic development link (Skipper, 1997). Other empiricists argue that cross country analyses require a size adjustment (Browne & Kim, 1993; Outreville, 1990); the primary adjustment methods are to divide premiums by population (insurance density) or by the level of GDP (insurance penetration). The insurance penetration measure is favored for multinational analysis because the division creates a measure that is free from cross-country currency variations. Regardless of the measure of insurance activity used, studies show a positive relationship between insurance premium activity and the level of economic activity. Kugler and Ofoghi (2005) show a relationship between economic activity and the level of net written premiums. Similar results are obtained for insurance density by Browne and Kim (1993), Browne et al. (2000), and others, and for insurance penetration by Outreville (1990) and Pearson

(2002). None of these studies consider the effect of banking on development and, for data availability reasons, these studies tend to concentrate on OECD countries or on particular sectors of the insurance industry such as life-health or property-liability.

Insurance researchers struggle with the identification of measures for some basic concepts required in the demand equation, including measures of insurance quantity and price. For example, given that an insurance contract can be for any amount of money, simply counting the number of contracts does not provide a reliable measure of insurance activity. Similarly, using the sum of dollars spent on insurance products, or total premiums, is imperfect because the sum of insurance premiums is total revenue, the product of price and quantity, rather than quantity alone. The notion that the possibility of loss motivates insurance purchases lead researchers to create a variable based on observed losses – the inverse of the ratio of losses realized to premiums earned in a time period – as a measure of insurance quantity (Doherty, 1981). For property-liability studies, the various price proxies used in the literature include the inverse loss ratio (Beenstock et al., 1988; and Outreville, 1990), and the market share held by foreign insurers (Browne et al., 2000). He suggested that the higher the market share held by the foreign insurers, the higher the price of the insurance. For life insurance studies, price proxies used include the ratio of life insurance premiums to the amount of life insurance in force; the ratio is interpreted as the cost per dollar of coverage (Browne and Kim, 1993). In addition to measurement problems, few measures are consistently available across countries.

Income, a flow concept, and wealth, a stock concept, are sometimes interchangeably described in the insurance literature. The various studies inconsistently refer to GNP, GDP, or GNI as wealth (Outreville, 1990 and 1996; Park et al., 2002) or as income (Beenstock et al., 1988; Browne and Kim, 1993; Browne et al., 2000). Browne et al. use a World Bank wealth measure that includes human and social wealth estimates as well as estimates of the value of a country's natural (land and crops) and mineral resources. They relied on 1995 values, the then latest data for this index, an index that has since been criticized for ignoring human capital. In different specifications considered by Beenstock et al., the authors were unable to consistently demonstrate that insurance penetration was related to GNP regardless of how the measure is characterized. Browne et al. (2000) and others find a positive relationship between insurance activity and per capita GDP while Pearson (2002) suggests that the relationship between the level of insurance penetration (insurance premium/GDP) and per capita GDP (PC-GDP) is S-shaped. Though he did not test the hypothesis, Pearson argues that insurance penetration is insensitive to PC-GDP increases in countries with low or high income levels. At low levels, the value of personal financial assets is low and relatively high administrative costs may require insurance prices that make the purchase irrational. In countries with high levels of income, self insurance and an awareness of alternative risk management approaches limit the rate of increase of insurance penetration. For countries in the middle ranges, as PC-GDP increases, the level of insurance penetration increases, yielding an S shaped curve.

Risk averse individuals purchase insurance. The reasons one might expect average risk attitudes to differ across countries include cultural differences (Browne et al., 1993; Browne and Kim, 2000). Proxies for a country's risk attitude include education, religion, and indexes of culture. Some hypothesize that higher levels of education are associated with higher risk aversion and a greater awareness of the necessity of insurance. Browne et al. use the level of tertiary education but do not find the variable to be significant. Others suggest that countries with a significant Muslim population have different attitudes toward risk or the appropriateness of using insurance to address risk (Park et al., 2002; Browne and Kim, 1993; Outreville, 1996). Park et al. suggest that these various cultural proxies are better measured by Hofstede's set of cultural indexes [8]. The indexes measure a mix of cultural influences that, separately, have been considered by many; these include a "power-distance" index, an index of individualism, a masculinity index, an index of uncertainty avoidance, and an index of long-term orientation. Of the five measures, the most relevant for a study of risk and development is likely to be the uncertainty avoidance index (UAI). The UAI rates a society's tolerance for uncertainty and ambiguity. It purports to measure the population of a country's relative comfort level in unstructured situations. Higher values suggest greater comfort with uncertainty and a lower desire for insurance. This is consistent with the 2.1 percent insurance penetration value for the country with the highest UAI, Greece, and the 4.21 insurance penetration value for the country with the lowest UAI, Singapore. Park, Borde, and Choi (2002) rely on Hofstede despite criticisms of the validity of the approach; the primary criticism is that it is not reasonable to summarize cross-country cultural nuances by a single index (Trompenaars & Hampden-Turner, 1998). Unfortunately, Hofstede index values are rarely available for the least developed countries.

Risk attitudes are also influenced by the actual probability of loss in different countries. Many have tried to correct for a possible variation in risk across countries by identifying measures, such as life expectancy at birth, that are important determinants of life insurance demand (Browne et al., 1993, 2000). Similarly, high property-liability risk is associated with urbanization. The notion that corporate activity and hence insurable property varies with the political stability in a country also has been studied (Park, Borde & Choi, 2002).

In addition, Outreville (1990) argues that the demand for insurance increases with the population's level of comfort using advanced financial tools. He measures the financial sophistication of a country by the ratio of M2 to GDP. Because M2 includes non-cash financial tools, the higher levels of M2-to-GDP suggest a comfort level with non-cash financial tools. Therefore, insurance activity, in addition to banking activity, should be positively related to this measure of financial acumen. Empirical evidence is inconsistent (Levine, 1997; Outreville, 1990, 1996) in part because relevant information is not available for many countries and, when the data is available, it is not reasonable to consistently interpret the values across countries. For example, the ratio of M2 to GDP in 2002 is almost 300 times GDP for some countries. In these countries, the high ratio is more a reflection of inflation than financial sophistication; in others, such as Switzerland, the high ratio is a reflection of the export of financial services. For these inconsistent but reasonable causes, we do not expect this financial depth influence to be a reliable measure of financial sophistication.

SAMPLE AND MODEL

This study synthesizes the existing literature and extends the literature by considering the determination of insurance demand and economic development as simultaneous processes; seemingly unrelated regression is used to estimate the following models:

InsurancePenetration = *f*[Income, Wealth, RiskLevel, RiskAppetite, FinSophist]   (1)
EcoDev(HDI) = *f*[Savings(Insurance, Banking), Productivity, Governance, Location]   (2)

Insurance demand is measured by insurance penetration, total insurance revenues as a portion of GDP because, unlike studies that identify the level of premiums as the variable of interest, insurance penetration is a ratio of two monetary values and is therefore insensitive to measurement issues caused by exchange rate changes. The study also provides a significant improvement in sample design: it is larger and more representative of the world economic development condition than the existing literature.

This study is based on a sample of 101 countries. The US Central Intelligence Agency identifies 235 separate political entities. Of the CIA-identified political entities, 33 are excluded because they are parts of a joint governmental unit (e.g., China includes entities earlier identified as the People's Republic (Mainland), Hong Kong, and Macau). Of the remaining 202, 50 are countries of population less than one million. Comparing development in China and India with, for example, Tuvalu (population of 11,810) is not reasonable so an arbitrary minimum size is selected, picking one million because it is about the size of many US cities [9]. Another 59 entities are dropped for lack of data on the variables used to identify economic condition or insurance activity: HDI data could not be obtained for 7 of the remaining countries and insurance information could not be obtained for another 44 countries, leaving a sample of 101 countries.

Table 3: Sample identification

	Number	Remaining
CIA identified political entities	235	235
Joint governmental units	33	202
Population < 1 million	50	152
No HDI data	7	145
No insurance data	44	101

Life, non-life and total insurance data for most countries are drawn from the annual publications of SwissRe. The SwissRe data is supplemented by information obtained directly from the insurance departments in many countries but obtaining life and non-life breakdowns was not always possible [10]. For the countries considered in this study, the HDI average is 0.7583, showing the sample to be more representative than almost all existing studies of the insurance-development relationship (see Table 2 for mean comparisons). The sample includes 48 countries with an HDI in the 0.8 to 1.0 range (developed), 40 in the 0.5 to 0.79 range (medium) and 13 lower than 0.5 (less developed); a chi-square test shows this to be similar to the distribution of the UN HDI evaluated countries. For the 85 countries where life and non-life information is available, the HDI average and standard deviation, 0.8060 and 0.1255, are not representative of the World development average. For the full sample of 101 countries, Table 4 provides descriptive data for the dependent variables and each of the variables used as a proxy for the factors hypothesized to influence insurance activity and economic development.

Table 4: Sample descriptive statistics

	$\bar{X}$	σ	Min	Max
DEPENDENT VARIABLES				
Total insurance penetration	1.3442	0.6389	0.0139	2.7568
UN Human development index	0.7583	0.1652	0.0371	0.9650
INDEPENDENT VARIABLES				
Life expectancy @ birth	68.4059	12.0749	35.0000	82.0000
Average age (2002)	27.8641	6.6521	16.6000	38.7700
Population % (ages <15 & >64)	36.8146	5.9154	24.8300	53.2200
Urban population (%)	0.4695	0.1332	0.1171	0.6931
Uncertainty Avoidance index	64.1754	19.6184	8.0000	112.0000
Financial depth (M2/GDP)	0.4725	0.3074	0.0675	1.8921
Low income	0.0947	0.1854	0.0000	0.6417
Middle income	0.6981	0.7776	0.0000	2.4852
High income	0.8140	1.3990	0.0000	3.7440
Bank credit to GDP	0.3416	.0.2364	0.0315	0.9324
Population % (ages 15 to 64)	63.1853	5.9154	46.78	75.1700
UN Technology index	23.5864	24.9300	0.1300	100.0000
UN income inequality index	2.3980	1.0305	0.0000	5.1245
Tropical dummy	0.2871	0.4546	0.0000	1.0000
Population % infected with HIV	2.2663	5.2287	0.0080	25.8400

The SwissRe dataset contains life, non-life, and total insurance penetration data for 85 of the 144 countries identified using the first four screens (Table 3). We supplement the SwissRe data with information obtained from an additional 16 countries, bringing the total number of countries considered to 101 [11]. Because for most of these 16 countries only the total insurance premium information is available, total insurance penetration is relied on in this study to avoid using an unrepresentative sample, a criticism of the existing literature.

To assess the effect of general economic condition on the level of insurance activity, we consider the low, middle, high values of GDP as a test of the Pearson S-curve hypothesis; we identify countries with PC GDP in the 25th through 75th percentile, or middle ranges: 904 to 11,197. Because insurance demand is also a function of the level of risk and the population's risk attitude, life expectancy is used as a relative risk proxy though evidence is conflicting (Browne and Kim, 1993; Outreville 1996); we expect a positive relationship between life expectancy and the demand for insurance. The importance of HIV/AIDs in recent decades caused us to consider the degree to which HIV is prevalent in a country, separately from life expectancy. In some countries HIV infection rates are as high as 25 percent.

Rather than considering demand solely an issue of cross-country risk levels, we follow the approach of Park et al. (2002) in the use of Hofstede's uncertainty avoidance index. We expect insurance activity to increase with the UAI. Unfortunately, the index is available for only 85 of the 101 countries sampled for this study. Because the countries for which the index is not available tend to be among the least developed, the

consequence of relying on that variable introduces a bias to the sample. Finally, we test Outreville's (1990, 1996) argument that familiarity with financial instruments increases the likelihood of their use; we include his measure of financial sophistication, or depth, the ratio of M2 to GDP.

Regarding the economic development equation, it is well established that a country's economic health is primarily a function of its savings rate, productivity, and technology and our specification includes proxy variables for each of these concepts (Schumpeter, 1983). Insurance affects development through two of these concepts. Increases in insurance activity, cet. par., increase savings, and increases in insurance coverage reduce business risks, increasing the likelihood of gains in employment and, consequently, productivity.

A central part of our thesis is that savings is correlated with the activities of financial intermediaries, especially banks and insurance companies. For the economic development equation, we measure insurance activity using the insurance penetration instrument from the insurance activity equation and follow Arena (2006) in measuring bank activity by the ratio of domestic credit provided by the banking sector to GDP, a variable whose data is provided by the World Bank Development Indicators.

Production is a function of both the quantity of productive resources and the technology used by those resources. We measure the quantity of labor in the workforce (16 to 65) as one significant productive resource. The level of technological advancement is measured by an index constructed by the World Travel and Tourism Council (2001) as the equal combination of three quantities: (1) the number of computers with active Internet Protocol addresses connected to the Internet per 10,000 people, (2) the number of telephone lines connecting a customer's equipment to the public switched telephone network per 10,000 people, and (3) the number of people using portable telephones and subscribing to mobile telephone service per 10,000 people. A higher value for the index indicates a greater degree of technological advancement [12]. Finally, we consider the fact that some hypothesize that regulatory influences negatively affect development. Finally, addressing the location influences identified by Landes (1999) and Sachs (2001), we consider three measures. First is the percent of the population living in urban areas because it is widely understood that more urban societies tend to have higher per capita productivity than more agrarian societies. Second, for the reasons mentioned above we include the Koppen-Geiger climate index, a binary variable that identifies predominately tropical countries [13]. The increase in HIV/AIDS infections and the coincidence that the highest infection rates are located in Africa, a predominately tropical continent, leads us to separately consider the rate of HIV/AIDS infection as an alternative measure; though HIV is correlated with tropical locations, it does not solely identify tropical countries.

Many of the variables assembled are collinear but the degree of correlation is not large; exceptions include technology and political instability, which are highly correlated with almost all other variables. The collinearity is addressed by our estimation method. The simultaneous estimation of correlated equations via SUR yields more efficient estimates than does the separate application of OLS to each equation (Binkley, 1982). Binkley (p. 890) states further that "the use of SUR is likely to be especially fruitful when multicollinearity problems are encountered." The following section reports the results of empirical estimates of the insurance demand and economic development equations for both OLS and SUR models.

RESULTS

Empirical results are generally, but not always consistent with the theories outlined but a surprise is the relative development effect of insurance versus banking. Table 5 presents the results of both OLS and SUR equation estimates; the consistency of the results does not support the notion that the equations are simultaneously determined. Interpretation of the coefficients in the insurance penetration equations requires care and is best understood with reference to a familiar tax analogy. The average tax rate is the ratio of tax to income; similarly, insurance penetration is the ratio of insurance premiums to GDP (national income). If the tax rate measure is regressed against income, the resulting coefficient is either positive, zero or negative. A positive value suggests a progressive tax system, a negative suggests a regressive system and a zero suggests a proportional system. For each of these results, even a negative coefficient, it is possible that taxes increase as

income increases; the coefficient says how fast the tax increases. Similarly, in the case of insurance penetration, a positive coefficient suggests that as GDP rises, insurance increases faster than does GDP. A zero coefficient means the ratio of insurance penetration to GDP does not vary as GDP rises, both rise in the same proportion. A negative finding could mean either that insurance purchases increase slower than income increases or that – perversely and unlikely – insurance purchases decrease as income increases.

The insurance equation is consistent with expectations: insurance activity increases with risk probability proxies. Tests of the relationship between insurance activity and life expectancy revealed a significant negative relationship. The negative sign is consistent with the data of Browne and Kim (1990) but their estimate was insignificant and Outreville (1996) found a positive relationship. Speculating that it is the current average age of the population, in a life-cycle sense, rather than the expected age, that drives life insurance purchases, we obtained the average age of the population for each country as well as the percent of the population in the "dependency" age categories, the under 15 and over 64 age groups [14]. We expected and found a positive relationship for both of these life-cycle variables. Insurance activity tends to increase with the average age of the population and with the percentage of the population that might be characterized as in a dependant age class. The life expectancy variable remains negative but combining these population characteristics and estimated coefficients in a Monte Carlo simulation, we find that the probability of a positive net effect of life expectancy, mean age, and dependency ratio is 99.7 percent [15].

Consistent with Park, Borde and Choi (2002), differences in risk attitudes, measured by Hofstede's UAI, are not found to be significant. This result may reflect measurement issues because the construction of the UAI is not sufficiently known to offer criticism or praise. The financial depth measure, which also serves as a proxy for financial sophistication, is also insignificant. Finally, unlike Pearson's expectation that the relationship between income and insurance penetration is positive in mid-income levels and insignificant otherwise, we find a significant positive relationship for all but the lowest income level countries.

Table 5: OLS & SUR estimates for Total Insurance Penetration & Human Development Index

	Exp. Sign	OLS β	P(β=0)	SUR β	P(β=0)
Insurance Activity					
Constant		-0.0545	0.6436	-0.5211	0.6208
Risk Prob. (Life Expectancy)	+	-0.0149	0.0334	-0.0147	0.0320
Risk prob. (Mean age)	+	0.0510	0.0022	0.0536	0.0005
Risk prob. (Dependant pop. %)	+	0.0305	0.0614	0.0310	0.0631
Risk Aversion (UAI)	-	-0.0039	0.1348	-0.0039	0.1196
Financial Depth	+	0.4428	0.0134	0.4403	0.0127
Income/Wealth (low income)	0/+	0.1359	0.3796	0.1413	0.2819
Income/Wealth (mid income)	+	0.1846	0.0666	0.1875	0.0398
Income/Wealth (high income)	0/+	0.2612	0.0002	0.2575	0.0001
Adjusted R^2		0.5155		0.5214	
Economic Development					
Constant		0.0039	0.9660	-0.0475	0.5740
Insurance (TIP)	+	0.0018	0.8930	0.0040	0.7640
Banking	+	0.0649	0.0918	0.0795	0.0332
Labor quantity (work age pop. %)	+	0.0096	0.0001	0.0097	0.0001
Technology	+	0.0017	0.0001	0.0017	0.0001
Governance (income inequality)	+	0.0129	0.0206	0.0136	0.0156
Location (Urban)	+	0.2354	0.0001	0.2492	0.0001
Location (Tropical)	-	-0.0534	0.0003	-0.0560	0.0002
Location (HIV/AIDS infected)	-	-0.0063	0.0001	-0.0061	0.0001
Adjusted R^2		0.8043		0.8979	
System R^2					0.8453

We find that the relationship between country development levels and increases in insurance penetration is not significantly different from zero; as noted above this is akin to finding a proportional relationship between the variables. Banking activity, measured by the level of credit offered by banks to the private sector, consistent with expectations, has a significant positive impact on development. The sign of the basic development control variables, labor and technology, is consistent with expectations. Development increases with improvements in either the percent of the population in traditional work ages or improvements in technology. We find that the higher the percentage of the population in the 15 to 64 year old range, the higher the UN HDI measure of development. Consistent with the literature, we find that tropical climates are negatively correlated with development (Gallup, Sachs & Mellinger, 1999; Sachs, 2001). In addition, despite the fact that many of these tropical locations have among the highest HIV/AIDS infection rates in the world, both tropical location and HIV infection rates have a significant negative effect on development. And, consistent with the arguments of Freeman and Lindauer (1999) and the empirical findings of Gottschalk and Smeeding (1997), we find that development increases with higher levels of income inequality.

DISCUSSION AND CONCLUSION

Many believe that a sound insurance market is essential for strong economic growth. This argument is predicated on the hypothesis that insurance stimulates economic development in stabilizing capital markets, facilitating trade and commerce, promoting loss mitigation, and encouraging efficient capital allocation (Skipper and Barfield, 2001; Webb, Grace, and Skipper, 2002). The insurance industry contributes to the measurement of economic growth by virtue of the premiums it collects, the investments it undertakes, and by stimulating economic activity by reducing the average risk of a country's residents (Hussels et al., 2005). Insurance also helps stimulate an economy through prudent investing of premiums collected and, like any financial intermediary, by providing the country's investors with access to diversified investment portfolios (Ward & Zurbruegg, 2000). Insurance studies of the relationship with economic development do not consider the correlated activities of other financial intermediaries. Similarly, many studies that focus on banking conclude that financial intermediaries play a positive role in development, without separating the effect of the two sectors. The findings of this study do not confirm speculations about the relative effect of insurance on economic development. The results suggest that the impact of banking on development is greater. Insurance activity is found to vary directly with GDP but it is difficult to identify the causal direction. The results suggest skepticism should be used interpreting the existing literature.

END NOTES

[1]   Long-tail infers that a relatively long time elapses between the receipt of a premium and the payment of a claim by the insurance company; e.g., life insurance is long-tail whereas auto insurance is short-tail.

[2]   The HDI formula equally weights (i) general health care, measured by life expectancy at birth; (ii) education, measured by the adult literacy rate (with two-thirds weight) and the combined primary, secondary, and tertiary gross enrolment ratio (with one-third weight); and (iii) the country's per capita gross domestic product at purchasing power parity in US dollars. The HDI has been used since 1993 by the United Nations Development Programme. The 2005 report contains a complete list and methodological information about the index construction.

[3]   Information on access to water and sanitation is from the World Bank. Information on the Shadow economy is from Schneider (2006). Unavailable is not always low; e.g., it includes the Vatican, Macao, and Puerto Rico.

[4]   For consistency with earlier work, however, we consider specifications with per-capita GDP as an alternative measure of economic development.

[5]   The nine papers listed in Table 2 are either characteristic or provide a first use of a concept; many other studies provide consistent results (e.g., Theil & Ferguson, 2003; Kugler & Ofoghi, 2005).

[6]   If the number of countries listed in Table 2 is different from the actual sample used in the referenced study, the difference is because a HDI value does not exist for the country (e.g., North Korea) or because the country no longer exists as a separate entity (e.g., East Germany and Hong Kong).

[7]   The source, the Insurance Information Institute (III) *International Insurance Fact Book,* includes health insurance as part of the non-life numbers. Because both life and property insurers offer health insurance in the US, reported percentages for the US based on other information sources may report different life/non-life percentages. The III data does not include information for 12 of the 101 countries assembled for this study.

[8]   Source: www.geert-hofstede.com/geert_hofstede_resources.shtml. The fifth index measures a country's long-term versus short-term orientation; it is sparsely available. The power-distance index measures the likelihood that less powerful members of organizations and institutions (like the family) accept that power is distributed unequally. It suggests that a society's level of inequality is endorsed by the followers as much as by the leaders. Park, Borde and Choi (2002) find that this measure does not explain variations in risk attitudes.

[9]   The 50 countries with a population below 1 million have an aggregate population of 12.7 million, an average of 253,710. The population range is from 903 (Vatican City) to 906 thousand (Fiji).

[10]   SwissRe reports less often for developing countries; this data is assembled by and reported in Nana Addo's thesis (2007) in the St. John's University library (New York). The countries in the sample, and the identification of non-SwissRe countries are available from the authors.

[11]   SwissRe does not distribute information about the other 59 countries with a population larger than 1 million. For these 59 countries, the average HDI value is 0.5475. The UN HDI value is available for 179 countries and its average value is 0.7107. The data for the 16 countries not covered by SwissRe was collected by the authors from a variety of sources. The countries include: Bolivia, Boznia & Herzegovina, Burma (Myanmar), Cameroon, Cote d'Ivorie, Ethiopia, Gabon, Georgia, Ghana, Guinea, Malawi, Mozambique, Senegal, Tanzania, Uganda, and Zambia.

[12]   The   Human   Development   Project: HUhttp://64.78.5.130/dev_indicators/show_info.cfm?index_id=336&data_type=1UH.

[13]   The identification of tropical countries, and other sample source information, is available from the authors.

[14]   The dependency definition is conventional but, as with any arbitrary definition, characterizing under-15 and over-64 as "dependency ages" is wrong for many countries. For example, in Germany, under-20 year olds tend to work part-time and retirement age is 60 while in India, many in the 12 to 15 year ages tend to be working full-time.

[15]   The Monte Carlo simulation assumes that the distribution of each of the variables is normal.

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DECISION TO GROW SUGAR CANES VERSUS COMPETITIVE CROPS: A CASE STUDY OF THAILAND

Kawpong Polyorat

ABSTRACT

Thailand, one of the world's leading sugar producers, has tried to increase its level of sugar production by persuading farmers of competitive crops to grow sugar canes. Therefore, this research seeks to examine sugar cane farmer's decision to grow sugar canes vs. competitive crops (cassava, rubber, and eucalyptus) by examining four independent factors: cane price, competitive crop price, sugar mill support, and community support. Conjoint analysis with data from Thai farmers indicates that the first three factors significantly influence the farmer's choice of crops to grow (sugar canes vs. competitive crop). Research implications and future research directions conclude the study report.

INTRODUCTION

Thailand's economy relies heavily on agriculture and agro-industries. At a global level, Thailand is one of the major exporters of agricultural products (Falvey 2001). Rice, rubber, tapioca, sugar, black tiger prawn, and chicken are among the foremost income generators for the country. A high percentage of its population is connected in one way or another with the production of these agricultural commodities.

Sugar has been recognized as one of the world's most traded commodities. In addition, the sugar exports accounts for more than one quarter of the world's production (Mahadevan 2009). For this internationally important economic sector, Thailand is one of the world's leading sugar producers and exporters (Polyorat and Tenglolai 2009). It has attempted to catch up with more advanced sugar producing countries such as Brazil, South Africa and Australia (Higgins 2006) by trying to increase its level of production.

One approach to increase sugar output is to increase the productivity or the yield of the sugar cane farm without expanding the land for cane growing. A number of innovative techniques (e.g., dual-row cane farming, Polyorat and Tenglolai 2009) have been implemented for this purpose. An option to increase yield per hectare is to expand the land used for growing sugar cane. As most of the arable land in Thailand is already used for crop growing, trying to increase the cane-growing land inevitably means persuading growers of other crops (eg., rubber, cassava, and eucalyptus) to switch to growing canes. For example, rice field may be used for growing canes, instead (Polyorat and Pangrit 2010).

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Sugar and sugar cane industries in Thailand are composed of several related members in the value chain including the growing, harvesting and transport, milling, and marketing sectors (Everingham et al. 2002). In order to enhance the quantity of sugar production through the increase of cane farmland, sugar mills have to collaborate with their major suppliers or cane farmers (Suksawat, Piewthongngam, and Tenglolai 2008) because, in Thailand, sugar canes are the primary raw material in sugar refinery industry. Moreover, most of sugar canes in Thailand are grown by independent farmers, not by the sugar mills as in some other countries. Therefore, sugar mills cannot any longer limit their effort to their mill boundaries but, instead, must rely on their cane farmers' contribution (Suksawat, Piewthongngam, and Tenglolai 2008).

However, the mills' attempt is challenged by the limited amount of sugar canes supplied to sugar mills from farmers. One reason for this is that many farmers choose to grow other competitive crops. An interview with industry experts indicates that cassava, rubber, and eucalyptus are major competitive crops that have received attentions from farmers in the region.

Therefore, to remedy the situation of insufficient cane supply, this research seeks to examine sugar cane farmer's decision to grow sugar canes vs. other competitive crops. Although there could be numerous factors influencing the farmer's decision, a preliminary discussion with a major sugar mill in Thailand suggests four primary influencing factors: cane price, competitive crop price, sugar mill support, and community support.

Cane price and competitive crop price

Crop price reflects a farmer's income. From the perspective of this study, cane price, therefore, represents the income a farmer will earn from growing canes while competitive crop price implies the income forgone or opportunity lost from growing canes. Income is an important factor for cane farmers (Piewthongngam, Mahasuweerachai, and Kannula 2011). In fact, income maximization in said to be a primary motivation for cane farmers (Mahedevan 2009).

Sugar mill support

A cane farmer who is a sugar mill's member is provided with guaranteed market, loan services, productivity improvement program, market information and long-term planning. The offer of important production inputs (e.g., low-interest loan, chemical fertilizer, herbicide, purchasing agreement, and long term planning) is expected to minimize the farmer's risk in growing canes (Piewthongngam, Mahasuweerachai, and Kannula 2011). Although the farmers are likely to prefer the high (vs. low) support from the mill, it remains unclear how important this factor is in comparison with the crop prices. Therefore, the present study attempts to examine the relative importance of mill support versus crop prices so that a sugar mill can decide the extent to which they should allocate their resources for this support.

Community support

An individual's behavior could be subject to interpersonal influence (Bearden, Netemeyer, and Teel 1989). For example, a cane farmer is found to ask for opinions from other farmers in their neighborhood when making a decision to adopt the dual-row farming method (Polyorat and Tenglolai 2009). As the majority could influence the behavior of an individual (Ladwein 2003), the present study attempts to examine if the decision to grow cane versus competitive crops is affected by whether the majority of farmers in their community grow or do not grow canes. Furthermore, in order to better understand the role of opinion leader (Solomon 2007) or a person whose belief, attitudes, and behaviors could influence what other people think,

feel, and do, this study also examines if a community leader's growing canes would impact on a farmer's decision to grow canes.

Hypotheses

Based on the roles of crop prices, mill supports, and interpersonal influences as discussed thus far, the present research endeavors to examine the following four hypotheses which are visually displayed in Figure 1. The results from this study will yield insight regarding how a sugar mill can implement a marketing plan to more effectively persuade farmers to grow canes (cf. Polyorat and Mounmontree 2009).
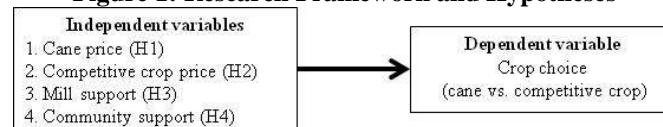
H1: Cane prices influence the decision to grow canes vs. competitive crop.
H2: Competitive crop prices influence the decision to grow canes vs. competitive crop.
H3: Mill supports influence the decision to grow canes vs. competitive crop.
H4: Community supports influences the decision to grow canes vs. competitive crop.

Figure 1: Research Framework and Hypotheses

METHODOLOGY

A conjoint analysis, widely used in the marketing literature, is a form of an analysis of variance which allows the measurement of consumers' preferences for different attributes of a product or service (Carricano and Poujol 2008). The objective is to identify, for instance, the most importance attribute consumers (i.e., "farmers" in the present study) use for decision making when consumers have to tradeoff the more preferred attributes with the less preferred ones in various levels of each attribute. In the present study, the four independent variables (cane price, competitive crop price, mill support, and community support) represent the four product attributes. Cane price, competitive crop price, and mill support have three levels (low, medium, and high). The fourth independent variable- community support- also has three levels but is categorized as "most people in the community do not grow canes," "most people in the community grow canes," and "the community leader grows canes." In the current study, a conjoint analysis with fractional factorial design was used to avoid the respondents' fatigue.

Face-to-face interviews were conducted with 47 farmers. The sample size was comparable to what identified in the agricultural marketing literature (cf., Polyorat et al. 2009). The sample based on purposive sampling was drawn from northeastern provinces which are the major areas for sugar cane production in Thailand. Research participants were first greeted and provided with a basic description of the study. Next, they were asked a series of questions regarding their decision to grow sugar canes versus competitive crops given different combinations of cane price, competitive crop price, mill support, and community support. Finally, participants were thanked and debriefed. They received a small gift as a compensation for their participation.

RESULTS

To test the four hypotheses, a logistic regression model was run where cane price (low, medium, high), competitive crop price (low, medium, high), mill support (low, medium, high), and community (most

people in the community do not grow canes, most people in the community grow canes, the community leader grows canes) are independent variables. The last category of each independent variable is used as the reference point. Crop decision (canes vs. competitive crops) is the dependent variable. The results are displayed in Table 1.

The overall model is significant (χ^2 = 287.66, p < .001). The results for the decision to grow canes versus competitive crops are provided as follows.

Table 1: Logistic regression results

DV: Decision to grow canes vs. competitive crops

Model Chi-Square = 287.66, df=60,p <.001 , -2LL = 226.32, Nagelkerke's R^2 = .28

		Competitive Crops								
		Cassava			Rubber			Eucalyptus		
		Sig	B	Exp(B)	Sig	B	Exp(B)	Sig	B	Exp(B)
Cane price	**Low**	0.00	1.89	6.59	0.00	1.87	6.50	0.00	1.94	6.95
	Medium	0.01	0.57	1.76	0.00	0.63	1.88	0.04	0.77	2.15
	Ref.: High									
Cassava price	**Low**	0.00	-1.54	0.22						
	Medium	0.00	-1.01	0.37						
	Ref.: High									
Rubber price	**Low**				0.00	-1.24	0.29			
	Medium				0.00	-0.86	0.42			
	Ref.: High									
Eucalyptus price	**Low**							0.00	-2.46	0.09
	Medium							0.00	-0.97	0.38
	Ref.: High									
Mill service	**Low**	0.00	0.83	2.29	0.01	0.63	1.88	0.03	0.74	2.10
	Medium	0.15	0.33	1.39	0.25	0.27	1.31	0.97	0.02	1.02
	Ref.: High									
Most people	**Do not grow canes.**	0.08	0.41	1.51	0.08	0.43	1.54	0.53	-0.22	0.80
	Grow canes.	0.99	0.00	1.00	0.92	-0.03	0.98	0.35	-0.34	0.71
	Ref.: Community leader grows canes.									

Cane versus cassava

Regarding the decision to grow sugar cane versus cassava, cane prices are found to influence the decision to grow canes (vs. cassava) as hypothesized in H1. Specifically, farmers tend to choose to grow cassava (vs. cane) when cane prices are either low ($b_{\text{low cane price}} = 1.89$, $p < .001$) or medium ($b_{\text{medium cane price}} = 0.57$, $p < .01$) in comparison with high cane prices.

As hypothesized in H2, cassava prices are found to influence the decision to grow canes (vs. cassava). Specifically, farmers tend to choose to grow canes (vs. cassava) when cassava prices are either low ($b_{\text{low cassava price}} = -1.54$, $p <. 001$) or medium ($b_{\text{medium cassava price}} = -1.01$, $p < .001$) in comparison with high cassava prices.

As hypothesized in H3, mill supports are found to influence the decision to grow canes (vs. cassava). Specifically, farmers tend to choose to grow cassava (vs. cane) when mill supports are low ($b_{\text{low mill support}} = 0.83$, $p < .001$) in comparison with high mill support. There is, however, no difference between medium and high mill supports ($b_{\text{medium mill support}} = 0.33$, $p > .1$).

Contrary to H4, community support is not found to influence the decision to grow canes (vs. cassava). There is no difference between "most people in the community do not grow canes" ($b_{\text{most people in the community do not grow canes}} = 0.41$, $p > .05$) in comparison with "the community leader grows canes. Similarly, there is no difference between "most people in the community grow canes" ($b_{\text{most people in the community grow canes}} = 0.00$, $p > .1$) in comparison with "the community leader grows canes."

Cane versus rubber

Regarding the decision to grow sugar cane versus rubber, cane prices are found to influence the decision to grow canes (vs. rubber) as hypothesized in H1. Specifically, farmers tend to choose to grow rubber (vs. cane) when cane prices are either low ($b_{\text{low cane price}} = 1.87$, $p < .001$) or medium ($b_{\text{medium cane price}} = 0.63$, $p < .001$) in comparison with high cane prices.

As hypothesized in H2, rubber prices are found to influence the decision to grow canes (vs. rubber). Specifically, farmers tend to choose to grow canes (vs. rubber) when rubber prices are either low ($b_{\text{low rubber price}} = -1.24$, $p <. 001$) or medium ($b_{\text{medium rubber price}} = -0.86$, $p < .001$) in comparison with high rubber prices.

As hypothesized in H3, mill supports are found to influence the decision to grow canes (vs. rubber). Specifically, farmers tend to choose to grow rubber (vs. cane) when mill supports are low ($b_{\text{low mill support}} = 0.63$, $p < .01$) in comparison with high mill support. There is, however, no difference between medium and high mill supports ($b_{\text{medium mill support}} = 0.27$, $p > .1$).

Contrary to H4, community support is not found to influence the decision to grow canes (vs. rubber). There is no difference between "most people in the community do not grow canes" ($b_{\text{most people in the community do not grow canes}} = 0.43$, $p > .05$) in comparison with "the community leader grows canes. Similarly, there is no difference between "most people in the community grow canes" ($b_{\text{most people in the community grow canes}} = -0.03$, $p > .1$) in comparison with "the community leader grows canes."

Cane versus eucalyptus

Regarding the decision to grow sugar cane versus eucalyptus, cane prices are found to influence the decision to grow canes (vs. eucalyptus) as hypothesized in H1. Specifically, farmers tend to choose to grow eucalyptus (vs. cane) when cane prices are either low ($b_{\text{low cane price}} = 1.94$, $p < .001$) or medium ($b_{\text{medium cane price}} = 0.77$, $p < .05$) in comparison with high cane prices.

As hypothesized in H2, eucalyptus prices are found to influence the decision to grow canes (vs. eucalyptus). Specifically, farmers tend to choose to grow canes (vs. eucalyptus) when eucalyptus prices are either low ($b_{\text{low eucalyptus price}}$ = -2.46, p <. 001) or medium ($b_{\text{medium eucalyptus price}}$ = -0.97, p < .001) in comparison with high eucalyptus prices.

As hypothesized in H3, mill supports are found to influence the decision to grow canes (vs. eucalyptus). Specifically, farmers tend to choose to grow eucalyptus (vs. cane) when mill supports are low ($b_{\text{low mill support}}$ = 0.74, p < .05) in comparison with high mill support. There is, however, no difference between medium and high mill supports ($b_{\text{medium mill support}}$ = 0.02, p > .1).

Contrary to H4, community support is not found to influence the decision to grow canes (vs. eucalyptus). There is no difference between "most people in the community do not grow canes" ($b_{\text{most people in the community do not grow canes}}$ = -0.22, p >.1) in comparison with "the community leader grows canes. Similarly, there is no difference between "most people in the community grow canes" ($b_{\text{most people in the community grow canes}}$ = -0.34, p >.1) in comparison with "the community leader grows canes."

Additional analysis

As there are some farmers who appear to stick to either canes or a particular competitive crop no matter what levels of cane price, competitive crop price, mill support, or community support are, the logistic regression model is rerun, but this time with these farmers removed from the analysis. The results closely mirror those in the first model where data from all farmers are included both in terms of direction and significance of influence, suggesting the robustness of the findings. The amount of variance explained or R^2, however, is higher in the second model which appears reasonable. The first model is kept for generalizability sake as it includes higher number of farmers.

DISCUSSIONS

Summary

The study results reveal that cane price, competitive crop price, and mill supports significantly influence the decision to grow canes (vs. competitive crops) while community supports do not. The higher cane price and the lower competitive crop price attract farmers to grow canes (as opposed to competitive crops). Similarly, the higher level of mill supports also encourages farmers to grow canes (as opposed to competitive crops). Contrary to expectation, however, community does not have a significant influence on this decision.

Research Implications

Based on the beta coefficients, both cane prices and competitive crop prices have stronger impact than mill supports. Therefore, the crop prices are undoubtedly the most critical factors farmers take into consideration in their selection of crop choices. The findings that prices are the most influential factors could suggest, at least to a certain extent, the external validity of our research as this is also what intuitively perceived by sugar mills and farmers.

The crop prices, nevertheless, are often not the factor under the control of sugar mills. In fact, sugar and sugar cane prices are closely influenced by government regulation and intervention (Mahadevan 2009). As a result, mills may need to turn to "support and service" as strategic tools to encourage farmers to grow canes instead of other competitive crops. In fact, support and service (e.g., loan, pesticide, and fertilizer) have long been considered by a number of mills as strategic tools to attract cane growers.

The results from the conjoint analysis implies the compensatory model of decision making (Carricano and Poujol 2008) where a drawback of one attribute can be compensated or offset by the good point of another attribute of the given product. If this is the case, as sugar mills lack control over market prices of sugar canes and competitive crops, sugar mills, therefore should resort to relationship marketing with farmers. That is, mills may focus on providing several services or supports to each farmer, interacting with each farmer on a regular basis, soliciting farmer's participation, and working on long-term objectives (Michon 2006). However, as the study results indicate no significant impact between the medium versus high level of mill supports, a mill, therefore, may not have to devote all of their resources for this support, but rather make sure that at least some level of supports and services is achieved.

Furthermore, while a sugar mill should continue offering supports and services which are not offered by other competitive crops, a sugar mill must try to make those services be viewed by farmers as not less valued than the differential prices. Word-of-mouth and marketing communication could be used to form or change the present perception, attitude, and satisfaction (Polyorat and Tenglolai 2009).

In addition, a mill may try to provide support in a more innovative way that directly affects livelihood of the farmers' community such as irrigation system, infrastructure, caring for environment, and education of growers' kindred.

Limitations and Avenues for Future Research

The current study has a number of limitations which suggest directions for future research. First, the present study collects data from only one region of Thailand. Future research may replicate the present study in other parts of the country where major sugar cane production is conducted. This revalidation will enhance the understanding of farmer's crop switching behaviors in more diverse geographical locations. In addition, as the results of this study were drawn from survey data alone, future research should employ additional research methods such as in-depth interviews and focused-group interviews in order to gain a better understanding of the relative influences of each independent variable (cf., Polyorat 2011).

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THE CORRUPTION-ECONOMIC GROWTH NEXUS: EVIDENCE FROM FOUR BRIC COUNTRIES BASED ON THE PANEL DATA APPROACH

Yuan-Hong Ho and Chiung-Ju Huang

ABSTRACT

This paper utilizes panel unit root, panel unit cointegration, and panel error correction model techniques to examine the corruption-economic growth nexus in a panel of four BRIC countries (Brazil, Russia, India, and China) over the 1995 to 2009 period. The empirical results show that there is a significant positive relationship between corruption and economic growth in the short run. However, in the long run, corruption is no longer the most important factor that affects economic growth. Instead, foreign direct investment and the degree of economic openness are the key factors that influence a country's economic growth.

INTRODUCTION

Corruption is a global issue faced by all countries, governments, and communities. There is not a single description for corruption as it takes on different shapes accordingly to specific culture, ethnicity, government type and scale, economic development, and public behavior. For example, Transparency International (TI) defines corruption as "the misuse of entrusted power for private benefit," International Monetary Fund (IMF) describes corruption as "the abuse of public authority or trust for private benefit," and the Asian Development Bank (ADB) defines corruption as "the abuse of public or private office for personal gain." Jain (2001) further introduces three types of corruption phenomena that occur in a democratic nation. For example, grand corruption involves corruption among high level executives in government, legislative corruption involves corruption among representatives of the general public, and bureaucratic corruption involves corruption among government officials and staff. Regardless of its type, corruption hinders economic and social development, causes political instability and government inefficiencies, and deteriorates the close bond between a nation and her democratic ideals. In response, both emerging market economies and democratic developed countries have begun to seriously consider the social, political, and economic harm corruption brings, and to invest in resources to prevent and control corruption. Similarly, international organizations have also established various anti-corruption plans and departments for this cause. Among the anti-corruption organizations, the international non-government, global civil society organization, TI, stands out as one of the most influential and well-known entities.

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While the effects of corruption can be clearly observed, they are often hard to quantify. Obtaining accurate information pertaining to corruption in specific nations is difficult, and quantifying the respective damage is less likely. Social and cultural differences, different standards and tolerance towards corruption also contribute to the complexity of formulating a standardized way to quantify corruption. However, several international organizations have attempted to create metrics to evaluate and quantify a nation's corruption. For example, TI created the Corruption Perceptions Index (CPI) and the Global Corruption Barometer (GCB); Business International came up with the Business International Index (BI); Political Risk Services, Inc. designed the International Country Risk Guide Index (ICRG); and World Bank developed the Governance Indicators. The CPI from TI is known for its accuracy and is currently the most frequently used method for measuring corruption. Following the CPI in popularity, is the World Bank's corruption index (Governance Indicators). In this study, Transparency International's CPI is used as the explanatory variable for its empirical study.

Recent global economic activity has been largely dominated by emerging market economies. The performance of Brazil, Russia, India, and China's economic markets have especially stood out among the others and are now known as the BRICs. In fact, Goldman Sachs' 2003 publication, Dreaming with BRICs: The path to 2050 projected that within the next forty years, based on population, productivity and capital, and the conventional economic growth model, the BRICs will have a combined economy larger than that of the G6 or the six major industrialized nations, including the United States, Japan, England, Germany, Italy, and France. In addition, the publication states that by 2050, only the United States and Japan, amongst the old G7, will have economies large enough to compare with those of the BRICs. One of the major distinguishing characteristics that differentiated the BRICs nations with others is their scale. More specifically, each of the BRICs nations has belong to the six nations with highest population (the United States and India being the other two), the seven nations with the largest land mass (Canada, United States, and Australia being the other 3), and the eleven nations with the largest economy (the G7 nations being the other seven). None of the other emerging markets countries, such as the Next-eleven (N-11), which includes Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, The Philippines, South Korea, Turkey, and Vietnam, or the VISTA, which includes Vietnam, Indonesia, South Africa, Turkey, and Argentina, compare in scale with the BRICs.

Table 1 displays the relationship between CPI and both the average global GDP growth rate and the GDP growth rate of the BRICs. The statistics show the BRICs as having higher growth rates than the global average, but a CPI score falling towards the end of the list. The lower CPI score a country gets, the greater degree of corruption it has. This seems to suggest that for the BRICs, there is a short term, positive correlation between corruption and economic growth. However, how might corruption and economic growth relate to each other in the long run? This paper intends to examine both short and long run relationships between economic growth and corruption for the 4 BRICs. By using the panel unit root test, the panel cointegration, and the panel error correction model, we will be able to consider cross-country information, which will yield higher testing power and more accurate estimations that surpass the results of using traditional time series approaches.

LITERATURE REVIEW

Due to growing concern over corruption's harmful effects on economic and social development, numerous studies have been devoted to explore the relationship between economic growth and corruption. Determining how corruption affects economic and social development is more than an intellectual exercise because the results may potentially contribute towards the discovery of multiple solutions to the problem corruption.

Recent research has shown that corruption negatively impacts a nation's competitiveness by not only decreasing financial investments, economic growth, and government expenditures on education and health, but also leading to imbalanced expenditures, misguided market incentives and poorly allocated national resources (e.g., Tanzi 1998; Rose-Ackerman 1999, 2008; Aidt, 2009; Hodge et Al., 2009). Some empirical results suggest that corruption plays a central role in attempts to understand economic growth, with many now agreeing corruption severely constraints economic performance and democratization (e.g., Ehrlich and Liu,

1999; Kaufmann et al., 2009; Kaufmann and Wei, 1999). Such negative impact has been well documented by existing studies. Mauro (1995) was the first to publish empirical analyses on the relationship between corruption and economic growth. Cross-country empirical studies suggest that severe corruption significantly deters investment and economic growth. Brunetti et al. (1997), Brunetti and Weder (1998), Campos et al. (1999), and Wei (2000) also published empirical evidence documenting corruption's negative impact on the investments and Porison (1998) and Leite and Weidman (1999) published empirical evidence document corruption's negative impact on economic growth. Blackburn and Forgues-Puccio (2009) show that corruption is always bad for growth accords with the consensus view among development experts, however, exactly how bad the effect is can depend on the particular way in which corruption is practised. Bügel (2010) argues that corruption is predicted to reduce the volume of international trade, and hence has a negative effect on growth. Swaleheen (2011) investigates the effect of corruption on the rate of economic growth for a panel of countries during 1984–2007, finds that corruption has a significant and nonlinear negative direct effect on the growth rate of real per capita income. Park (2011) explore the impact of corruption on both the banking sector and economic growth for various countries over the period 2002–2004, finds some evidence of a new channel through which corruption lowers economic growth, i.e., corruption distorts the allocation of bank funds from normal projects to bad projects, which decreases the quality of private investments, hence it decreases economic growth.

However, Mo (2001)'s cross-country analyses initially shows that corruption has a significant negative effect on economic growth; but after factoring variables such as investment, human capital, and political instability into the analyses, has a diminishing impact and becomes statistically insignificant. Monte and Papagni (2001) study the case of Italy municipality shows that corruption not only directly limits the average labor income, but also decreases private investments, which in turn, decreases the efficiency of public investment expenditures and slows down economic growth. Gyimah-Brempon (2002)'s study on African countries show that corruption not only decreases economic growth but also contributes to unequal income distribution. Neeman et al. (2004)'s study shows that the extent that which corruption has a negative impact on a country's economic growth, is determined by the "openness" of the specific country. Svensson (2005)'s re-visit of Mauro (1995)'s study similarly supports the finding that corruption negatively impacts economic growth. Finally, Gyimah-Brempong and de Camacho (2006)'s study shows that while corruption has a negative impact on economic growth, there are significant countries-specific effects. For example, corruption's negative impact is most significant among African countries and least significant among Asian and OECD countries.

Table 1. CPI and Growth Rate

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Brazil									
CPI score	4.0	4.0	3.9	3.9	3.7	3.3	3.5	3.5	3.7
CPI ranking	46	45	54	59	62	70	72	80	75
Growth rate (%)	1	3	1	6	3	4	4	5	-1
Russia									
CPI score	2.3	2.7	2.7	2.8	2.4.	2.5	2.3	2.1	2.2
CPI ranking	79	71	86	90	126	121	143	147	146
Growth rate (%)	5	5	7	7	6	7	6	6	-8
India									
CPI score	2.7	2.7	2.8	2.8	2.9	3.3	3.5	3.4	3.4
CPI ranking	71	71	83	90	88	70	72	85	84
Growth rate (%)	5	4	7	8	9	9	8	7	5
China									
CPI score	3.5	3.5	3.4	3.4	3.2	3.3	3.5	3.6	3.6
CPI ranking	57	59	66	71	78	70	72	72	79
Growth rate (%)	8	9	10	10	10	11	10	9	9
World wide growth rate (%)	2.2	2.8	3.6	4.9	4.5	5.1	4.9	3.7	2.1
No. of countries included	91	102	133	145	158	163	179	180	180

Sources: CPI data was obtained from TI (http://www.transparency.org/). GDP growth rate was obtained from IMF (http://www.imf.org/external/index.htm).

Although most empirical studies agree that corruption negatively impacts economic growth, there are some scholars that believe corruption to have the opposite effect (e.g., Aidt, Dutta, and Sena, 2008; Ehrlich and Lui, 1999; Ergüngör, 2008; Huynh and Jacho-Chávez, 2009). The belief is that corruption heightens the administrative efficiency of government agencies and decreases the transactions cost of time, positively influencing economic growth. Leff (1964), Bayley (1966), and Huntington (1968) suggest that under certain circumstances, individuals or corporations may bribe policy makers to turn around unfavorable situations caused by existing law and regulations and other political inflexibilities and bolstering economic efficiency. In fact, Lui (1985)'s empirical study shows that political bribery has lead to shortened political processes. Similarly, Klitgaard (1988) and Acemoglu and Verdier (1998) both used the theoretical model to prove that when a nation is pursuing the maximization of national output, an optimal level of corruption exists. The studies suggest that while the optimal level may be relatively low, it still does exist because anti-corruption efforts represent a cost in itself. Wedeman (1997) discovered that many countries enjoy rapid economic growth despite facing corruption. Colombatto (2003)'s study suggests that in certain developing countries or totalitarian countries, corruption helps eliminate certain factors that hinder economic development. Furthermore, Glaeser and Saks (2006)'s study on the United States and Treisman (2007)'s cross-country study both show that corruption's impact on economic growth as not being statistically significant. Huynh and Jacho-Chávez (2009) use a variety of governance-related variables and find that these variables explain growth with varying success, producing negative, positive, or insignificant effects on growth. De Jong and Bogmans (2011) argue that corruption in general hampers international trade, whereas bribe paying to customs enhances imports. This effect is most robust in importing countries with inefficient customs. The effects of unpredictability of corruption and policies are inconclusive.

While previous empirical studies on the relationship between corruption and economic growth have led to inclusive results (various results and interpretations), this study attempts to contribute to this line of research by using the newly developed panel unit root tests, panel cointegration tests, and panel-based error correction model to investigate the relationship between economic growth and corruption among the BRICs.

DATA AND METHODOLOGY

Data

Our empirical analysis employed annual data on economic growth rate (growth), foreign direct investment (fdi), the degree of economic openness (open), corruption perception index (cpi) and share of government expenditures relative to GDP (ge), for Brazil, Russia, India and China over the sample period of 1995-2009. All data were obtained from the data bank of IMF, United Nations Conference on Trade and Development (UNCTAD), United Nations (UN), World Trade Organization (WTO) and TI respectively.

Methodology

Ever since Nelson and Plosser (1982) published their seminal work, various studies have been devoted to the investigation of potential non-stationary characteristics of important macroeconomic variables. Researchers have been especially interested in the time-series properties of real output levels. As pointed out by Nelson and Plosser (1982), the modeling of real output levels as either a stationary trend or a difference stationary process has important implications for macroeconomic policy making, modeling, testing and forecasting. Therefore, studies on this issue are of concern to not only empirical researchers but also to policymakers.

While numerous studies support the use of the unit root test of real output levels, critics claim that the drawing of such conclusions may be attributed to the fact that conventional unit root tests typically have lower power. More recently, it has been reported that conventional unit root tests not only fail to consider information across regions, therefore leading to less efficient estimations, but also have lower power when compared to stationary alternatives. It is not surprising that these factors have cast considerable doubt on many of the earlier findings that have been based on real output levels from unit root tests. A tangible approach for increasing the testing power of the unit roots is to consider the use of panel data.

Levin, Lin and Chu Panel Unit Root Test

Levin, Lin and Chu (2002) found that the panel approach substantially increases power in finite samples when compared with the single-equation ADF test. They proposed a panel-based version of equation (1) that restricts $\hat{\beta}_i$ by keeping it identical across cross-sectional regions, as shown below:

$$\Delta X_{i,t} = \alpha_i + \beta X_{i,t-1} + \sum_{j=1}^{k} \theta_{ij} \Delta X_{i,t-j} + \varepsilon_{i,t} \tag{1}$$

where Δ is the first difference operator, X_{it} is the variables deal with, ε_{it} is a white noise disturbance with a variance of σ^2, $t = 1, 2, .., T$ indexes time periods, and $i = 1, 2, \ldots 4$ indexes cross-sectional regions. LLC tested the null hypothesis for the existence of a unit root (i.e. the series is non stationary) with $\beta_1 = \beta_2 = \cdots = \beta = 0$ against the alternative of $\beta_1 = \beta_2 = \cdots = \beta < 0$, based on the test statistic:

$$t_\beta = \frac{\hat{\beta}}{se(\hat{\beta})} \tag{2}$$

Where $\hat{\beta}$ is the OLS estimate of β in equation (1), and $se(\hat{\beta})$ is its standard error.

Maddala and Wu Panel Unit Root Test

Using Fisher (1932)'s results and the *p*-values from individual unit root tests, Maddala and Wu (1999) develop a panel unit root test. Let π_i as the *p*-value of a unit root test from cross section units, the test statistic of Fisher is defined as:

$$-2 \sum_{i=1}^{N} \log(\pi_i) \rightarrow \chi_{2N}^2 \tag{3}$$

In addition, it demonstrates that:

$$Z = \frac{1}{\sqrt{N}} \sum_{i=1}^{N} \Phi^{-1}(\pi_i) \rightarrow N(0,1) \tag{4}$$

Maddala and Wu (1999) reports both χ_{2N}^2 and standard normal statistic values using ADF and Phillips-Perron (1988) individual unit root test, the null hypotheses of them are the same as the Im, Pesaran and Shin (2003) test.

Pedroni Heterogenous Panel Cointegration Tests

Pedroni (2004) developed a number of statistics based on the residuals of the Engle and Granger (1987) study. Pedroni supported heterogeneity among individual members of the panel, and included heterogeneity in both the long and short-run cointegrating vectors. By so doing, Pedroni developed seven panel cointegration statistics for varying intercepts and varying slopes. Four of them qualify as pooled panel cointegration statistics that have within-dimension characteristics. The other three, group mean panel cointegration statistics, have between-dimension characteristics. The pooled panel cointegration test statistics are as follows: panel v-statistics, panel rho-statistics, panel PP-statistics and panel ADF-statistics. The group-mean panel cointegration test statistics are as follows: group rho-statistics, group PP-statistic sand group ADF-statistics

Pedroni (2004) argued that for cases with longer time spans (such as, T > 100), the sample size distortion tends to minimal, while retaining a very high testing power across all seven statistics. However, for shorter panels, alternative statistics appeared to yield conflicting evidence. Pedroni (2004) showed that in terms of testing power, the group-ADF statistic has the best performance in general, followed by the panel-ADF. The panel-variance and group-rho statistics performed poorly in comparison.

Panel Vector Error Correction Model

When real government revenues and expenditures are co-integrated, a long run relationship exists between them. We can use the vector error correction model to characterize both long run equilibrium relationships and short run dynamic adjustment processes between government revenues and expenditures. The vector error correction model for Brazil, Russia, India and China with heterogeneous panels is shown as follows:

$$D(growth)_{i,t} = \alpha_1 + \sum_k \theta_{11i,k} D(growth)_{i,t-k} + \sum_k \theta_{12i,k} D(cpi)_{i,t-k}$$
$$+ \sum_k \theta_{13i,k} D(fdi)_{i,t-k} + \sum_k \theta_{14i,k} D(ge)_{i,t-k} \qquad (5)$$
$$+ \sum_k \theta_{15i,k} D(open)_{i,t-k} + \lambda_{1,i} \varepsilon_{i,t-1} + \eta_{i,t}$$

Where k is the lag length, $\varepsilon_{i,t-1}$, and $\eta_{i,t}$ are error correction terms and statistical noises respectively. λ_i is the speed of adjustment to long-run equilibrium.

EMPICAL RESULTS

Table 2 reports the results of the non-stationary tests for growth, fdi, open, ge and cpi variables using LLC, ADF-Fisher and PP-Fisher tests. Each data series is non-stationary in terms of levels but stationary with respect to first differences, suggesting that all of the data series are integrated of order one. Having established that growth, fdi, open, ge and cpi variables are I(1) in their level form, the long run relationship is estimated using panel cointegration tests. The panel cointegration models are used in order to draw sharp inferences since the time span of an economic time series are typically short. The estimated Pedroni's test statistics are given in Table 3. The results presented in Table 3 show that the null hypothesis of no cointegration among the series of growth, fdi, open, ge and cpi is rejected by the five test statistics at the 1% significance level, except for the panel v-statistic and group rho-statistic. These results suggested that the corruption perception index (cpi), foreign direct investment (fdi), the degree of economic openness (open), and share of government expenditures relative to GDP (ge) are helpful in explaining GDP growth for BRIC countries in the long run, vice verse.

The empirical results of the panel error correction model are reported in Table 4. With the focus on equation (5), the estimated coefficients of D(growth)$_{t-1}$, D(cpi)$_{t-2}$, D(fdi)$_{t-2}$, D(ge)$_{t-1}$, D(ge)$_{t-2}$ and D(open)$_{t-1}$ are not significant. Thus there is not enough evidence to support that short run causality exists between

government expenditures and economic growth. The significance of the speed of adjustment, λ (i.e. the coefficient of ε), explains the long run relationship observed during the co-integrated process. We reject the null hypothesis $H_0 : \lambda_{1i} = 0$ for all i in equation (5). Therefore, long run equilibrium exists between GDP growth and fdi, open, ge and cpi variables for four BRIC countries.

Table 2. Panel Unit Root Tests

	LLC test		ADF-Fisher test		PP-Fisher test	
	Level	Difference	Level	Difference	Level	Difference
Growth	0.88424	-4.53939***	7.39801	17.1833*	6.94140	29.6234***
Fdi	2.68913	-3.48081***	1.19687	21.8528**	1.13359	15.7660*
Open	0.07549	-3.65079***	7.06164	22.8752**	6.19216	35.6952***
Ge	-0.23782	-3.90440***	3.23556	21.4293**	3.43317	19.8255**
Cpi	-1.21250	-5.75348***	7.83093	38.3977***	10.4660	37.4921***

Note: ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

Table 3. Panel Cointegration Tests (with growth as dependent variable)

Tests	Test Statistics
Panel v-Statistics	-0.282562（0.3833）
Panel rho-statistics	-2.311722（0.0276）**
Panel PP-statistics	-6.250658（0.0000）***
Panel ADF-statistics	-2.262054（0.0309）**
Group rho-statistics	3.353365（0.0014）***
Group PP-statistics	-6.250658（0.0000）***
Group ADF-statistics	-2.499281（0.0176）**

Notes: The *p*-values are given in parentheses. *** and ** indicate significance at the 1% and 5% levels.

Table4. Panel Error Correction Model

Independent Variables	Dependent Variables				
	D(growth)t	D(cpi)t	D(fdi)t	D(ge)t	D(open)t
D(growth) $_{t-1}$	-0.093699	0.019376	-0.000723	-0.001538	-0.003614
	(-0.42489)	-1.17103	(-1.48500)	(-0.93333)	(-1.21920)
D(growth) $_{t-2}$	-0.424778**	-0.015111	-0.00008	0.002154	-0.002557
	(-2.01565)	(-0.95566)	(-0.17096)	-1.36811	(-0.90292)
D(cor) $_{t-1}$	-3.955056*	0.1648	-0.000262	-0.000508	0.004919
	(-1.80092)	(-1.00012)	(-0.05404)	(-0.03098)	(-0.16666)
D(cpi) $_{t-2}$	-1.030324	-0.27631	-0.002132	-0.004704	-0.022292
	(-0.43766)	(-1.56429)	(-0.41004)	(-0.26746)	(-0.70458)
D(fdi) $_{t-1}$	-212.5848**	-7.66683	0.252066	0.513239	-0.589898
	(-2.19880)	(-1.05688)	(-1.18023)	(-0.71059)	(-0.45398)
D(fdi) $_{t-2}$	-17.06954	-1.164985	0.030324	0.382183	-0.10466
	(-0.18596)	(-0.16915)	(-0.14955)	(-0.55733)	(-0.08484)
D(ge) $_{t-1}$	-27.36579	-0.222624	-0.11075*	0.325725	-0.598492
	(-0.95773)	(-0.10384)	(-1.75464)	(-1.52591)	(-1.55847)
D(ge) $_{t-2}$	-10.02798	-2.938993	-0.021151	0.016177	-0.033142
	(-0.34320)	(-1.34058)	(-0.32769)	(-0.07411)	(-0.08440)
D(open) $_{t-1}$	27.53418	-1.388407	0.017649	0.053328	0.416197*
	-1.54896	(-1.04098)	(-0.44946)	(-0.40157)	(-1.74209)
D(open) $_{t-2}$	35.05353**	2.231913**	0.010647	-0.025917	0.009262
	-2.34277	-1.98807	(-0.32211)	(-0.23186)	(-0.04606)
ε_{t-1}	-0.730742***	-0.029136*	-0.000679	-0.002301	-0.004703
	(-3.08871)	(-1.64135)	(-1.29944)	(-1.30185)	(-1.47902)

Notes: The t-statistics are given in parentheses. ***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively. The Schwartz Information Criterion (SIC) suggests 2 lags for our PECM.

CONCLUSION

The commonality between the four BRIC countries is that they represent large countries with huge populations that have immense needs and therefore, buying power. Among the BRIC countries, China, India, and Russia benefit additionally from their immense man power, while Russia and Brazil enjoy bountiful natural resources. In the recent years, these countries have experienced significant economic growth not only because of the aforementioned reasons, but also because they have exported large amounts of products, services, and resources, and thus have rapidly accumulated foreign reserves. However, the BRIC countries are not without other economic issues, including large income gaps between the rich and the poor and money debt resulting from political corruption. However, even though the BRIC countries have lower corruption perception index values and therefore face significant corruption, these countries still manage to enjoy high economic growth rates that result from significant foreign investments.

In this study we use panel unit root, panel unit cointegration, and panel error correction model techniques to examine the corruption-economic growth nexus in a panel of four BRICs country (Brazil, Russia, India, and China) over the 1995 to 2009 period. The empirical results of this study suggest that among the various variables behind economic growth, direct foreign investments and economic openness represent the most influential factors, with economic openness having a significant negative correlation with corruption for the lag two periods, and an insignificant effect on corruption for the lag one period. These results correspond with that of existing studies, such as Shen, Lee and Lee (2010), Tornell et al. (2004), and Basu et al. (2003). The results of this study also suggest that for the lag one period, the corruption perception index has a positive correlation with current period economic growth. However, this correlation is only statistically significant for the lag one period. In addition, results suggest that government expenditure and economic growth do not have a statistically significant direct correlation. More specifically, estimations from the panel error correction models suggest that in the short run there is a significant positive relationship between corruption and economic growth, while in the long run, corruption is no longer the most important factor that affects economic growth. Instead, foreign direct investment and the degree of economic openness are the key factors that influence a country's economic growth. We are unable to validate the claim that higher corruption is beneficial to economic growth because economic growth depends on country-specific factors such as direct foreign investment and market openness.

As the empirical results indicate, direct foreign investments and economic openness represent the most influential factors on country's economic growth; with economic openness having a significant, negative correlation with corruption. We identify two important policy implications that will enhance the effects of foreign direct investment and the degree of economic openness on economic growth based on the results of this study. First of all, Brazil, Russia, India, and China should strive to develop mature financial markets that include the trading activities of capital markets, and also make an effort to prevent a banking crises or currency crisis that may negatively impact economic growth. Secondly, the four BRICs country's trade policies should be more deregulated in order to reinforce the potential growth impact of foreign direct investments. Although the empirical results of this study does not show that corruption level has a significant influence on the investments, expenditure, and economic openness, we believe that in the long run, when the economy grows to a certain level and government corruption still has not receded, these emerging market economies may likely cease to flourish.

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