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Understanding The Sources of National Competitiveness And Innovation of Gulf-Based Emerging Markets: The Case of The United Arab Emirates

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ABSTRACT

The United Arab Emirates (UAE) is a fascinating country located on the Arabian shore of the Persian Gulf that has experienced a vertiginous economic growth over the past years. Considering that the country has attained noteworthy regional and international standings in only a few decades, the purpose of this article is to uncover and discuss the specific sources of national competitiveness and innovation of the UAE. This analysis is both relevant and timely for understanding how this constantly evolving economy has achieved its current level of development and for delineating future strategic priorities for allowing a successful implementation of its long-term vision. The UAE has become an important player on the world map and is determined to take advantage of its central geographical location to transform itself into a hub for global aerospace, logistics, finance and trade. To illustrate the pillars on which the country relies to secure its competitive advantage and engage in innovative undertakings, we focus on analyzing and benchmarking the UAE's rankings from the latest Global Competitiveness Index (GCI) and Global Innovation Index (GII). Our article seeks to not only introduce the reader to the recent national accomplishments but also open opportunities for a constructive debate on how the UAE can continue its journey of sustainable growth and development.

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INTRODUCTION

Being part of the broader Middle East and North Africa (MENA) region and located on the Arabian shore of the Persian Gulf, the United Arab Emirates (UAE) is a mesmerizing country that has witnessed a fast-paced growth over the last decades. Since the discovery of oil in the 1960s, the UAE has rapidly evolved from a trading society heavily reliant on the pearl diving and fishing industries into a booming economy with modern facilities and state-of-the-art technology (Furr and Furr, 2013). The seven emirates constituting the UAE federation, and particularly Dubai and Abu Dhabi, have made significant financial investments for developing their infrastructure and providing their citizens and foreign residents with high standards of living. These efforts have led to the emergence of internationally recognized brands in airline (Emirates Airlines), real estate (Emaar), hospitality (Jumeirah) and marine terminal operations (DP World) industries which are posing serious competitive threats to well-established global brands that were traditionally located in Western markets (Bell, 2009). The country is home to many world-class attractions such as Burj Al Arab (the only seven-star hotel in the world), Dubai Mall (the biggest shopping center ever built), Palm Jumeirah (palm tree shaped artificial island hosting the famous Atlantis hotel), Burj Khalifa (the tallest man-made structure to date) and Yas Island Ferrari World located in Abu Dhabi, to name just a few.

Since 1971 when the UAE proclaimed independence, the sheiks of the emirates have been setting ambitious long-term development objectives and displaying relentless commitment to funneling excess oil revenues toward the achievement of a broader industrial diversification for securing sustainable national growth (Swan, 2013a). According to the 2013-2014 Global Competitiveness Report (GCR), with a total population of 7.9 million inhabitants, the UAE is ranked 83rd out of 148 economies included in the report (World Economic Forum, 2013). Although UAE is a relatively small country population-wise where only about 12% are Emirati citizens while the majority of residents constitute self-initiated expatriates (Forstenlechner et al., 2012), it is currently considered as one of the wealthiest nations in the world (Tlaiss, 2013). With a Gross Domestic Product (GDP) of US$ 358.9 billion, UAE occupies the 33rd position in the GCR ranking, while with a GDP per capita of US$ 64,840 it is ranked 6th worldwide being preceded only by Australia (5th), Switzerland (4th), Norway (3rd), Qatar (2nd) and Luxemburg (1st). In terms of the 'sectoral value-added as a share of GDP', the non-manufacturing industry makes the largest contribution (48%) to the country's GDP, followed by services (38%), manufacturing sector (12%) and agriculture (2%).

UAE is one of the six founding members (along with Bahrain, Kuwait, Oman, Qatar and Saudi Arabia) of the Gulf Cooperation Council (GCC) which represents a political and economic union of

Gulf-based Arab states (Bodolica, 2013). The country is ranked 5th in terms of the 'government budget balance as a percentage of GDP', taking the lead over other GCC countries such as Saudi Arabia, Oman and Qatar which come in the 6th, 8th and 10th place, respectively (World Economic Forum, 2013). With regard to both the 'national savings as a percentage of GDP' and the 'general government debt as a percentage of GDP', UAE occupies the 18th position being preceded only by Qatar (3rd on the former indicator), Saudi Arabia (5th and 4th, respectively), Oman (8th and 5th, respectively) and Kuwait (6th on the latter indicator). As far as the 'imports of goods and services as a percentage of GDP' are concerned, UAE is ranked 29th followed by Oman (76th) and Qatar (119th), whereas on the 'exports of goods and services as a percentage of GDP' indicator the country secured a higher standing (16th) with Qatar, Oman and Kuwait occupying the 22nd, 24th and 25th position, respectively. As indicated in the latest GCR, the UAE's 17th place worldwide on the 'prevalence of foreign ownership' of companies represents the highest ranking in the GCC region, followed by Bahrain, Oman and Qatar which are ranked 20th, 63rd and 68th, respectively.

Taking into consideration that these noteworthy regional and international standings were attained in only a few decades, the purpose of this article is to uncover and discuss in more detail the specific sources of national competitiveness and innovation of the UAE. It is our belief that this analysis is both relevant and timely for understanding how this constantly evolving economy has achieved its current level of development and for delineating future strategic priorities for allowing a successful implementation of its long-term vision. Despite the detrimental effects of the recent financial crisis which hit the emirate of Dubai hardest because of its greater exposure to deflated real estate prices, the country has been working on finding plausible ways to recover and maintain its pace of economic growth (Madichie, 2011). The UAE has become an important player on the world map and is determined to take advantage of its central geographical location to transform itself into a hub for global aerospace, logistics, finance and trade (Swift, 2013; Ali and Al-Aswad, 2012).

This aspiration to strengthen its international presence is manifested in the country's continuous involvement in mega-events and mega-projects such as the hosting of World Expo in 2020 (Global Investment House, 2013) and the construction of Al Maktoum International Airport (expected to become the world's largest airport) (Cha, 2013) and Saadiyat Island (a cultural center in Abu Dhabi featuring the second Louvre museum in the world) (National Staff, 2013). To illustrate the pillars on which the UAE relies to secure its competitive advantage and engage in innovative undertakings, in this article we focus on analyzing and benchmarking the country's rankings from the latest Global Competitiveness Index (GCI) and Global Innovation Index (GII). Our analysis seeks to not only introduce the reader to the recent national accomplishments but also open opportunities for a constructive debate on how the UAE can continue its journey of sustainable growth and development.

This remainder of this article is structured along the following lines. The next section is dedicated to the discussion of initiatives undertaken by the UAE government to gradually transform the country from a resource-intensive nation into a knowledge-based economy. Relying on the most recent GCI and GII, an illustration of UAE's international rankings in terms of competitiveness and innovation follows. We continue by highlighting several challenges that should be addressed in the future if the UAE is to continually enhance its competitive stance and capacity for innovation. In the concluding section we summarize the article and encourage further research attention on this constantly evolving country of the world.

TOWARDS A KNOWLEDGE-BASED ECONOMY

The 2013-2014 GCR clusters the 148 ranked countries in five different categories based on their respective stage of development, namely stage 1 ('factor-driven'), transition from stage 1 to 2, stage 2 ('efficiency-driven'), transition from stage 2 to 3, and stage 3 ('innovation-driven'). As indicated in this report, UAE, Bahrain and Qatar are located at the stage 3 of development, while the remaining GCC states are transitioning from stage 1 to 2 (Kuwait and Saudi Arabia) and from stage 2 to 3 (Oman). Although UAE is a resource-rich country, it falls under the 'innovation-driven' category along with other 36 included states, being part of the most technologically-advanced economies in the world (World Economic Forum, 2013). With 97.8 billion barrels (Nagraj, 2013) and 6,089 billion cubic meters (CIA World Factbook, 2013) the UAE possesses the world's seventh biggest proven reserves of both crude oil and natural gas. From a capital intensive paradigm, the extensive availability of oil, gas, minerals and precious metals has been typically associated with higher levels of national wealth creation, investing resource-abundant countries with a natural competitive advantage. Nowadays, however, the possession of significant of natural reserves does not constitute per se a driver of economic growth and development.

What UAE has been doing over the past years was to utilize the dramatic surplus of wealth stemming from the exploitation of its oil and gas resources for productively investing in the long run and enhancing the country's potential for engaging in innovative undertakings. A nation-wide strategy – UAE Vision 2021 – was formulated with the intention to reduce the country's dependency on oil and transform it into a knowledge-based, innovation-driven and service-oriented society (World Economic Forum and European Bank for Reconstruction and Development, 2013). Local policy makers recognize the key benefits of the knowledge-based economy which heavily relies on the

strategic management of intangible assets (e.g., know-how, experience, innovative culture, learning curve) that are valuable, unique and difficult to imitate (Spraggon and Bodolica, 2008; 2012). To materialize the UAE Vision 2021, government officials have been designing and implementing a variety of strategic initiatives aiming at diversifying the UAE's sources of competitive advantage and steadily moving away from being a resource-intensive nation. The country's superior rents accruing from its oil-related business operations have been invested in upgrading the infrastructure, developing urban areas, acquiring state-of-the-art technology, deploying new information and communication technologies, fostering scientific research and encouraging innovation in various sectors of economy.

Regarding its educational sector, the UAE government has been focusing on rejuvenating and aligning university curricula with the actual needs of the job market to ensure that graduating students are well equipped to deal with the inherent challenges of a knowledge-based economy. Attracted by the high level of UAE's annual economic growth, many prestigious foreign universities (e.g., University of Wollongong, London Business School, Paris-Sorbonne University, New York Institute of Technology) have opened international branch campuses in the country making the local market of higher education highly competitive (Wilkins, 2010). Due to the prevalence of cross-border models of education delivery, Knowledge and Human Development Authority was established in Dubai to oversee the quality of private education and secure that the relevant international standards of teaching and learning are maintained (Rawazik and Carroll, 2009). These quality enhancement initiatives in higher education were coupled with the implementation of new programs aiming at ensuring continuous faculty development and offering competitive funding to support scholarly research (World Economic Forum and European Bank for Reconstruction and Development, 2013).

The tax-free environment and competitive compensation packages permitted to attract talented scientists and professionals from all over the world to satisfy the growing demand for skilled labor in the UAE's private sector. The recruitment of foreign talent have been at the realm of human resource strategies to accomplish the UAE's Vision 2021, contributing to a predominantly cosmopolitan makeup of the resident population of the country. With the shrinking availability of highly-remunerated public sector jobs that are typically filled by UAE citizens, the government has turned its efforts towards engaging Emirati people in the economic and social development of the nation by adopting Emiratization programs to increase their level of participation in the private sector labour market (Al-Waqfi and Forstenlechner, 2014). Progressive policies have been designed to achieve gender equality, educate female nationals permitting the UAE to reach "the world's highest rate of women in higher education", empower them and provide institutional assistance for stimulating female entrepreneurship (Goby and Erogul, 2011). Local decision makers started to emphasize the need for educational institutions to cultivate entrepreneurial attitudes among native male and female students and enhance their propensity to launch their own business ventures (Majumdar and Varadarajan, 2013).

Another important initiative for boosting national innovation levels and facilitating the generation of new knowledge has been the establishment of collaborative undertakings between the private sector and academia. The public-private cooperation was enabled by the creation of knowledge-intensive clusters and free trade zones such as Dubai Knowledge Village, Internet City, Dubai International Financial Center (DIFC), twofor54, Dubai Media City and Masdar City (World Economic Forum and European Bank for Reconstruction and Development, 2013). For instance, with over 800 member institutions DIFC became the biggest financial hub in the region ahead of Bahrain Financial Harbor and Qatar Financial Center which incorporate about 410 and 120 institutions, respectively (Ali and Al-Aswad, 2012). Being one of the world's largest sovereign wealth funds, the activities of Abu Dhabi Investment Authority are influential in international finance.

A relevant example of governmental efforts to stimulate the search of renewable sources of energy and offer zero-carbon low-waste comfort to its residents represents the Masdar City. This green urban development and clean technology cluster in Abu Dhabi aims to position the emirate as a global leader in cutting-edge discovery of sustainable energy solutions that produce the lowest environmental footprint (Madichie, 2011). Hence, these knowledge-rich clusters provide opportunities for networking with talented individuals and organizations and for developing supportive communities of practice whereby knowledge is fertilized across disciplines and entrepreneurial activities are carried out, resulting in the generation of breakthrough innovations.

Government authorities have also been paying an increased attention to the establishment of reliable institutional and legal frameworks with the purpose of enhancing the level of transparency, accountability and compliance in UAE companies through the implementation of a variety of corporate governance policies. With the support of DIFC and other prominent international and regional financial institutions, the Hawkamah Institute for Corporate Governance was established in 2006 in order to bridge the gap in governance structures and systems of MENA-based corporations. Many listed firms in UAE started to voluntarily disclose their financial information, where the size and composition of corporate boards and directors' competence are influential in driving the non-mandatory adoption of best disclosure practices in publicly-traded local organizations (Adawi and Rwegasira, 2011). In a comparative study of corporate governance effectiveness in GCC states measured in terms of internal organizational processes,

shareholder rights and obligations, and information transparency, UAE received an average total score being preceded by Oman and Kuwait and followed by Bahrain and Qatar (Baydoun et al., 2013).

BENCHMARKING UAE: INTERNATIONAL RANKINGS

A relevant question to address is whether these multiple government-driven initiatives across sectors have improved the UAE's competitive advantage and translated in higher capabilities for innovation relative to other economies. In the following sections we rely on the most recent GCI and GII to benchmark the UAE and report its international rankings in terms of national competitiveness and innovation.

■ Global Competitiveness Index

According to the 2013-2014 GCI, UAE is ranked 19th out of 148 benchmarked economies with a score of 5.11 out of 7 (World Economic Forum, 2013). The country has gained five positions from the previous year and moved up in the GCI ranking to occupy the 2nd place in the GCC region after Qatar. Since the 2011-2012 GCI, UAE has gained eight positions demonstrating its capacity to continuously enhance its competitiveness. In the three GCI sub-indexes of 'basic requirements', 'efficiency enhancers' and 'innovation and sophistication factors', the country is ranked 4th, 20th and 24th with a score of 6.04, 5.00 and 4.67, respectively. Table 1 reports the UAE's rankings and scores related to the various sub-indexes and pillars of the GCI. Out of the 12 pillars composing the three sub-indexes mentioned above, 'institutions', 'infrastructure', 'macroeconomic environment', 'goods market efficiency', 'labor market efficiency', 'financial market development' and 'business sophistication' represent the seven pillars on which the country outperforms the other 36 economies located at the 'innovation-driven' stage of development.

Table 1: UAE's rankings and scores on the sub-indexes and pillars of the GCI

(A)	**Sub-Index**	***Pillars***					
Items	*Basic requirements*	Institutions	Infrastructure	Macroeconomic environment	Health & primary education		
Rank	4	11	5	7	49		
Score	6.04	5.55	6.20	6.42	5.97		
(B)	**Sub-Index**	***Pillars***					
	Efficiency enhancers	Higher education and training	Goods market efficiency	Labor market efficiency	Financial market development	Technological readiness	Market size
Rank	20	35	4	9	24	28	44
Score	5.00	4.93	5.39	5.20	4.79	5.22	4.44
(C)	**Sub-Index**	***Pillars***					
	Innovation & sophistication factors	Business sophistication	Innovation				
Rank	24	16	28				
Score	4.67	5.13	4.22				

With regard to the 'institutions' pillar, UAE has the lowest level of 'organized crime', the 2nd lowest level of 'business costs of crime and violence', the 3rd lowest level of 'wastefulness of government spending', the 3rd highest level of 'public trust in politicians', and the 5th lowest level of occurrence of 'irregular payments and bribes' in the world. The country is ranked 12th on the 'transparency of government policymaking', 14th on the extent to which organizations adopt 'ethical behaviors' in their interactions with public officers, politicians and other firms, and 20th on the degree of 'protection of intellectual property'. Concerning the 'protection of minority shareholders' interests', the 'efficacy of corporate boards', and the 'strength of auditing and reporting standards', UAE occupies the 13th, 24th and 28th position, respectively.

In terms of the 'infrastructure' pillar, the country is positioned 1st for the 'quality of roads', 3rd for the 'quality of air transport infrastructure', and 4th for both the 'quality of port infrastructure' and the 'quality of overall infrastructure'. Regarding the pillar related to the 'macroeconomic environment', UAE is ranked 28th on the indicator titled 'country credit rating' compared to other economies. As far as the 'health and primary education' pillar is concerned, UAE has the world's lowest level of both 'business impact of malaria' and 'HIV prevalence, percentage of adult population', and occupies the 19th place on the 'quality of primary education'. The 'extent of staff training' (13th), the 'quality of the educational system' (15th) and the 'quality of management schools' (28th) constitute the three indicators pertaining to the pillar of 'higher education and training' on which UAE obtained the highest rankings. In terms of the 'local availability of specialized research and training services' and the extent to which 'companies invest in training and employee development', UAE is positioned 19th and 13th in the world, respectively.

Concerning the pillar of 'goods market efficiency', the country is ranked 3rd on the 'effect of taxation on incentives to invest', 5th on both the low 'prevalence of trade barriers' and the low 'burden of customs procedures', 6th on the 'total tax rate as a percentage of profits', and 7th on the 'effectiveness of anti-monopoly policy'. UAE appears to be very sensitive to its customers' needs and preferences as it is positioned 7th worldwide on the 'degree of customer orientation'. With regard to

the 'labor market efficiency' pillar, UAE is placed 3rd on both the 'flexibility of wage determination' and the 'effect of taxation on incentives to work', and 6th (7th) on the 'country capacity to retain (attract) talent'. In the pillar titled 'financial market development', it occupies the 3rd place in the list on the 'ease of access to loans' and 10th on the 'venture capital availability' in the country.

Regarding the 'technological readiness' pillar, UAE is positioned 2nd on the extent to which foreign direct investments facilitate the access to new technology and enable technology transfer, 4th on the capacity of local businesses to absorb new technology and 8th on the extent to which the latest technologies are available in the country. In terms of the 'market size' pillar, UAE is ranked 29th on the 'foreign market size index' which seeks to measure the value of products and services the country exports. In the 'business sophistication' pillar, UAE obtained a very high ranking (3rd) on both 'control of international distribution' and 'state of cluster development', and is placed 13th (20th) relative to other economies on the 'local supplier quantity (quality)' indicators. Additionally, UAE is ranked 26th on the nature of competitive advantage of the country's companies, implying their tendency to compete internationally by offering differentiated products and services rather than by lowering prices or merely relying on natural resources. Finally, with regard to the 'innovation' pillar, UAE has secured the 3rd position on the indicator titled 'government procurement of advanced technology products' and is placed 13th on the 'availability of scientists and engineers' in the country.

■ Global Innovation Index

According to the 2013 GII (Cornell University, INSEAD and WIPO, 2013), UAE is located in the 38th place out of 142 ranked economies with a total score of 41.87 out of 100. Although the country moved one position down from the 2012 GII ranking, it remains the leader in the GCC region followed by Saudi Arabia (42nd), Qatar (43rd), Kuwait (50th), Bahrain (67th) and Oman (80th). Because the GII is calculated by determining the average between the innovation input and output sub-indexes, it is worth understanding the country's ranking on those two sub-indexes. The innovation input sub-index is composed of five pillars, namely 'institutions', 'human capital and research', 'infrastructure', 'market sophistication' and 'business sophistication', while the innovation output sub-index is composed of two pillars, including 'knowledge and technology outputs' and 'creative outputs'. Table 2 reports the UAE's rankings and scores on the sub-indexes and pillars of the GII.

Table 2: UAE's rankings and scores on the sub-indexes and pillars of the GII

Items	**Sub-Index**	***Pillars***				
(A)	*Innovation input*	Institutions	Human capital & research	Infrastructure	Market sophistication	Business sophistication
Rank	26	33	24	22	63	22
Score	54.0	75.6	50.0	49.7	47.3	47.3
(B)	*Innovation output*	Knowledge & technology outputs	Creative outputs			
Rank	81	131	28			
Score	29.8	12.0	47.6			
(C)	*Innovation Efficiency Ratio*					
Rank	133					
Score	0.6					

Concerning the innovation input sub-index, the country is placed 26th with a score of 54.0 out of 100, whereas with regard to the innovation output sub-index, UAE occupies the 81st position with a score of 29.8 out of 100. The GII makes use of the Innovation Efficiency Ratio, calculated as the ratio of the output over the input sub-indexes, because it allows achieving neutrality in results when comparing economies that are at different stages of development. Indeed, it is very important to analyze the relationship between income groups and efficiency ratios given that some countries may achieve higher innovation efficiency ratios as a consequence of lower input scores. UAE and other two GCC states (Bahrain and Oman) have the lowest efficiency ratios among high-income economies (Cornell University, INSEAD and WIPO, 2013). Overall, UAE and other MENA countries such as Oman, Kuwait, Bahrain, Yemen, Egypt and Lebanon display below par innovative performances when compared to their income levels. The Innovation Efficiency Ratio of the UAE is ranked in the 133rd place in the list of 142 included nations with a score of 0.6.

CHALLENGES FOR THE FUTURE

The UAE's continuous efforts to diversify its economy resulted in an unparalleled growth compared to other resource-rich countries permitting to secure higher levels of national competitiveness which is manifested through modern infrastructure, highly efficient goods market, solid macroeconomic stability and positive citizens' perception of politicians. This growth phenomenon can also be explained by the fact that the country is independent from political cycles and significant ideology changes, which are typical to democratic nations. In spite of these achievements, many challenges persist and should be addressed if the UAE wishes to continue its pace of economic development. Among the most

problematic factors for doing business in the UAE, the 2013-2014 GCR refers to restrictive labor regulations, limited access to financing, inadequately educated workforce and high levels of inflation (World Economic Forum, 2013). Although the government invests heavily in advanced, state-of-the-art technology, the country still lags in its capacity to innovate (ranked 39th) exhibiting a low percentage of patents filed under the Patent Cooperation Treaty per million people (46th) and a relatively weak quality of research institutions (34th).

While the UAE is positioned in the 24th place on the level of research and development (R&D) spending, more investments in basic scientific research could accelerate the nation's innovation rate through an enhanced capacity to engage in innovative undertakings. For instance, Qatar allocates significant amounts for funding R&D expenditures being ranked 9th worldwide and 1st in the MENA region. The UAE can also work on improving its global ranking (24th) on the extent to which local businesses and universities collaborate on R&D projects because these endeavors enable the creation of new knowledge and set the platform for innovation generation. Qatar has secured a high standing in this regard (7th) demonstrating its leadership in the MENA region regarding research collaborations between academia and private sector (World Economic Forum, 2013).

Another challenge faced by the UAE is related to the low level of enrollment of nationals in primary (ranked 106th), secondary (60th) and tertiary (86th) education. If the country wants to develop in-house knowledge and innovation capabilities to reduce its heavy reliance on expatriate know-how, increasing primary and secondary education enrollment among the native population constitutes a minimum contingency. Regarding higher education, the government started to offer financial incentives to encourage Emiratis to attend prestigious foreign universities in order to acquire up-to-date knowledge and skills. Going forward, the UAE officials may be required to allocate more resources for enhancing the quality of national education by designing programs that do not focus solely on US-style education (Swan, 2013b) and developing curricula that are aligned with the evolving needs of the local market. In addition, there seems to be a significant disparity with regard to the ratio of Emirati women and men in the labor force as the country occupies the 131st position in the global ranking. According to Goby and Erogul (2011), local women encounter some socio-cultural constraints which prevent them from initiating a professional career particularly in the private sector. The UAE policy makers may need to put in place a set of initiatives to facilitate the inclusion of female citizens in the labor market and provide institutional assistance for supporting their entrepreneurial activities.

As the market of public sector jobs has reached its saturation point, the country's overriding concern became the increasing unemployment rate among the young population of indigenous Emiratis notwithstanding the implementation of the Emiratization program in the late 1990s (Al-Waqfi and Forstenlechner, 2014). The current challenge for the government is to direct the younger generation of citizens towards filling more volatile private sector jobs and to design suitable mechanisms for incentivizing employers to recruit educated locals at a premium when a wide pool of cheaper and skilled non-national labor is available. According to Forstenlechner and Rutledge (2011), there is an urgent need for policy intervention to address the UAE's 'demographic imbalance' which, despite being an economic necessity, generates non-negligible costs in terms of reduced productivity, remittance outflows and labor market inefficiencies. The authors propose a large-scale reform of the labour market where highly educated non-nationals would be provided with incentives to invest in their country of residence, the professionalization of unskilled foreign workers (particularly in the construction industry) would be pursued in tandem with continuous upgrades in labour-saving technologies and significant investments in developing national human capital would be made from the bottom up starting from improvements in primary and secondary education sector.

In terms of the 'strength of investor protection', the 2013-2014 GCR places the UAE in the 107th position, sharing the same ranking with Cameroon, Ethiopia, Luxembourg, Hungary, Jordan, Philippines, Swaziland and Zimbabwe. According to Adawi and Rwegasira (2011), of particular importance in the context of emerging markets is the need to build higher levels of investor confidence by inducing local companies to implement international standards of best practice in terms of information transparency and disclosure. Making corporations more accountable to shareholders may increase their attractiveness in the eyes of potential investors originating from both within and outside the UAE. In a recent study of 95 UAE publicly-traded firms, Hassan and Halbouni (2013) found that voluntary disclosure, board size and dual leadership structures are significant drivers of the accounting-based measures of performance (i.e., return on assets and return on equity) of these firms. Building an appropriate framework for the adoption of various governance mechanisms such as the optimal make-up of governing boards of directors and the incentive design of executive compensation packages (Bodolica and Spraggon, 2009a,b; Spraggon and Bodolica, 2011) could be favorable in the long run for securing the sustainability of local organizations.

The suggested improvements in regulatory infrastructures and information reporting may be beneficial to both companies listed on the local stock exchanges (i.e., Abu Dhabi Securities Exchange and Dubai Financial Market) and privately-held businesses such as family-owned enterprises which represent the dominant form of organization in the country (Bodolica and Spraggon, 2012; Shahid et

al., in press; Spraggon et al., 2012). To drive local reforms in the field of corporate governance, policy makers can inspire themselves from the models of 'rules-based' or 'comply-or-explain' governance regimes prevailing in the United States or Canada (Spraggon et al., 2013). In doing so, regulators should consider the unique characteristics of the UAE environment, such as high degree of liquidity, lack of pension funds, predominance of concentrated ownership structures, non-prevalence of foreign institutional investors, weak governance-related disclosure and preponderance of insiders or related directors on the board (Adawi and Rwegasira, 2011), for designing a possibly distinctive MENA/GCC model of corporate governance (Piesse et al., 2012).

Furthermore, while the level of efficiency of 'customs procedures' is very high (5^{th}) and non-tariff barriers are very low (5^{th}) implying an ability of imported goods to freely compete in the UAE market, it has been noted in the 2013-2014 GCR that 'inefficient government bureaucracy' constitutes another challenging factor for doing business in the country. UAE is ranked 47^{th} regarding the 'number of procedures required to start a business' and 34^{th} in terms of the 'time required to start a business' (World Economic Forum, 2013). According to Furr and Furr (2013), the growth of the private sector in the UAE is restricted by an intolerant bankruptcy law which ought to be revised if the country wishes to stimulate entrepreneurship and encourage businesspeople to take the risk of launching their own ventures. On a positive note, it is worth mentioning that DIFC has adopted its own Insolvency Regulation which incorporates many principles from bankruptcy laws enforced in Western countries and applies to all business entities operating in that free trade zone.

According to the 2013-2014 GCR, other challenges the UAE needs to address to enhance its competitiveness are associated with the national healthcare system and environmental performance. Although the UAE is considered to be a moderately sustainable country, its high pressure on water resources along with high carbon dioxide emissions reveal some weaknesses in this regard and need further improvements. Further initiatives should be undertaken for enhancing the quality of healthcare delivery in the UAE and inducing the residents and organizations to become more conscious about the natural environment by embracing green management practices to conserve energy and reduce carbon footprint (Cornell University, INSEAD and WIPO, 2013).

CONCLUSION

The UAE has been growing steadily over the past decades achieving one of the highest GDP in the world. The country's economic development has been possible largely due to its emphasis on building macroeconomic strength, political stability, reliable institutions, state-of-the-art infrastructure and knowledge-intensive clusters (World Economic Forum, 2013). The UAE has been engaging in a variety of diversification strategies to move away from its dependency on natural resources and to transition to a knowledge-based economy. These efforts translated in the enhancement of various industrial sectors in the country such as tourism and hospitality, renewable energy, financial services, real estate, aerospace, nanotechnology, biotechnology and information technology (World Economic Forum and European Bank for Reconstruction and Development, 2013). Despite multiple successes that allowed the UAE to increase its international rankings, many challenges still ought to be addressed, particularly in the field of innovation, for sustaining a comparable pace of growth in the long run.

Having conceptualized a futuristic theme of 'connecting minds, creating the future', the emirate of Dubai has recently won the bid for hosting the World Expo in 2020, becoming the first MENA city in the history to host this prestigious event. According to the Global Investment House (2013), Dubai will allocate US$ 8.1 billion to develop new infrastructure beyond the ongoing infrastructure projects to be finalized within the next 10 years which account for US$ 705 billion worth of investment. World Expo 2020 is expected to generate average rents of US$ 30 billion, create about 250,000–300,000 new jobs and increase the GDP of Dubai by near 2% over the coming years. The UAE government aims to accomplish its vision of becoming the preferred hub for global aerospace, tourism, finance and trade (Swift, 2013) and a center for innovative undertakings where talents from all over the world could engage in the creation of new technologies. The realization of these aspirations for enhancing the UAE's level of competitiveness and innovation will undoubtedly require more scientific research and academic inquiry for assisting local policy makers in designing relevant reforms needed for securing a sustainable development.

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Surviving The Crisis: An Empirical Study of Capabilities And Competitive Advantages of Small And Medium-sized Enterprises

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ABSTRACT

How to entrepreneurial firms create and sustain competitive advantages despite widespread shocks such as the global financial and economic crisis? What are the proactive moves and pre-emptive strategies they use? Using the data from in-depth interviews with 50 entrepreneurs operating in the manufacturing and business services sectors in Australia, this paper aims to explore and analyse the creation and sustenance of competitive advantage. Data and discussion reveals similarities as well as differences among both sectors. The implications are useful for entrepreneurs, policy makers and researchers.

Keywords:competitive advantage; capabilities; manufacturing; business services; global financial crisis; Small and medium-sized enterprises; Australia

INTRODUCTION

The global financial crisis (GFC) during 2007-10 had a strong negative impact on real economic performance of small and medium-sized enterprises (SMEs) (OECD, 2012: 23) and resulted in enormous costs to the economies of many countries (Conyon, et al., 2011). SMEs account for 99.7% of the 2,051,085 actively trading businesses in Australia as at June 2009 (Commonwealth of Australia, 2011). Used in conjunction with the number of business entries and exit [a rough proxy for Schumpeter's creative destruction], where Australia ranked 2nd for starting a new business and 12th for closing a business, (Commonwealth of Australia, 2011) the minimal barriers to entry and exit is evident. Of the 299,123 new business entries during the 2008-09 financial year, 76 per cent were operating in June 2010, 61 per cent were still operating in June 2011 and only 51% continued to operate in June 2012, with small business accounting for 96 per cent of these businesses in June 2012 (ABS, 2013). The Australian Banking and Finance (2011) publication reported that the number of Australian businesses entering external administration increased by 6.3% in the June 2010 quarter and firms with 10 to 99 employees accounted for 23.3 per cent of all administrations during this time. Generally, the GFC is generally seen as comprising three distinct economic stages: pre-crisis (2007), crisis (2008-09) and recovery (2010) (OECD, 2012). Most governments have responded to what was perceived as financial difficulties, by financial policy measures, aimed at alleviating working capital shortage, reducing and easing tax payments, ensuring procurement payments procedures, and enhancing SMEs access to liquidity especially to bank lending, strengthening pro-investment measures and strengthening capital base and private equity and venture capital (see OECD, 2009, p.38 for a list of various policy measures by OECD and non-OECD countries). However, there is a dearth of literature on the non-financial and organizational capabilities of the SMEs before the crisis struck. An in-depth analysis of the capabilities, strategic decisions and competitive moves of the SMEs that existed during the pre-crises period and survived the crisis will provide as excellent benchmarks for mapping competitive advantage. As Sirmon et al.'s (2010) research results showed, in spite of decades of research on competitive advantage there is a need for having a more complete understanding of the bases of competitive advantage, with a focus on multiple capabilities instead of on one or two individual capabilities so as to provide a more accurate view of the relationship between capabilities and competitive outcomes.

The main aim of this study is to examine the capabilities of SMEs and explain how these capabilities create and sustain competitive advantage. The study is based on an in-depth analysis of fifty SMEs and was conducted in the pre-crisis and during crisis periods of 2007-2008.

This paper has three key contributions. Firstly, the findings from this study outline how the firms positioned themselves as well as how they sustained their competitive advantages. The outcome is thus more comprehensive and holistic. As Sirmon et al (2010:1404) observed 'research is needed to show how changes in capability sets, over time directly affect the firm's ability to gain or sustain a competitive advantage'. Secondly, while extant research clearly demonstrates the importance of many complex, aggressive moves for large firms, it is unclear whether these findings generalize to moves in small and medium-sized entrepreneurial firms (Katila, et al., 2012:117). The findings from this study are a much needed addition to the literature as it includes two major SME sectors, namely manufacturing and services, contributing to further generalizability of extant studies. As pointed out by scholars (Sirmon et al, 2010), there is a need to extend research to examine the capabilities of service firms to determine if the results of the manufacturing study generalize to other industries. Thirdly, the results highlight the role of specific capabilities such as technological, marketing or the entrepreneur's functional competency in creating competitive advantage. As Wilden et al. (2013) observed recently, opportunities exist to investigate potential mediating mechanisms as it is possible that dynamic capabilities influence

performance through specific organizational capabilities such as technological or marketing or top management team competencies.

The next section briefly reviews the relevant literature on capabilities and competitive advantage. Based on the literature review, a theoretical framework is chosen. The methods section follows. The framework forms the basis of data analysis which is presented under the findings and discussion section. The final sections present the limitations and areas of future research and implications for theory and practice.

REVIEW OF LITERATURE

Although the term competitive advantage is used extensively in academic literature, there is a compelling need for understanding the sources and sustainability of competitive advantage with reference to SMEs and particularly so for Australia. For instance, a search in EBSCO Host in 2013 for the period 2000-2014 yielded 25,057 scholarly peer-reviewed articles. However, when the filter 'small and medium-sized enterprises' was applied, there were 756 articles which dropped to 42 articles when 'Australia' was added to the search filter. Similarly, when the filter 'manufacturing' was added to the search terms, only 6 articles were returned and when the filter 'services' was added 2 articles were returned by the search.

The major approaches used by management scholars to explain temporary and sustainable competitive advantages are the structural approach (Porter, 1985), the resource-based view (RBV) (Barney, 1991), dynamic capabilities approach (Teece, et al.,1997) and mixed approaches using combinations of the RBV and dynamic capabilities (Makadok, 2001). The structural approach postulates that strong and secure market positions in an attractive industry translate into competitive advantage (Ma, 2000:16). The RBV looks at assets instead of the structures and suggests that some firms achieve better performance than others because they possess resources that are valuable, rare, and difficult to imitate and substitute by competitors (Zhao, et al., 2012:3). However, resource-based literature has not been able to clearly articulate what constitutes resources and how resources are converted to competitive advantages (Kraaijenbrink et al., 2010). This research gap led to the prominence of dynamic capabilities approach which focuses on the dynamism in the competitive environment. It is defined as the firm's ability to integrate, build, and reconfigure internal and external competences to address rapidly changing environments (Teece, et al., 1997; Zahra et al., 2006). Makkonen et al. (2014:2707) citing scholars explained that 'dynamic capabilities emphasizes the need for firms to change their resource and capability base to counter inertia inherent in routines that effectively prevent them from observing external environmental changes and adapting to them'. Others have argued for a combination of both resource-based and dynamic capabilities methods as the 'two mechanisms do not act independently of each other' (Makadok, 2001:391). Ma (1999) proposed an alternative framework that integrates both proactive efforts in enhancing a firm's competitive advantage, namely, ownership, access, and proficiency, and pre-emptive efforts in stalling rivals' progress. It also integrates resources, capabilities and factors in the external environment, e.g. market position and partnerships. For instance, proficiency and superior capability are often based on possession of unique resources. Learning and imitation are often dependent on appropriate access. Thus, the three generic sources should be consulted both individually and collectively to analyse a firm's competitive advantage.

From the above review of literature, it can be seen that Ma's (1999:261) framework combines both the RBV and dynamic capabilities and links it to competitive advantages. It thus includes the fine-grained individual competencies as well as the over-arching major sources of competitive advantages. Hence this framework has been chosen as the theoretical lens for this study and is provided in Table 1. Using the above framework allows us to glean the capabilities set for the individual firms in the sample. For example, ownership-based pre-emptive capability building would include practices and systems developed within the firm to gain advantages through sabotage and restrict the rivals from progressing further. A few examples demonstrating this practice was found in the data. Similarly, proficiency-based creation-oriented capabilities refer to the knowledge and skills developed in the firm which enables it to conduct its business processes more effectively and efficiently than its rivals. Whilst access-based capabilities are sourced externally, proficiency-based capabilities are primarily developed within the firm. So too, developing a capability to tap into the resources, knowledge and expertise of other businesses and partner network would indicate the capabilities set in the access-based creation-oriented category.

Table 1: Theoretical framework

	Creation-Oriented	**Pre-emption-Oriented**
Ownership-Based	Actively acquire valuable assets	Constrain rival's options in acquiring valuable assets
Access-Based	Build gateway for access	Deny or limit rival's access
Proficiency-Based	Foster organizational learning and refine routine	Discourage rival's learning and imitating

Source: Ma (1999: 261)

The data and findings demonstrate the application of the framework.

METHOD

This research aims to examine the capabilities of SMEs and explain how these capabilities create and sustain competitive advantage. This research objective is best achieved by interview data and qualitative analysis which is based on textual data, drawn from researchers' observations and interviews and is textured, nuanced, and elicits three dimensional mental images (Bansal, 2012:1). Wang and Ahmed (2007:27) supported qualitative studies as they have discovered firm or industry-specific processes and capabilities pertinent to dynamic capabilities and are indeed the basis of theory building of dynamic capabilities. Pettigrew (2012:2) citing Lee (1999) observed that 'the best qualitative work is contextually grounded and seeks to understand process dynamics and not just outcomes'. Above all, the qualitative researcher is the carrier and interpreter of the lived meanings of the key people in the study. Furthermore, the focus of this study was to understand the 'processes of competitive advantage. Qualitative research can expose new questions by revealing patterns in the data as it is grounded in the phenomena, especially if prior theory is incomplete or inaccurate (Bansal, 2012:2).

■Sample and Data

The Australian Bureau of Statistics (ABS, 2001) defines a small business as one with 0–19 employees and a medium-sized business as one with 20–199 employees. The Dun and Bradstreet (DNB) Business Who's Who database was used with "Manufacturing', 'Business Services', 'Victoria' (an Australian State) and '0-199 employees' as filters which yielded 1092 firms. Firms were selected at random from the manufacturing and business services sectors, the study was described and participation in the interview requested. During the allocated time-period of 6 weeks for data sourcing, 105 firms were contacted of which 51 agreed to participate, translating into a response rate of 49%. Data sourcing was stopped at this point. Firm 33 was omitted from this study as the data was not usable, yielding a final sample of 50 SMEs, with 25 firms in the manufacturing and 25 firms in the business services categories. The one to two hours interviews were conducted during June 2007- Dec 2008 by the author at the participants' offices. The interviews were digitally recorded and transcribed.

FINDINGS AND DISCUSSION

■Manufacturing SMEs

All 25 firms invest in up-to-date manufacturing techniques and systems. Technological capabilities include the ability to offer their customers an 'end-to-end' process from product conception to after-sales support and safeguard it through patents. "Our capability is to keep up with the latest technology and of course investing in world-class equipment, in productivity and quality of the work" (Firm 39). "Our core capability is our technical know-how and the equipment that we manufacture. We are one of the very few manufacturing companies of this type in Australia. We are a niche market provider" (Firm 51). "We are well beyond anything that you've seen in the marketplace. We have rarely if ever, made a product that somebody else has already made. Our capability is to make a product from conception to sale, all the way through" (Firm 40). "We create a high- end, unique, high performance, premium product range for the niche market" (Firm 16). Continuous innovation was cited as a key capability by all 25 manufacturing firms. One intriguing capability that sustained the innovation was the 'competitor watch' and 23 out of the 25 firms engaged in it on a regular basis. "Innovation is at the heart of the firm operations. If you don't innovate, then you will go out of business. It's the ability to come up with pioneering products reasonably quickly and put them to the market fairly quickly. And we have done that from the beginning, from, you know, the very first products" (Firm 40). "Innovation is extremely important. It is something we spend a lot of time and effort on. We really try and target our innovations. To do this, we go to trade shows, we have a look at what other industries are doing, we consider how they are doing things and see if there are applications within our industry" (Firm 27). "We look at what's happening with our competition. We regularly look at our competitors' websites and websites of other companies that are relevant to our sector as well. We look for innovation and print it off and we give it to everyone in the office. We do a competitor analysis. It is systematic. We have somebody there dedicated to scanning the market and they present the analysis. We also track our competitors in the international markets. This is really important. We trawl through their creative work that might be up to 20 or 30 years old to look at what they have done that's been really successful for them and we learn from those" (Firm 3).Some firms went to the extent of buying up equipment that they anticipated their competitors to use, in their attempts to forestall competition. The state-of-the-art technologies they have invested in allowed them to develop another capability: producing cost-effective high-quality products. Twenty two out of twenty five firms stated that efficiency of production and high quality products were key capabilities. "There's a very high market expectation of quality. The products that we manufacture are also available from many sources around the world, so we rely on producing a high quality product and producing it in a timely manner and in a cost effective manner. We balance cost and quality" (Firm 30). "The business is really driven by providing high quality and short lead times on production. It is excellent value" (Firm 21). "We try to put as much value into the machines without making them

overly expensive. We are conscious of it and we are always trying to get costs down but it can't be costs down at the sacrifice of quality" (Firm 27).

Another important capability mentioned frequently (20 out of 25 firms) was, 'exceeding the expectations of customers'. Sometimes our customers are surprised that we can achieve better than what they are after, which makes them a lot happier. They might have already quoted on it, so they get a bonus in the job. We are proving ourselves to be the best supplier for our customer by supplying on time and ahead of schedule with 100% accuracy. If we bugger it up, we will replace it or rework it at our cost and get it right so they are not out of pocket. We might lose a bit on that one; but so what; we'll do it better next time" (Firm 7). Knowledge and skills of the firm and organizational culture was yet another important capability. "Our core capability is our very high degree of internal knowledge and skill in manufacturing" (Firm 31). "We try to be very approachable for our customers; we try to listen to their complaints if they have them, or to their suggestions. As much as possible we try to be a friendly, easy-to-work-with company" (Firm 27). "We are very inclusive of all our staff so innovation can come from within the business" (Firm 31). Other crucial capabilities include personal relationships with subcontractors, suppliers, industry groups and trade associations. "As we are a niche market operator, we need to create a demand. We first create awareness, then acceptance and then the demand by meeting retailers and suppliers and building relationships with them" (Firm 16). These partner relationships supply innovative ideas, provide access to new customers and lead to inter-industry knowledge-transfer. In particular, the trust built up over the years allowed the firms (19 out of 25) to outsource their non-core activities to their domestic partner network and free up the firm's resources for core activities. Table 2 classifies the data on the basis of the theoretical framework.

Table 2: Capabilities and competitive advantages of manufacturing SMEs

	Creation - Oriented	**Pre-emption - Oriented**
Ownership Based	Actively acquire valuable assets Unique/niche/specialty offerings Efficient lead-time and delivery End-to-end offerings Technological superiority Exceeding customer expectations CRM and databases Organizational culture	Constrain rival's options in acquiring Valuable assets Patents and copyrights Buying up available old equipment on sale even if unsuitable Intense competition-watch Long-term contracts with customers
Access Based	Build gateway for access External sources of innovation Subcontracting non-core capabilities Personal contact with customers Targeting a range of industry and business sizes	Deny or limit rival's access Careful not to form partnerships with or disclose Information to competition Creating tight industry networks which exclude direct competitors
Proficiency Based	Foster organizational learning and refine routine Benchmarking to best practice Professional training for employees Innovate internal systems & practice Organization culture to facilitate innovation and understand customer needs Ability to educate customers and anticipate customers' needs	Discourage rival's learning and imitating Employee education and training Continuous innovation Experience and knowledge of the market difficult to imitate by competitors

■ Business Services SMEs

The services sector was unanimous in stating their customer-centric capability (24 out of 25). These firms provided a 'one-stop-shop' by developing the complete range of integrated skills. This includes systematically building the capabilities to deliver cost-effective and high quality customized service, engage in frequent and pro-active communications with customers, quick after-sales services and regularly evaluating customer satisfaction. "I would say our business works because of the relationships I have with my clients. They trust me and I have delivered value to them" (Firm 38). Delivery of a fast, high quality, cost effective service is another integrated capability set mentioned by 22 firms. "We pride on our instant professional service capability" (Firm 49). "Our core capability is that we are able to produce a high quality design at a cost effective price" (Firm 46). "It's the speed with which we are able to supply to the market and at reasonable prices" (Firm 22). The above capability set leads to a crucial competitive advantage, namely, long-term contracts.

Knowledge and skills is the most mentioned proficiency-based creation-oriented capability. The owner-entrepreneurs demonstrate long hours of practice to systematically build the capability. "I have perfected my sales technique. I have worked really hard many years on my presentation techniques" (Firm 26).The services firms frequently mentioned the creation of an organizational culture of excitement as a key capability. "If I don't hear some laughter out the back or somebody jumping up and down with excitement, that's a bad sign. We focus upon the pioneering aspect of excitement"

(Firm 1).Integrated external and internal procedures and systems to ensure high accuracy was another capability mentioned by 15 firms. "We work closely with our customers and partners. We don't go by price, we go by quality. What we try and do is to find the customer's problem and solve the problem" (Firm 10). "We can make a guarantee 99.8% in accuracy and no one else can boast those figures. We have been doing it for five years- flawlessly and without an error" (Firm 8).In short, the capabilities for sustainable competitive advantage are summed up by this firm: "Customers appreciate our attention to detail, on quality, on actually delivering a value-for-money solution every single time we touch a customer and being able to repeat that. Our customer base gives us our reputation. They are all interlinked, they are all wound together. That's really what gives us an advantage in the marketplace, and longevity. The fact is we have been around for several years and are financial stable which is very rare for a small business (Firm 1). Table 3 categorizes the data using the theoretical framework.

Table 3: Capabilities and competitive advantages of business services SMEs

	Creation - Oriented	**Pre-emption - Oriented**
Ownership Based	Actively acquire valuable assets Organizational culture Management of internal business processes Long-term customer relationship Integrating a range of firms offerings	Constrain rival's options in acquiring valuable assets Patents/Intellectual property rights Niche positioning Economies of scale
Access Based	Build gateway for access Partnering with suppliers Accessing customers directly without sales staff; systematic and regular contacts Marketing and promotional strategies	Deny or limit rival's access Difficulty in brand switching Partnering with some competitors
Proficiency Based	Foster organizational learning and refine routine Customer-centric Experience, knowledge & skills Integrated internal and external systems & procedures to ensure accuracy Fast Delivery and after -sales service	Discourage rival's learning and imitating Organizational culture to manage innovation Professional training & development for employees Organizational leadership

Thus, the analysis of both manufacturing and business services SMEs reveals some common capability sets, namely, high quality products/ services, fast and customized delivery and very high degree of accuracy leading to long-term relationship with a high degree of retention. These capabilities create informal switching costs for customers despite the fact that none of the firms in the sample had any formal switching costs built into their process. This finding is confirmed by an ABS study which found that captive market was reported by 13% of total SMEs and was most prevalent among businesses with 0-4 persons employed (ABS, 2010). The findings on integrated offerings confirm the findings in the literature (Sirmon et al., 2010: 1392) that 'in order to effectively compete against rivals, firms must complete many tasks that in combination contribute to the satisfaction of end-users as well as owners' wealth'.

LIMITATION OF THE STUDY AND FUTURE RESEARCH DIRECTIONS

As with studies based on small samples, this study has limitations which provide the basis for future research directions. This study is based on 50 SMEs from one State in Australia and may suffer from clustering biases. A larger sample that includes a wider population is needed for generalizing the findings. Caution should be exercised when linking the capability sets to competitive outcomes. A longitudinal study would be more suited to track the path from capability building to competitive advantages. Statistical modeling can be used to better understand the cause-effect relationships. Although this study built on prior research and as such has demonstrably provided an extension to the literature on SME capabilities, the small sample used is likely to have not captured some capabilities.

IMPLICATIONS AND CONCLUSION

This paper has presented convincing arguments to highlight the interwoven and recursive process of capabilities in SMEs. It has offered a method to empirically study the complex link between capabilities and competitive advantages, especially in dynamic environments such as the onset of financial and economic crisis. Several scholars have observed that the effects of dynamic capabilities on firm performance are context-dependent (Wilden et.al, 2013). By focusing on SMEs in a specific region in Australia, and within two of the most important industry sectors, a more accurate picture of the context can be inferred. The study has mapped the data from in-depth interviews against a framework from the literature and demonstrated the potential for further research which can validate and develop frameworks. The discussion highlighted how the SMEs continuously focused on retaining their competitive advantage. As Sirmon et al. (2005:1405) observed, 'rivals are continuously searching for ways to overcome their competitors' competitive advantage. As such, all firms must continuously develop their capabilities, requiring ongoing investments'. Data indicates some key differences between micro, small and medium-sized firms in the manner in which they build capabilities, the set of capabilities they focus on retaining and the competitive outcomes. This has

important implications for policy makers as one-size-fits-all support measures may not be appropriate. The data also highlights specific governmental support such as training in CRM and other database management skills instead of just financial support to further increase the SME competitiveness in their economies.

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Critically Evaluating The Effect of Consumer Impulsiveness, Self-Monitoring And Optimum Stimulation Level on Impulse Buying And Variety Seeking

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ABSTRACT

The objective of this study was to examine how consumer impulsiveness, self-monitoring, and optimum stimulation level affect impulsive buying and variety seeking behavior among Malaysian consumers. This study employed a cross-sectional design and a total of 302 respondents were selected using a convenience sampling method. Findings of this study revealed that consumer impulsiveness and optimum stimulation level has a significant positive effect on impulsive buying and variety seeking. This study therefore recommends organizations and retail stores to display their goods and products in suitable, accessible, and reachable places, while keeping in mind the products that are placed on the path of consumers trigger customers' impulsive behaviors at a higher level. Building attractive showrooms and displays for products is another way in which to increase sales, due to the stimulation of customer's impulse buying and variety seeking behaviors.

Keywords:Consumer Impulsiveness, Self-Monitoring, Optimum Stimulation Level, Impulsive Buying, Variety Seeking Behavior, Malaysian Consumers

INTRODUCTION

One of the most commonly debated issues in business today is impulse buying behavior. This topic is being studied in different areas like marketing, consumer behavior and consumer satisfaction strategies. A study conducted by Kacen and Lee (2002) noted that, in the United States, the profit made by shop owners due to the unplanned purchases of items such as magazines and candy amounts to a sum of more than a staggering four billion dollars. Impulsive buying is driven by promotion strategies, which may make consumers ambivalent and trigger the need to make a purchase immediately (Yang, Huang and Feng, 2011). Examining the factors that influence impulse buying has therefore become a crucial aspect of understanding consumer behavior.

Impulsive buying is a consumer's tendency to buy spontaneously, unreflectively, immediately and kinetically (Rook and Fisher, 1995). Impulse buying is buying behavior which is unplanned and unreflective. With this in mind, one can see why this topic is of great importance and can be a winning ticket to success for suppliers everywhere. Impulse buying is among the topics, which is mostly discussed in developed countries such as the US, but no real attention is paid to it in second world countries. The limited number of research studies and existing evidence regarding this issue in developing countries testifies to this fact. This could be due to the fact that the high income of people in developed countries has led shopping to be an integral part of their lives, therefore impulse buying occurs more in those places.

While taking into account that there is no theoretical outline regarding this issue, this study has concentrated on three influential factors in consumer's behaviors. The selected factors are (a) Consumer Impulsiveness (CI), (b) Self-Monitoring (SM), and (c) Optimum Stimulation Level (OSL). This study examined the relationships between these factors and their effects on impulsive buying, as they may hold important points which can benefit sellers, buyers, and also society as a whole. This study investigated the connections which exist between the consumer traits mentioned above (CI, OSL, and SM), and impulsive buying and variety seeking, especially in Malaysia's retail industry.

LITERATURE REVIEW

■Optimum Stimulation Level

Impulse buying is an emotionally charged and highly stimulating experience (Rook, 1987); hence there could be a positive association between OSL and level of impulse buying. Similarly, variety seeking is all about trying new experiences just for the sake of change and does not always reflect any rational benefits, which means there could be commitment in exploration such as risk-taking or novelty-seeking involved in impulse buying, and a level of impulsiveness or spontaneity associating with variety seeking. Eysenck (1993) proposes a general arousal theory that states that an individual's level of impulsiveness is appositively related to level of arousal, which means that the highly impulsive are chronically lower in arousal compared to low impulsive. On the other hand,

individuals with high OSL are also lower in their arousal level making them indulge in sensation seeking activities (impulsive buying) to achieve their optimum stimulation level (Raju, 1980; Steenkamp and Baumgartner, 1992). In fact, individuals with low arousal levels are often pleasure seeking, sensation seeking, careless, impatient, and risk-taking (Dickman, 2000).

Therefore, it is generalised that individuals with low arousal levels (who can be stimulated with little effort) are more likely to indulge in impulse buying and variety seeking behaviours, because it would provide the extra stimulation that high OSL individuals need in order to reach their OSL. On the other hand, low OSL individuals with high arousal levels experience less impulse buying or variety seeking (Rook, 1987).

From the consumer context, OSL is positively correlated with a wide variety of exploratory behaviours such as trying new products, changing brands, risk taking, and seeking for information out of curiosity (Raju, 1980). This explains why high OSL individuals with lower levels of arousal are found to be satisfied most by risk-taking behaviours, followed by variety seeking and information seeking (Raju, 1980). Prior research has focused on OSL as an embedded attribute of an individual, and the findings have concluded that people who are high in this attribute engage more in exploratory behaviour compared to others with low level of OSL (Steenkamp and Baumgartner, 1992).

OSL and variety seeking is positively associated and famous in consumer research (McAlister and Pessemier, 1982; Steenkamp et al., 1996). Variety seeking tends to give an individual a novel and exciting purchase experience, a change of pace and relief from boredom, and on top of that, it gives an opportunity to satisfy one's desire for greater stimulation (Baumgartner & Steenkamp, 1996). In short, it provides consumers with a solution to engage sensory and cognitive stimulation. However, there is little research explaining the association between OSL and impulse buying, the influence of the actual level of stimulation, and the role of the discrepancy between the actual and optimum levels of stimulation in explaining exploratory behaviours in general.

■ Self Monitoring

Self-monitoring is the tendency to change or adjust one's behaviour in response to others' presence or behaviour (Becherer and Richard, 1978). Researchers found that SM is one of the important variables that bridge the relative influence of traits and/or situations (Bearden, Netemeyer and Teel, 1989; Darley and Lim, 1992; Hogg et al., 2000). High self-monitors tend to adapt their behaviour to reflect different roles based on varying situations. Low self-monitors tend to be their own self rather than pleasing those around them, and to be true to their own attitudes and values across different situations. These different traits lead low and high self-monitors to show different behaviours in various consumer behaviour contexts. For instance, high self-monitors seek more variety in public to show themselves as more unique and creative individuals (Ratner and Kahn, 2002).

Consumers tend to look at impulse buying as being generally wrong; something which makes them feel bad about their purchase decision, something which leads to guilt and negative evaluation of purchase decision (Dittmar and Drury, 2000; Rook, 1987; Trocchia and Janda, 2002). Consumers concerned about their self-image with high SM are stronger in controlling their impulses compared to low self-monitors due to their desire to appear rational and prudent (Luo, 2005).

High and low self-monitors also behave differently when faced with a decision about how much variety to seek in public. High self-monitors tend to seek more variety compared to low self-monitors to show to others that they are interesting and creative individuals (Ratner and Kahn, 2002). This instinct to appear interesting may be stronger than the instinct to make a reasonable and appropriate decision (Lerner and Tetlock, 1999). In short, consumers with higher OSL are likely to seek greater variety if they happen to be high self-monitors, compared to low self-monitors with similar OSL level. However, even at lower levels of OSL, high self-monitors tend to seek greater variety because their desire to appear more positively in the eyes of others may make them overcome the influence of lower levels of OSL.

■ Consumer Impulsiveness

Consumer impulsiveness (CI) is a famous theme in Western countries, and it continues to gain significant attention from researchers, particularly consumer researchers (Dholakia, 2000; Sengupta and Zhou 2007; Vohs and Faber 2007). Prior research concludes CI as a consumer trait and uses different names for it, such as consumer buying impulsivity (Youn and Faber 2002), impulse buying tendency (Verplanken and Herabadi 2001; Weun, Jones, and Beatty 1998), consumer impulsiveness (Puri 1996) and buying impulsiveness (Rook and Fisher 1995).

This is consistent with trait theories in psychology: impulse buying tendency trait assumes that a consumer's impulse buying tendency is constant, reoccurs stably and acts as a generalized causal effect on impulse buying behaviour (Allport, 1937; Mischel, 1973; Rook and Fisher, 1995). This means, consumers with high impulse buying tendency would demonstrate a general tendency to purchase certain items of all product categories on impulse. Consistent with this general assumption of impulse buying tendency, previous studies have focused on consumers' impulse buying tendency in general as buying goods, not focusing on a particular product categories (Beatty and Ferrell, 1998; Rook and Fisher, 1995; Rook and Gardner, 1993; Weun et al., 1998).

Recently, researchers have investigated CI in China (Zhou and Wong 2003), Australia, Hong Kong, Singapore, and Malaysia (Kacen and Lee 2002). These studies used scales developed for the U.S. market, which could not establish measurement equivalence across different cultures (Kacen and Lee, 2002), or did not attempt it at all. So, it is still unclear if CI has the same effect across different cultures and if the scales developed with consumers in Western cultures are valid and reliable in other cultures.

RESEARCH METHODOLOGY

This study measures the three independent variables (CI, OSL, and SM) using the well-established Consumer Impulsiveness (CIS) scale (Puri, 1996), the Change-Seeking Index (CSI) scale (Steenkamp and Baumgartner, 1992) and the Self-Monitoring Scale (Lennox and Wolfe, 1984; O'Cass, 2000) respectively, all with seven-point Likert-type response formats (ranging from 1=strongly disagree to 5=strongly agree).

Respondents consisted of consumers who had made purchases before filling out the trait-scales response. This was in order to make sure the respondents had reached the levels of impulse buying and variety seeking rather than asking them directly, which would have reduced the demand effects to some extent. It included several control variables such as total amount of money spent, gender, age, occupation, and shopping list as covariates in the data analysis to account for any possible unwanted effects of these variables.

Using Beatty and Ferrell's (1998) approach, first the shoppers described each of their purchases as planned or unplanned purchases. To avoid the reminder-type items, the researchers asked the participants: "When you saw this item, were you reminded that you were out of this item and needed it?" Only those purchases considered as pure impulse purchases, which were unplanned and not listed as reminder purchases, were counted. The number of pure impulse purchases were divided by the total number of items bought as a measure for the level of impulse buying for each shopper.

Next, using Van Trijp et al. (1996) approach, the researchers asked the participants if they had switched from their regular brand or flavour for each of their goods purchased. If there was a switch, the researchers asked them if they had switched to a new brand because of any specific reason such as a discount, or without any specific reason just for a change (pure variety seeking). Only those goods bought with no specific reason for switching were accepted as variety seeking purchases. Finally, the number of variety seeking purchases was divided by the total number of purchases as the measure for the level of variety seeking for each shopper.

■Research Hypotheses

The following three hypotheses were formulated and tested:

Hypothesis 1: Consumer impulsiveness has a positive effect on impulse buying and variety seeking.
Hypothesis 2: Self-monitoring has a negative effect on impulse buying and variety seeking.
Hypothesis 3: Optimum stimulation has a positive effect on impulse buying and variety seeking.

■Sampling

In this study, target population was the local Malaysian customers of some popular retail stores in Malaysia including Carrefour, Tesco and Jusco. This study employed a convenience sampling method.

Based on nature of this study, it was not possible to know the exact size of the population. Based on the nature of inferential statistical test used to test the research hypothesis, this study collected data from a total of 302 respondents. All data was gathered within two months from Jusco, Tesco and Carrefour during the week days excluding weekends and public holidays.

DATA ANALYSIS

■Demographic Characteristics

The total sample for this study consists of 302 individual Malaysian customers. As presented in Table 1, 222 respondents were between 18 to 29 years old, representing 73.5% of the whole survey population; 44 respondents were between 30 to 39 years old, representing 14.6% of the whole survey population; 23 respondents between 40 to 49 years old, representing 7.6% of the whole survey population and 12 respondents between 50 to 59 years old, representing 4% of the whole survey population and only 1 respondent was 60 or more years old. The highest frequency belongs to the first group.

Table 1: Respondents Age

	Frequency	Percent
18-29	222	73.5%
30-39	44	14.6%
40-49	23	7.6%
50-59	12	4.0%
≥ 60	1	0.3%
Total	302	100%

As noted in Table , 189 respondents representing 62.6% of the whole survey population were male whereas 113 respondents were female representing 37.4% of the total number of respondents.

Table 2: Sex

	Frequency	Percent
Male	189	62.6%
Female	113	37.4%
Total	302	100%

As shown in the Table 2, 59.60% of all respondents earned less than 3000RM per month while 27.81% of all respondents earned between 3000RM to 5000RM per month. Only 12.58% of all respondents earned more than 5000RM per month.

Table 3: Respondents Income

	Frequency	Percent
Up to 3000 RM	180	59.6
Between 3000RM to 5000RM	84	27.8
More than 5000RM	38	12.6
Total	302	100.0

■Reliability Analysis

Cronbach's Alpha measures the internal consistency of items used to measure each variable. As presented in Table 4, the Cronbach's alpha for consumer impulsiveness, self-monitoring, optimum stimulation level, and variety seeking is more than 0.7, indicating an acceptable level of internal consistency among the items used to measure the indicators.

Table 4: Reliability Test

Items	Cronbach's Alpha
Consumer Impulsiveness	.716
Self-monitoring	.798
Optimum Stimulation Level	.761
Variety seeking	.703

■Multiple Regression Analysis

Multiple regression analysis is the statistical test that was used in order to examine the above explained relationships. Before performing the multiple regression analysis some assumptions must be examined. These assumptions are multicollinearity and normality assumptions.

Table 5, below, presents the correlation analysis for independent and dependent variables. There is a moderate correlation (.583) between consumer impulsiveness and impulse buying and variety seeking. Self-monitoring has a strong correlation (.712) with impulse buying &variety seeking. The correlation between optimum stimulation level and impulse buying &variety seeking is moderate (.549). There is no correlation coefficient above 0.9 which indicates there is no multicollinearity.

Table 5: Correlation Coefficients

	Impulse buying & Variety seeking	Consumer Impulsiveness	Self-Monitoring	Optimum Stimulation Level
Impulse buying &Variety seeking	1.000			
Consumer Impulsiveness	.583	1.000		
Self-Monitoring	.712	.276	1.000	
Optimum Stimulation Level	.549	.248	.334	1.000

The *p* value of Shapiro-Wilk test of normality is 0.1.3, which is more than the chosen 5% level of significance indicating that the distribution is normal.

Table 6: Test of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Standardized Residual	.044	302	.200*	.985	302	.103

Table 7, below, presents the summary of the model. The multiple correlation coefficient (*r*) is 0.744. The R-squared (r^2) value shows the proportion of variation in dependent variables explained by the independent variables. In this model, the three independent variables, i.e., consumer impulsiveness, self-monitoring, and optimum stimulation level explain 55.4% of the total variation in impulse buying and variety seeking.

Table 7: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
.744[a]	.554	.545	.66090	1.834

The unstandardized and the standardized coefficients of the multiple regression analysis are presented in Table 8 below. The p-values for all predictors namely, consumer impulsiveness, self-monitoring, and optimum stimulation level are .001, .000, and .025 respectively. All the values are less than chosen 5% level of significance.

Table 8: Regression Coefficients

	Unstandardized		Standardized	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.144	.193		5.936	.000
Consumer Impulsiveness	.346	.072	.292	3.407	.001
Self-Monitoring	.481	.075	.416	3.731	.000
Optimum Stimulation Level	.243	.064	.229	2.250	.025

- Testing Hypothesis 1

  This hypothesis attempted to determine whether or not consumer impulsiveness has a positive effect on impulse buying and variety seeking. As presented in Table 8, the results of the multiple regression analysis reveals that consumer impulsiveness is significantly and positively related to both impulse buying and variety seeking ($\beta = 0.192$, p-value < 0.05).

- Testing Hypothesis 2

  It was expected that self-monitoring would have a negative effect on impulse buying and variety seeking. As presented in Table 8, the results of the multiple regression analysis reveals that self-monitoring has a significant (at 5% level of significance) positive effect on impulse buying and variety seeking ($\beta = 0.216$, p-value < 0.05). This may be due to the difference in respondents' understanding about their level of self-monitoring and actual level of self-monitoring.

- Testing Hypothesis 3

  This hypothesis attempted to determine whether or not the optimum stimulation level has a positive effect on impulse buying and variety seeking. As presented in Table 8, the results of the multiple regression analysis reveals that optimum stimulation has a significant (at chosen 5% level of significance) and positive ($\beta = 0.129$) effect on impulse buying and variety seeking.

CONCLUSION

The outcomes of this study point towards the fact that consumer impulsiveness is significantly and positively related to impulse buying and variety seeking. In other words consumers with high levels of impulsiveness are likely to purchase more impulsively and like to have more variety in their life in comparison with those who have lower levels of consumer impulsiveness. Self-monitoring or self-controlling factors were expected to have a negative relationship with impulse buying and variety seeking. However, findings indicated an unexpected, negative and significant effect of self-monitoring on impulse buying and variety seeking. Findings also noted that the optimum stimulation level has s significant positive effect on impulse buying and variety seeking.

The outcomes show how impulse buying and variety seeking affect the behaviors of consumers in Malaysia. Consumers with high levels of "consumer impulsiveness" and "optimum stimulation level" are interested in making purchases more impulsively and like variety seeking. They generally want to overspend with higher levels of impulsiveness and also variety seeking in comparison to those consumers who have low scores. In general, compared to normal consumers, people with higher levels of impulsiveness and variety seeking like to spend money excessively.

This study also proves Baumgarthner's (2002) idea in the case of purchase behaviors. He believed that impulse buying and variety seeking are based on consumer buying behavior. Impulse buying and variety seeking are positively affected by "consumer impulsiveness" and "optimum stimulation level. This study also supports Baumgarthner's theory by viewing the various social behaviors according to impulse purchasing and variety seeking and defining the differences in their involvement levels.

■ Limitations of study

Data for this study was collected from selected retail stores in Malaysia; therefore the participants purchase behavior may not reflect the true characteristics of all customers in Malaysia. Data was collected from respondents when many of them were rushing, therefore they were non cooperative. It is possible that a proportion of the total respondents did not read the questionnaire carefully. This may have lead to a wrongful estimation.

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An Exploration of The Factors Influencing Social CRM Adoption: Evidence from Australian Firms

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ABSTRACT

Businesses around the world are placing increasing emphasis on effectively improving relationships with customers by using social media. This idea is called social customer relationship management (Social CRM) – an emerging concept that includes strategies, processes and technologies to link social media with traditional CRM processes. Despite growing attention being paid to this concept, there is very limited empirical evidence on what determines the adoption of Social CRM by private firms. Using a large-scale sample of 1,025 Australian firms, we explore several factors (firm size, industry sector, type of market served, and the perception of barriers) that may affect Social CRM adoption. We find that the uptake of Social CRM increases with firm size, and service firms are more likely than manufacturing firms to adopt Social CRM. Firms that sell to individual customers tend to adopt Social CRM more than those that sell to other companies or other divisions of their firm. Three types of barriers negatively associated with Social CRM adoption include costs outweighing benefits, rigid organisational culture and lack of management support, whilst a positive association observed for the barriers related to high financial cost and employee misuse of social media tools.
***Keywords*:** Social CRM, social media, social networking, size, sector, market, barriers.

INTRODUCTION

Recent developments in information technology and web services have increased the potential for creating digital social networks and business relationships. With the advent and rising popularity of social media, the way firms do business as well as the role that customers play in influencing products, services and corporate strategies, are being transformed dramatically. As a result, social customer relationship management (Social CRM) is emerging as a new approach that integrates social media platforms into existing CRM approaches (Woodcock, Green & Starkey, 2011). Social CRM incorporates the 'customer' strategy as part of the corporate strategy to engage customers, create meaningful conversations and thus maximise customer value. In this way, it advances the customers' experience in order to make them feel a key part of the entire business relationship.

From an organisational perspective, social media can be considered as a system that contains objects such as people, groups and other organisations linked together by a range of relationships (Askool & Nakata, 2011). The effects and opportunities of social media in organisations have mostly been evident in Web 2.0 technology through the use of social networking sites (SNSs) such as Facebook, Twitter, LinkedIn, Google+ and YouTube (Ganley & Lampe, 2009). In Australia, the Government has encouraged efforts to increase the use of Information and Communications Technology (ICT) in Australian private firms, in particular the Internet and online services, and to foster participation in online communities. Using SNSs helps create a more robust communication structure both inside and outside of the business environment, thereby opening the door to improving interactive communication between the firm and its customers as well as to build shared interaction between customers. Integrating social media into CRM therefore offers new business opportunities for firms to capitalise on.

Whilst Social CRM in the business context has been analysed increasingly in the United States and the European Union, the ability of Australian business organisations to adopt Social CRM and in particular the factors determining such adoption have been largely unexplored empirically. Although some academic and practitioner research indicates that Social CRM in Australian business is at an early stage of adoption, such research is scant and descriptive in nature (Yawised, Marshall & Stockdale, 2013). In the absence of rigorous empirical research on Social CRM, under what conditions Australian private firms adopt Social CRM remains the question of debate, thus leaving the door open for investigation.

This paper seeks to occupy this research space by providing an empirical analysis of Social CRM in Australian business, using large-scale survey data. Specifically, we aim to explore and examine several factors – *firm size, industry sector, type of market served, and the perception of various types of barriers* – that may affect the adoption of Social CRM by firms. The results of this study provide insights into our understanding of the factors that stimulate and shape Social CRM adoption. The remainder of this paper is organised as follows. The next section provides a brief review of the literature on Social CRM and its determinants and develops specific research hypotheses. This is followed by a discussion of data and methodology used. The results are then presented and discussed. The paper ends with conclusion.

LITERATURE REVIEW AND HYPOTHESES

■ Social CRM in Business Context

Social CRM differs from traditional CRM in that the former focuses on the conversations and the interactions with the customer, whilst the latter emphasises automation and software (Greenberg, 2009). With Social CRM, the organisation-customer relationship returns to its origin and take a more human form (Greenberg, 2010). In this sense, Social CRM focuses on a collaborative process by facilitating customer-driven innovations internally as well as externally using conversations held by the customers themselves (Evans & McKee, 2010). Such a process uses the information from the social web, converts it through social analytics into customer knowledge, and uses it in developing business processes. In this way, the information is tied together with the business processes, enabling the social web to do part of the job (Evans & McKee, 2010).

The differences between Social CRM and traditional CRM can also be observed on the basis of primary objectives. From an IT perspective, the primary objectives of Social CRM are to export and to extract customer knowledge from the social web application (Alt & Reinhold, 2012), while from a marketing perspective the primary objectives are to build trust and to establish customer loyalty (Acker, Grone, Akkad, Potscher & Yazbek, 2011; Greenberg, 2009; Stone, 2009; Woodcock, Green & Starkey, 2011). These objectives of Social CRM differ from those of traditional CRM in that whilst traditional CRM involves careful customer segmentation based on a macro, micro or one-to-one level depending upon their existing and potential profitability (Knox, Maklan, Payne, Peppard & Ryals, 2013; Payne & Frow, 2006), Social CRM focuses on the entire environments and experiences that engage customers. In this sense, Social CRM is more related to people and conversations than traditional CRM (Leary, 2008).

Research indicates that the key to successful Social CRM strategies lies in extending traditional CRM strategies to a firm's entire extended social network (Acker et al., 2011). As such a network is a dynamic and evolving organism encompassing many actors, it is important, at the first stage, for firms to identify social networking users (determining whether they are customers or not) and to understand web users' social behaviours (Ang, 2011). Information systems scholars (e.g. Ang, 2011; Mosadegh & Behboudi, 2011) further suggest that ideally business organisations should treat social media as a new channel within traditional CRM when engaging in Social CRM strategies. Doing so requires recognition by firms of the most appropriate types of social networking tools to be adopted in order to set themselves besides competition as well as of the proper configuration of these tools. This recognition will enable firms to extend and enhance the capability of their traditional CRM strategy with a new meaningful way of engaging customers.

In Australia, as reported by Sensis (2012), an average of Australian business investment in social media in 2012 has increased strongly over the past year in all sizes of business – with 94% of large businesses investing in structures for social media (about $100,000 AUD, up from $78,750 in 2011); 95% of medium businesses reporting an almost doubling of the proportion of their marketing budgets devoted to social media (about $16,920 AUD, up from $6,500 in 2011); and 70% of small businesses making some financial investment in social media (about $3,410 AUD, up from $2,050 in 2011). By looking specifically at the types of social networking sites, Facebook is dominantly used by approximately 80% of all businesses, regardless of size. Twitter is playing an essential part for large businesses (71%), compared to medium and small businesses (33% and 27% respectively). In all sizes of business, LinkedIn and YouTube are slightly more popular, whilst Google+ and Blogs are used by a sizable minority. However, it should be noted that despite the growing use of social media by firms in Australia, many Australian businesses are still slowly recognising the potential of using social media in conjuction with their CRM efforts (ACMA, 2012).

Due to the fact that customers are increasingly using social media to gain knowledge of a firm's product and service offerings (Sarner, Thompson, Sussin, Drakos, Maoz, Davies & Mann, 2012), it cannot be denied that in today's competitive business environment Australian firms need to engage in Social CRM (the blend of social media and their traditional CRM) in order to listen to customers, better address their needs and thus reap the benefits that such social networking trend offers.

■ Factors Influencing Social CRM Adoption

In this study, we consider four specific factors – firm size, industry sector, type of market served, and the perception of barriers – that are likely to be associated with the adoption of Social CRM by Australian private firms. We note that due to the lack of existing survey in this kind in the literature, this paper is to a large extent explorative in character.

The size of a firm has often been considered as one of the most important determinants of any innovation. The likelihood of Social CRM adoption appears to increase with firm size. Larger firms have more financial resources and skills, and therefore they are more likely to effectively manage the risks and costs associated with Social CRM adoption than smaller firms with lesser and limited resources (Cappuccio, Kulkarni, Sohail, Haider & Wang, 2012; Greenberg, 2008; Sarner, Thompson, Dunne & Davies, 2010). Whilst structural simplicity and streamlined operations may enable smaller firms characteristically to be more flexible and adaptive and thus in a better position to take

advantage of social media, resource constraints can frequently inhibit the integrating of social media and their traditional CRM in a successful way. For example, inadequate knowledge and skills faced by small firms can lead to the lack of formal mechanisms to foster behaviours supportive of Social CRM and to effectively manage social networking tools. Large firms, in contrast, have greater opportunities to reap the benefits of scale, scope and learning from their Social CRM efforts (Lacy, Diamond & Ferrara, 2012). Also, compared to smaller counterparts, large firms are more likely to feel more pressure to engage in 'two-way communication' with customers through Social CRM in order to improve brand recognition, increase market power and stay competitive. Therefore, we propose:

Hypothesis 1: Larger firms are more likely than smaller firms to adopt Social CRM.

Industry sectors are likely to matter for the adoption of Social CRM by firms. Firms in different sectors have different information-processing needs, which in turn can have an impact on their decision to adopt Social CRM (Yap, Soh & Raman, 1992). Research suggests that Social CRM may not be beneficial to all business sectors (Stone, 2009). Service sectors, due to having higher information content, are more likely to gain benefits from their Social CRM initiatives – and thus to adopt such initiatives – than the manufacturing sector with lesser information content (Keuky & Clarke, 2011; Sharma, 2011). Social CRM, in particular, enables service firms to deal with the intangibility of the service (e.g. customer satisfaction), resulting in a better communication with customers, greater efficiency and customisation of the services offered, and thus the increasing loyalty of more profitable customers (Dimitriadis & Stevens, 2008). Following the descriptive findings of a recent study by Keuky and Clarke (2011) who found that Australian businesses are at the early stage of Social CRM adoption with firms in service sectors (including financial, telecommunication, tourism, retail and wholesale, and information technology) being the first attempt to engage in such strategy than the others, we propose:

Hypothesis 2: Firms in the service sectors are more likely than those in the manufacturing sector to adopt Social CRM.

In Social CRM, the company belongs to the customers' ecosystem, where customers are no longer being seen as a target but instead as a source of all compony actions (Harrigan & Choudhury, 2012; Yawised et al., 2013). Research suggests that firms that sell to individual customers are more likely, than those that do not serve this market, to adopt Social CRM (see Harrigan & Choundhury, 2012; Sarner et al., 2012). These consumer-oriented firms often use Social CRM as a way of improving market orientation, listening to and interacting with individual customers online, gaining customer insights and translating insights into effective marketing programmes to reach potential customers (Greenberg, 2010; Lehmkuhl & Jung, 2013). A recent survey conducted by Sarner et al. (2010) found that most Social CRM solutions in the United States focus on business-to-customers (B2C), with 90% of current spending on Social CRM being for B2C use. We expect that this trend may be observed in Australia as well; therefore, we propose:

Hypothesis 3: Consumer oriented firms are more likely than non-consumer oriented firms to adopt Social CRM.

A reason for slow adoption of Social CRM among Australian business may be due to the challenge associated with such an adoption. One important challenge is how to effective harness the potential and collective intelligence of Social CRM which is constantly evolving in response to a changing environment (Ang, 2011; Chang & Kannan, 2008). Furthermore, given that Social CRM is not merely confined to the technological specification but rather involves the organisational structure, transformations in both of these areas are essentially required for successful adoption of Social CRM (Ang, 2011; Chang & Kannan, 2008). A number of barriers to adopting or implementing Social CRM have been identified in the literature. These include: the significant commitments and investments in financial resources and IT expertise (Cappuccio et al., 2012); an excess of costs over benefits (Lacy et al., 2012); time consuming to manage and monitor social media sites (Harrigan & Choudhury, 2012; Stone, 2009); security issues such as data privacy leakage (Stone, 2009); lack of support from senior management (Baird & Parasnis, 2011); organisational rigidity such as organisational culture not aligned to the new strategy (Acker et al., 2011); and the misuse of social media tools by employees which can negatively affect their productivity (Zyl, 2009). These constraints, coupled with the evidence found by the Australian Bureau of Statistics (2011) of a gradual decrease in business survival rates in Australia since 2007, may lead Australian firms to be reluctant to fully adopt or engage in Social CRM as a value-creating strategy for enhancing customer relationships. We expect that these constraints involved in Social CRM adoption might be insurmountable and consequently deter firms from engaging in such strategy. Therefore, we propose:

Hypothesis 4: The perception of barriers by firms is negatively associated with adoption of Social CRM.

DATA AND METHODOLOGY

In this study, we employed a web-based survey method for testing the research hypotheses. A web-based survey was chosen because it was considered to be a much faster and more economical means of data gathering compared to a postal survey (Joinson, 2005; Neuman, 2003). The questions included in the survey were identified from the literature (e.g. Acker et al., 2011; Baird & Parasnis, 2011; Cappuccio et al., 2012; Dutot, 2013; Greenberg, 2009; Leary, 2008; Stone, 2009; Zly, 2009) and from discussions with academic researchers and IT/marketing managers familiar with Social CRM in Australian business. Following accepted practices in CRM research (e.g. Huang & Wang, 2013; Olszak & Bartus, 2013; Payne & Frow, 2005), data were collected from CEOs or marketing/IT managers who play an important role in making decisions on Social CRM adoption.

The survey was sent during July-November 2013 to a random sample of 10,000 firms across all sizes and sectors, drawn from the population of all Australian private firms listed in the Dun & Bradstreet (Australia) database. The survey received 1,168 responses, representing an 11.7% response rate. After eliminating 108 responses with missing data and excluding 35 respondents who reported adoption of Social CRM in the past but have now terminated the use of it[1], a total of 1,025 respondents remained for analysis.

Since this study uses self-reported data with a single informant in each firm, common method bias may have augmented relationships between the variables. To test whether this was a problem, we performed Harman's single factor test (Podsakoff, MacKenzie, Lee & Podsakoff, 2003). All of the analysed variables were entered into a factor analysis using polychoric correlation matrix which is applied on binary and ordinal measures. Results showed the presence of eight distinct factors with eigenvalues greater than 1, with the largest factor not accounting for a majority of the variance (38%). Given that no single general factor emerges from this analysis, common method bias is not a major concern in this study.

■Variables

The survey defines Social CRM as "the use of social media (e.g. Facebook, LinkedInn, Twitter, SlideShare etc.) to enhance the firm's traditional CRM strategy". The dependent variable for Social CRM adoption is a binary variable, taking the value of 1 if the respondent reported the adoption of Social CRM by his/her company[2] and 0 otherwise[3].

The independent variables included in this study are firm size, industry sector, type of market served, and the perception of barriers to Social CRM. The size of a firm was measured by a number of full-time equivalent employees (under 5, 5-9, 10-19, 20-49, 50-99, 100-199, 200-499, 500-999, 1000-4999, and 5000 or more). As the sample includes firms from 7 broad industry sectors (including natural resources; manufacturing; infrastructure; retail, wholesale, accommodation and food services; knowledge intensive business services; health, education, public administration and safety; and other services), we created 6 sector dummy variables with manufacturing as the reference category. The type of market served was constructed as a binary variable taking a value of 1 if the firm reported individual customers as the important market for its products or services, and 0 otherwise (i.e. reporting either other companies or other divisions of the firm).

The questions on barriers to Social CRM asked all respondents to rate the importance of each of 11 factors as "constraints on their company's implementation of Social CRM" or as "influencing their company's decision not to adopt Social CRM", on a 5-point scale (i.e. 'factor not experienced', 'low', 'medium', 'high' and 'very high'). These factors included: "estimated financial cost is too high"; "costs outweigh the benefits"; "time consuming to manage and monitor social media sites"; "lack of qualified personnel or insufficient skills"; "lack of information on how to effectively implement Social CRM"; "lack of support from senior management"; "security problems"; "data privacy problems"; "organisational culture not aligned to the new strategy"; "technological barriers"; and "misuse of social media tools by employees". Each of these barriers was an ordinal variable, ranging from 1 to 5.

In this study, all of the respondents can have main responsibility at their firm in one of the following areas: "IT management", "Marketing management" or "Both IT and Marketing management". As heterogeneity in the respondent's main responsibility could influence the estimation results, we included two dummy variables with 'both IT and marketing management' as the reference category in order to control for confounding effects.

■Econometric Model

We model the determinants of Social CRM adoption with a binary logit model. The model estimates the influence of a range of independent variables on a binary dependent variable. The

[1]These respondents were excluded from the analysis because they can be considered as either Social CRM adopters or Social CRM non-adopters and thus can confound the study findings.

[2]A survey response of either "we have adopted and implemented Social CRM" or "we have recently adopted Social CRM and are currently in the process of implementation".

[3]A survey response of either "we have made no decision regarding Social CRM" or "we will definitely not adopt Social CRM".

parameters of the model are estimated via maximum likelihood (ML) estimation. The logit model is written as follows:

$$Y = \beta Xi + \varepsilon, \text{ where } y = 1 \text{ if } Y > 0, \text{ and 0 otherwise}$$

$$\text{Prob}(y = 1) = 1 - F(-\beta Xi) = \frac{\exp(\beta Xi)}{1 + \exp(\beta Xi)}$$

where Xi is a vector of the independent variables for the i-th observation, β is the vector of coefficients, and ε represents the vector of the error terms of the estimated equation.

RESULTS

Table 1 reports the descriptive results by sector. Of all 1,025 firms, 54.8% reported adoption of Social CRM. Sectors with the highest share of firms engaging in Social CRM include other services (69.4% of all firms within the sector) and retail, wholesale, accommodation and food services (61.5%), whilst the manufacturing sector had the lowest share of firm adopting Social CRM (39.4%).

Table 1: Descriptive statistics of Social CRM adoption by sector

Sector	N	Social CRM Adoption (% of firms within the sector)
Natural resources[1]	48	56.3%
Manufacturing	99	39.4%
Infrastructure[2]	104	49.0%
Retail, wholesale, accommodation and food services	286	61.5%
Knowledge intensive business services[3]	327	52.0%
Health, education, public administration and safety	112	58.0%
Other services[4]	49	69.4%
All sectors	*1,025*	*54.8%*

Notes: [1]Include mining, agriculture, forestry and fishing. [2]Include construction, transport, postal and warehousing, as well as electricity, gas, water and waste services. [3]Include information media/telecommunications, financial/insurance services, professional scientific services, real estate services, and administrative services.[4] Include arts and recreation services and other services.

Table 2 presents the results of the logit model. The size of a firm was positive and significant for Social CRM adoption (b = 0.109, p < 0.01), suggesting that engagement in Social CRM increases with firm size. This result provides support for Hypothesis 1. Industry sector matters for adoption of Social CRM. Firms in the service sectors and in the natural resource sector were more likely to adopt Social CRM than those in the manufacturing sector (b = 1.030 for retail and wholesale services, b = 0.654 for knowledge intensive business services; b = 0.903 for health and education, b = 1.163 for other services, and b = 0.739 for natural resources; p < 0.01). These findings support Hypothesis 2.

Table 2: Logit results for Social CRM adoption

Variable	**Dependent Variable:'Social CRM Adoption'**
Constant	-0.253 (0.364)
Firm size	0.109 (0.039)***
Sector dummies (manufacturing as the reference category):	
Natural resources	0.739 (0.377)***
Infrastructure	0.359 (0.299)
Retail, wholesale, accommodation and food services	1.030 (0.256)***
Knowledge intensive business services	0.654 (0.248)***
Health, education, public administration and safety	0.903 (0.303)***
Other services	1.163 (0.390)***
Market: individual customers	0.469 (0.168)***
Barriers to Social CRM:	
High financial cost	0.224 (0.089)***
Costs outweighing benefits	-0.402 (0.089)***
Time consuming	0.039 (0.076)
Lack of skills	-0.025 (0.087)
Lack of information	0.054 (0.085)
Lack of management support	-0.115 (0.068)*
Security problems	-0.024 (0.116)
Data privacy problems	-0.130 (0.112)
Rigid organisational culture	-0.254 (0.073)***
Technological barriers	-0.021 (0.080)
Employee misuse of social media tools	0.284 (0.071)***
Responsibility dummies (both IT & marketing as the reference category):	
IT management	-0.233 (0.192)
Marketing management	0.172 (0.174)
Number of observations	1,025
Log likelihood	-648.846
LR X^2 (*df*=21)	113.680***
Pseudo R^2	0.081

*Standard errors are in parentheses. *p < 0.1; **p < 0.05; ***p < 0.01*

As expected, the consumer-oriented market was positively associated with Social CRM adoption ($b = 0.469$, $p < 0.01$), providing support for Hypothesis 3. This result suggests that firms that sell to individual customers were more likely to engage in Social CRM than those that sell to other companies or other divisions of their firm. No significant effect of the respondent's main responsibility (IT or marketing) on Social CRM adoption was detected.

Five of the eleven types of barriers were found to have a significant association (either positive or negative) with the adoption of Social CRM by firms. Specifically, there are three types of barriers that had a significant negative effect on Social CRM adoption. These include costs outweighing benefits ($b = -0.402$, $p < 0.01$), lack of management support ($b = -0.115$, $p < 0.1$) and rigid organisational culture ($b = -0.254$, $p < 0.01$). These constrains could be considered as impediments to Social CRM. Interestingly, we found a significant positive association of the two types of barriers – high financial cost ($b = 0.224$, $p < 0.01$) and employee misuse of social media tools ($b = 0.284$, $p < 0.01$) – with Social CRM adoption. These findings provide partial support for Hypothesis 4.

CONCLUSION

This study makes several contributions to research on Social CRM. This paper is one of very few large-scale empirical studies of Social CRM at the firm level. Using a sample of 1,025 Australian firms and employing a logit model, we have found that 54.8% of these firms have adopted Social CRM and the adoption of such strategy is determined by the size of a firm, industry sector, type of market served and the perception of barriers. In specific, the evidence of a positive size effect found in this study suggests that in the absence of the necessary sufficient resources, smaller firms face greater difficulties than larger counterparts in engaging Social CRM. Service sectors are more likely than the manufacturing sector to adopt Social CRM, perhaps because service firms are customer focused and it is easy for them to make the shift to adopting the way consumers communicate. Firms that mainly serve individual customers are more likely to engage in Social CRM than those that sell to other companies or other divisions of their firm.

Making the most of Social CRM engagement, however, requires good effort as they can be the obstacles or constrains associated with such engagement. The perception of costs outweighing benefits, lack of support from senior management and rigid organisational culture (not aligned to the new strategy) are a stumbling block to the uptake of Social CRM by firms. Interestingly, there are two types of barriers that are not a deterrent to engaging in Social CRM: high financial cost and misuse of social media tools by employees. The positive effect of these barriers could be explained through the 'revealed barriers' notion (see D'Este, Iammarino, Savon & Tunzelmann 2012 for extensive discussion about revealed barriers), where adoption of Social CRM increases awareness and perception of the difficulties involved. In this sense, Social CRM adopters are much aware of the challenges in controlling/minimising financial cost and in managing employee misuse of social networking tools; however, they are able to introduce systems, strategies or tactics to cope with them. Indeed, it is likely that there are significant costs in adopting Social CRM, but firms that adopt Social CRM tend to perceive that the returns obtained are greater than costs involved and that they can obtain superior performance from their strategizing efforts.

This study has some limitations which should be borne in mind when interpreting the results. First, our findings are limited by the subjective, self-reported nature of the data. Second, the study's focus on a single developed country may limit the generalizability of the findings to other countries. Finally, the use of cross-sectional data – coupled with the fact that other unknown intervening factors may lead to errors in the analysis – prevents us from inferring causality. These limitations provide avenues for future research.

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Does Information Technology Exist to Server Business Objectives Only? The Significant Role of Modern IT in Reshaping Business Strategy

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ABSTRACT

The traditional view of Information Technology (IT) was that it is a tool to achieve business strategies and objectives. Most research in this regard focused on aligning IT with business strategies. Today, with the impressive advancements of modern IT infrastructure, communications, and connectivity and the role of the Internet and enterprise-wide applications, Information Technology is starting to reshape and affect business strategies in many organizations moving towards an integrated and mutual picture of IT/business effect and changing the way of framing IT as only a functional-level strategy. This paper investigate the role of modern IT in reshaping business strategies, reviews literature about the key dimensions of digital business strategy. The paper also introduces a new research model by extending the Technology Acceptance Model of Davis (1989) with the incorporation of the effect of the key dimensions of digital business strategy.

INTRODUCTION

Most Management Information Systems research, argued that Information technology (IT) has to be aligned with business objectives. The main purpose of IT was to help achieving the business strategies and goals. Much of the extant research on the IT/strategy relationship, however, inaccurately frames IT as only a functional-level strategy. (Drnevich and Croson 2013) Today, IT has become so advanced and impressive improvements in information, communication, and connectivity technologies have unleashed new functionalities. (Bharadwaj et al. 2013)

Information technology matters to business success because it directly affects the mechanisms through which they create and capture value to earn a profit. IT is thus integral to a firm's business-level strategy. (Drnevich and Croson 2013) As information technology becomes integral to the products and services in a growing range of industries, there has been a corresponding surge of interest in understanding how firms can effectively formulate and execute digital business strategies. This fusion of IT within the business environment gives rise to a strategic tension between investing in digital artifacts for long-term value creation and exploiting them for short-term value appropriation. Further, relentless innovation and competitive pressures dictate that firms continually adapt these artifacts to changing market and technological conditions, but sustained profitability requires scalable architectures that can serve a large customer base and stable interfaces that support integration across a diverse ecosystem of complementary offerings.

HOW CAN MODERN INFORMATION TECHNOLOGY (IT) RESHAPE BUSINESS STRATEGY?

During the last decade, impressive improvements in information, communication, and connectivity technologies have unleashed new functionalities. Thus, the post-dotcom decade has seen firms—both established and startups taking advantage of lower price/performance levels of computing (hardware and software) as well as global connectivity through standard protocols (e.g., Internet and mobile web) to adapt their business infrastructure to the new digital era. These digital technologies are fundamentally reshaping traditional business strategy as modular., distributed, cross-functional, and global business processes that enable work to be carried out across boundaries of time, distance, and function (Bharadwaj et al. 2013)

While IT activities remain integral to the functional-level strategies of the firm, they also play several significant roles in business strategy, with substantial performance implications. IT affects industry structure and the set of business-level strategic alternatives and value-creation opportunities that a firm may pursue. Along with complementary organizational changes, IT both enhances the firm's current (ordinary) capabilities and enables new (dynamic) capabilities, including the flexibility to focus on rapidly changing opportunities or to abandon losing initiatives while salvaging substantial asset value. (Drnevich and Croson 2013)

Furthermore, products and services increasingly have embedded digital technologies, and it is becoming increasingly more difficult to disentangle digital products and services from their underlying IT infrastructures (e.g., El Sawy 2003; Orlikowski 2009). Within changing value networks, the profits and competitive advantages of participation reside dynamically at control points that are the positions of greatest value and/or power. The enterprises that hold these positions have a great deal of control over how the network operates, how the benefits are redistributed, and how this influences the execution of a digital business strategy. According to an empirical study in European and U.S. broadcasting industry,

Pagani (2013) illustratesd how incremental innovations may shift value networks from static, vertically integrated networks to more loosely coupled networks, and how cross-boundary industry disruptions may then, in turn, shift those to two-sided markets. Oestreicher and Zalmanson (2013) focused on recent changes in the form of social computing. Although the content industry has implemented social computing to a large extent, it has done so from a techno-centric approach in which social features are viewed as complementary rather than integral to content. This approach does not capitalize on users' social behavior in the website and does not answer the content industry's need to elicit payment from consumers. Both of these objectives can be achieved by acknowledging the fusion between content and community, making the social experience central to the content website's digital business strategy. Data from Last.fm, a site offering both music consumption and online community features. The basic use of Last.fm is free, and premium services are provided for a fixed monthly subscription fee. Although the premium services on Last.fm are aimed primarily at improving the content consumption experience, we find that willingness to pay for premium services is strongly associated with the level of community participation of the user. Drawing from the literature on levels of participation in online communities, we show that consumers' willingness to pay increases as they climb the so-called "ladder of participation" on the website.

The study of digital business strategy needs new concepts and methods to examine how these forces are managed in pursuit of competitive advantage. Woodard (2013) conceptualized the logic of digital business strategy in terms of two constructs: design capital (i.e., the cumulative stock of designs owned or controlled by a firm) and design moves (i.e., the discrete strategic actions that enlarge, reduce, or modify a firm's stock of designs). Woodard (20013) also identifed two salient dimensions of design capital, namely, option value and technical debt. Using embedded case studies of four firms, we develop a rich conceptual model and testable propositions to lay out a design-based logic of digital business strategy. This logic highlights the interplay between design moves and design capital in the context of digital business strategy and contributes to a growing body of insights that link the design of digital artifacts to competitive strategy and firm-level performance. Furthermore, products and services increasingly have embedded digital technologies, and it is becoming increasingly more difficult to disentangle digital products and services from their underlying IT infrastructures (e.g., El Sawy 2003; Orlikowski 2009).

EXTENDING THE TECHNOLOGY ACCEPTANCE MODEL WITH THE DIGITAL BUSINESS STRATEGY DIMENSIONS

Bharadwa et al (2013) identified four key themes to guide our future thinking on digital business strategy and provide a framework to help define the next generation of insights. The four themes are (1) the scope of digital business strategy, (2) the scale of digital business strategy, (3) the speed of digital business strategy, and (4) the sources of business value creation and capture in digital business strategy. The researchers synthesize these four key themes with a discussion of success metrics that could serve as the starting point for developing a rich set of research questions to guide the debate and discussion within the broader academic community and for guiding practicing managers and executives. Bharadwa et al (2013) provided table 1 below which summarizes the description of these key themes of digital business strategy with an eye toward performance by introducing some important questions on each of the four themes to help formulate and execute organizational strategy by leveraging digital resources to create differential value.

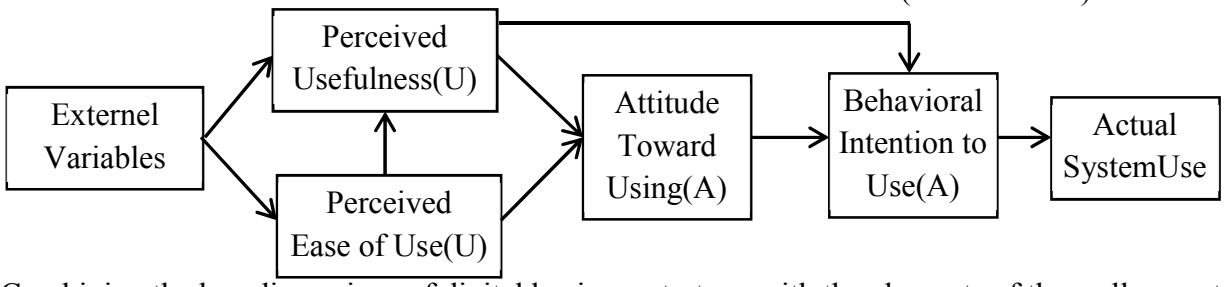
TABLE 1: KEY QUESTIONS ON BUSINESS STRATEGY THEMES

Scope of Digital Business Strategy • What is the extent of fusion and integration between IT strategy and business strategy? • How encompassing is digital business strategy, and how effectively does digital business strategy transcend traditional functional and process silos? • How well does digital business strategy exploit the digitization of products and services, and the information around them? • How well does digital business strategy exploit the extended business ecosystem?
Scale of Digital Business Strategy • How rapidly and cost effectively can the IT infrastructure scale up and down to enable a firm's digital business strategy to bolster a strategic dynamic capability? • How well does digital business strategy leverage network effects and multisided platforms? • How well does digital business strategy take advantage of data, information, and knowledge abundance? • How effective is digital business strategy in scaling volume through alliances and partnerships?
Speed of Digital Business Strategy • How effective is digital business strategy in accelerating new product launches? • How effective is digital business strategy in speeding up learning for improving strategic and operational decision making? • How effectively does digital business strategy bolster the speed of dynamic supply chain orchestration? • How quickly does digital business strategy enable the formation of new business networks that provide complementary capabilities? • How effectively does the digital business strategy speed up the sense and respond cycle?

Sources of Value Creation and Capture
- How effective is digital business strategy in leveraging value from information?
- How effective is digital business strategy in leveraging value from multisided business models?
- How effective is digital business strategy in capturing value through coordinated business models in networks?
- How effective is digital business strategy in appropriating value through the control of the firm's digital architecture?

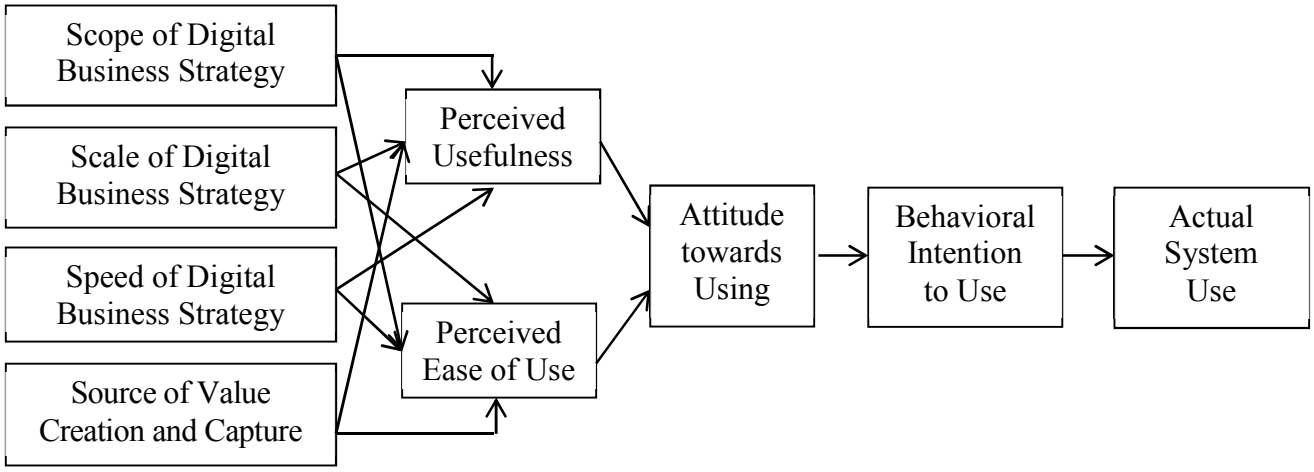
The Technology Acceptance Model (TAM) (Figure 1 below) is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably: Perceived usefulness (PU) - This was defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance". Perceived ease-of-use (PEOU) - Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989). The TAM has been continuously studied and expanded-the two major upgrades being the TAM 2 (Venkatesh & Davis 2000&Venkatesh 2000) and the Unified Theory of Acceptance and Use of Technology (or UTAUT, Venkatesh et al. 2003). A TAM 3 has also been proposed (Venkatesh & Bala 2008).

FIGURE 1: THE TECHNOLOGY ACCEPTANCE MODEL (DAVIS 1989)



Combining the key dimensions of digital business strategy with the elements of the well-accepted Technology Acceptance Model, we have built the following research model (Figure 2).

FIGURE 2: THE TECHNOLOGY ACCEPTANCE MODEL WITH KEY DIMENSSIONS OF DIGITAL BUSINESS STRATEGY



The research model assumes that the four key dimensions of digital business strategy (Bharadwaj et al 2013): Scope of digital business strategy, scale of business digital strategy, speed of digital business strategy and source of value creation and capture will affect the perceived usefulness and perceived ease of use of the technology by the consumer. This by its turn will affect the attitude towards using the technology and the behavioral intention to use, and will result in actual system use. This model assume that the modern and advanced technology including the IT infrastructure, communications, connectivity and the role of the Internet will reshape how we view the role of IT in today's era and go beyond that it is just a tool to achieve business objectives and the traditional view of being functional-level strategy. Modern and advanced technology is becoming a driving force to reshape how organizations do business in what we call digital business strategy.

CONCLUSION

The traditional view of Information Technology of being tool or a functional-level strategy to serve the greater business objectives or strategies is changing. Most researchers in this regard have focused on how to align IT with business objectives to achieve organizational success. But since we have seem impressive advancements in modern IT infrastructure, communications, connectivity and the increased utilization of the web in many businesses, Information Technology (IT) is overcoming this traditional view of being just a tool or a vehicle for success and becoming a direct influencer on reshaping many business strategies. That's why the role of digital business strategy is evolving

strongly in today's business environment. This research paper investigated the significant effect of modern IT advancements and they are starting to reshape business strategies. The paper studied literature in this regard and focused on the key dimensions of digital business strategy. The paper also introduced a new theoretical framework extending the well-known Technology Acceptance Model (Davis 1989) with the key dimension of digital business strategy.

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Conservation And Economic Generation of Indigenous Community in Integrated Tropical Fruits Reforestation

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ABSTRACT

The purpose of this study is attempted to look into conservation and economic generation of integrated tropical fruits reforestation in Malaysia particularly secondary forest granted to the indigenous community which left idle or partially cultivated with self subsistence crops towards fulfillment of at least some of the national economic agendas namely income generation and livelihood of Malaysian indigenous communities and national economy. The introduction and implementation of a designated cost effective methodology or approach of manageable Integrated Tropical Fruits Reforestation Technique and program on the idle or partial attended indigenous customary land will resulted in reaping in profits in upgrading income and livelihood of indigenous people. This not only will reap in the high returns of quality tropical exotic fruits like durian, langsat, cempedak, tampoi, petai, etc, creating orchards within the jungle vicinity as well as tourism. At the same time conservation effort in economically reforestation of the tropical fruits saplings into its natural habitats will reduce the climatic change, environmental conservation as well as create jobs for the local indigenous people. The participative efforts from JHEOA, state government and indigenous community chieftains are crucial and certainly will have great impact in determining the level of achievement in upgrading indigenous community income and livelihood as well as generate country's economy through the expansion of total reforested tropical fruits trees within the jungle land areas, retain and sustain the last frontier of Malaysian treasured environment. Technicality and expertise in the implementation process are two important factors. Knowledge on forest management and tropical fruits agriculture are also taken into consideration in this study. In general, there is a significant difference among factors stated above on reforestation of indigenous community's idle land with tropical fruits trees. The initiatives and eagerness to be successful in this concept depend on the inter-relatedness of the various quarters in the initiatives that will constitute to the income generation and livelihood of indigenous community. The vast secondary jungle land allocated to the indigenous community in Malaysia has much potentiality in consolidation into integrated tropical fruits reforestation not only for the purpose of conservation of Malaysian jungle frontier but also able to upgrade income and livelihood of the indigenous community within the third wave of national economy through agriculture. It was of utmost important for developing the under develop indigenous community and conserve the natural habitat and heritage of the remaining limited Malaysian jungle frontiers into a profitable economic venture.

Keywords: Conservation, Indigenous community, Tropical fruits reforestation, Economic Generation

INTRODUCTION

The Malaysian government has taken various upgrading steps and efforts to improve its agriculture sector, In the 9th Malaysian Economic Plan, the projected growth of agriculture sector is expected and average rate of 6 per cent per annum for the period 2006 – 2010 and 6.5 per cent in 2011- 2020 period, policy formulation as well as implementation process to move the economy up the value chain by increasing the productivity, competitiveness and value added and value creation of the increase in earnings of major commodities, this is to enabled the sector to retain its sustainability. Under the new national economic programs, there has been an increase in 'value-added' agriculture due to changing in consumers' taste and preference (Starks and Bukenya, 2008**)** The value added in agriculture is to economically add value to a product by changing its current place, time and from one set of characteristics to other characteristics that are more preferred in the marketplace" (Boland, 2007). The up-grading of up-stream production as well as the down-stream market enable the Malaysian agriculture fraternities to enjoy the economic booms especially the increase in the price of primary agriculture products and increase in demand of world market.

The large scale commercial estate-plantation and smallholding in agriculture may meet the targeted growth but what about the indigenous community occupying less than 5% of smallholding and indigenous customary land with their self subsistence which left unattended and total dependent to its ecological nature itself and onslaught of the middleman? As King (1995) stated that Malaysia, a state with multiple ethnic, indigenous and religious subgroups and the fragmentation of legal control in relation to traditional knowledge has results in unequal distribution of rights for indigenous people and local communities. They may benefit from the program but not in their earning from their meager plot of small subsistence farm of between 0.5 - 2 hectares. Many of the indigenous community still

live a nomadic life style in the jungle fringe cultivating subsistence crops like tapioca, yam and collecting jungle fruits. Worst is the problem of some of this land even though planted with rubber, oil palm, and tropical fruits like especially durian, cempedak, petai etc which are left unattended. Certain indigenous community after the first season cultivation and when the fertility of soil faded and soil erosions set in, they left for a new piece of land in the jungle. In order to revive it through the new concepts of integrated tropical fruits reforestation program which is profitable and add values to the indigenous community, then land consolidation and rehabilitation work has to be done first. Therefore the feasibility in the introduction of the Indigenous Community in Integrated Tropical Fruits Reforestation program will certainly reap in economic generation to a satisfactory level and to conserve the depletion of eco-system, retain the existing flora and fauna and improve indigenous community income and livelihood as well as getting them into the mainstream national economic development.

■Research Objective

The objectives of this research are to examine and propose to the Department of Indigenous Community Welfare (JHEOS) in Malaysia ways on solving the indigenous communities' plight of not be able to follow the mainstream of the country's economic development, community improvement and sustainability of eco-system with the integrated tropical fruits reforestation on indigenous customary land which are left idle and fall prey to nature and soil erosion.

The introduction of a integrated tropical fruit reforestation strategy on the consolidated and rehabilitated indigenous customary land not only could generate income and livelihood of indigenous community to a satisfactory level for their effort in cultivating tropical fruit trees in its natural habitat among the path cleared in between the secondary forest on their 0.5 – 2 hectare plot of land. The enhancing of integrated tropical fruit tree in the secondary jungle could nurture the soil nutrients and contribute to environmental friendly tropical fruit products for local consumption and export.

LITERATURE REVIEW

As Endicott (2003) point out, the true indigenous in Malaysia are the politically marginalized ethnic groups the *Orang Asli,* and their neighbors the Sabah and Sarawak natives, who have inhibited the area prior to the arrival of the ethnically diverse 'Malays'. These are the group of communities that we are taking into consideration in this paper. The livelihood of Malaysian indigenous community is very low and subsistence in nature and some time they have to depend on the jungle for their meagre three meals and survival by collecting the existing tropical fruits such as petai, durian, cempedak, tampoi, and certain exotic fruits which have high commercial value but its production also dwindle through years, occasionally, they also collect wild jungle honey, bamboos and rattan if there is any demand. Their own plot of land were used to cultivate tapioca, pineapple etc and vast area were infertile and just left idle due to soil erosion.

Bucknell and Pearson (2006) have conducted a survey on rural society and land use and the finding is Agricultural consolidation and intensification has not translated into economic sustainability where on-farm income declined from 1991 to 2000, perhaps due to the niche markets created. Therefore if the Malaysian indigenous communities customary land could consolidate, rehabilitate and intensify in the transformation of tropical fruits reforestation, This increase agriculture and reforestation activities could be designated for innovation clusters, thus providing a foundation of resources for not only sustainability in indigenous communities' economic generation and ecology of the Malaysian nature and jungle.

The replanting of various tropical fruits in the process of reforestation and food crops on the indigenous communities customary land will be returning the tropical fruits tree to its natural habitat that not only could yield satisfactory fruits for local consumption but also for export as well as upgrading the indigenous community's livelihood rather than the customary land just left idle and face erosion. Wiersum (1997) stated that there are three major categories of forest management practices that could be identified, namely controlled utilization of forest product; protection and maintenance of forest stands, and purposeful regeneration. Based from the principles, model could be developed for exploitation of agriculture crops, and various stages of forest management are distinguished along a gradient of increasing input of human energy per units of exploited forest and the gradient represents a continuum of forest-people interactions, this also illustrate how a various manifestations of indigenous forest management may be arranged along a nature-culture continuum.

Reforestation of indigenous customary land into value added commercial venture and sustainability of its ecology and environment not only could transform modern farming and its sustainability for the livelihood of indignations community that depend much on the environment. Vernooy and Song (2004) stated that new approaches to agricultural development are needed to conserve agricultural diversity, improve crops, and produce food of quality for all. Such an approach should enable small farmers on marginal lands to participate as equal partners.

Thornton et al (2006) stated that it is seeking to redefine the roles of scientists and farmers through collaborative learning processes, addressing questions about the level, timing, type and form of participation, as well as the most effective approaches and methods to foster them. The research domains of the program deal with sustainable intensification of indigenous smallholders agriculture, the sustainable management of natural resources, the development of efficient markets, and the promotion of enabling policies

Stoop and Hart (2006) suggested that sustainable agricultural development is presented as a diverse and dynamic process through which it copes with agro-ecological and socio-economic diversity at field level and with ever-changing needs and opportunities of the indigenous communities.

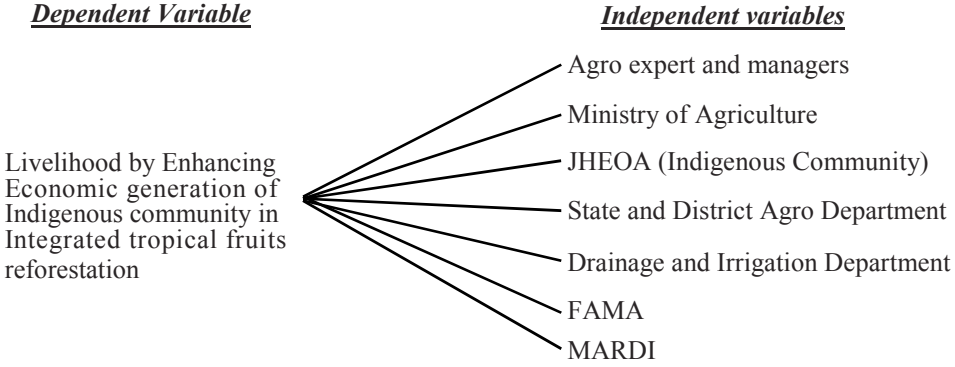
Even Kaljonen and Rikkonen (2005) had pointed out that the latest reforms of agriculture practice in Europe that has adopted a concept of multifunctional agriculture that should encourage farming to play several roles in society and contribute to the well-being of rural areas by managing the countryside and the environment. This concept and agriculture reform best suit the managing of indigenous communities' customary land into an integrated tropical fruits reforestation in Malaysia. .

Mele and Chien (2004) quoted a more diverse, perennial cropping systems often have better natural mechanisms for keeping pests at bay. But while scientists emphasize the broad benefits of conservation in terms of effective ecosystem functioning, farmers are more interested in biodiversity for the provision of food or of services such as shade or windbreaks. Because of their limited knowledge of the role of biodiversity in plant protection, farmers sometimes unconsciously disturb natural regulatory mechanisms. Fruits trees grow well in its natural habitat and require little care. Therefore the indigenous communities could be able to sustain their livelihood and helps the country in the conservation process of their customary land.

Friday et al (2006) has surveyed a participatory rural appraisal project as part of an agricultural development project that provided the basis for a number of community-based participatory extension initiatives. Despite the poverty of many of the communities involved, and in contrast to published literature on the local agricultural situation, farmers clearly expressed their need for more marketable crops and alternative sources of livelihoods.

Figure 1: Theoretical Framework

Theoretical framework



METHODOLOGY

Investigative and interview technique through the chieftain (Tok Batin) as medium were applied. Since the total selected respondents are illiterate, the investigative and interview session has been conducted to gather the answers of the opinion on the self subsistence and indigenous customary land of the indigenous community. Interview session also convenes on the management of their plot of land for the feasibility of conducting of the concept of integrated tropical fruit reforestation program proposed.

Likert 5 point scale (5- Strongly Agree, 4- Agree, 3- Undecided, 2- Disagree and 1- Strongly Disagree) were use in the process of gathering data pertaining the indigenous communities' opinion on their farm dimension, livelihood dimension and the propose integrated tropical fruits reforestation conception.

The details of plot of land, and management of their land uses from the respondents were also studied from secondary data. This is to determine the feasibility of the propose integrated tropical fruits reforestation in improving the indigenous community's income and livelihood, economic generation, sustainability of eco-system, reduce the climatic change, environmental conservation as well as create jobs for the local indigenous people by enhancing the proposed integrated tropical fruits reforestation concept.

DISCUSSION OF FINDINGS

Reliability of instruments Cronbach Alpha statistic is found to be 0.733; therefore the reliability of the questionnaire is acceptable.

■ **Descriptive Statistics**

Table 1: Summary of Respondents' Characteristics

	FREQUENCY	PERCENTAGE (%)
1. Gender		
Male	55	58
Female	40	42
2. Age		
21 -30	15	16
31 -40	17	18
41 -50	20	21
> 50	43	45
3. Experience in Agriculture		
0 – 5 years	03	03
6-10 years	42	44
>11 years	50	53
4. Land own		
0-0.5 hectare	60	63
1-2 hectare	32	34
>3 hectare	03	03
5. Monthly income		
150 -300	65	68
301 -600	18	19
601 -900	10	11
901 -1200	02	02

Table 1.1 summarizes the respondents' characteristics. They are 55 male (58%) and 40 female (42%), indigenous people from two separate indigenous communities who still practice the traditional way of life and nomadic farming on their small plot of customary land in this district. Table 1.2 shows the respondents' age composition, 43 of them were aged 50 and above. Table 1.3 shows that 3 respondent have between 0-5 years experience in agriculture (3%), 42 respondents have between 6-10 years experience (44%) and 50 respondents have more than 11 years experience (53%) in subsistence agriculture. Table 1.4 shows that 60 respondents have poses land not more than 0.5 hectares (63%), 32 respondents (34%) poses between 1 - 2 hectare of agriculture land and only 3 respondents poses more than 3 hectare of agriculture land (3 %).

Frequency table of indigenous people interview pertaining to the improving of income and livelihood by enhancing the propose integrated tropical fruits reforestation concept of eco-system sustainability shows that almost all the respondents strongly agreed to the propose setting up of a work teams in between government agencies and the indigenous communities in improving the indigenous communities' income and livelihood by enhancing integrated tropical fruits reforestation program.

Table 2: Indigenous Community's Opinion on Customary Land Dimension

Customary Land Dimension	N	Frequency	Mean
		SA A U D SD	
1. Age slow down the tending of land	95	75 20	3.9
2. Able to tend to the land themselves	95	5 10 15 65	0.26
3. Land located far from community	95	84 10 1	4.4
4. Income derive from land not enough to cater the livelihood	95	93 2	4.9
5. Not be able to replant again	95	85 10	4.8
6. Soil erosion not taken care properly	95	70 25	3.7
7. Not be able to sustain	95	86 9	4.5
8. Undergrowth not clear	95	94 1	4.9
9. Not applying of agro fertilizer	95	92 3	4.8
10. Low yielding farm produce	95	80 10 5	4.2
11.Younger generations are not interested to toil the land	95	80 10 1 4	4.2
12. Constant attack by farm pests	95	87 8	4.6
13. Able to develop the land	95	1 2 5 87	0.05

Table 3: Indigenous Community's Opinion on the Marketing of Products Dimension

Land Tending Dimension	N	Frequency	Mean
		SA A U D SD	
1. Difficult to sell the farm produces	95	62 25 8	3.3
2.All extra produces sold to middleman	95	70 12 10 3	3.7
3. Agriculture produces fetch low price	95	90 2 1 2	4.7
4. No help come from government agencies	95	60 20 5 5 5	3.2
5. Most of the edible farm produce were consume in personally	95	71 6 2 5 6	3.7
6. Most of the produces destroyed by pests	95	55 21 5 5 9	3.7
7. Need to gather jungle products to supplement family needs	95	75 10 2 8	3.9

Table 4: Indigenous Community's Opinion on The Propose Integrated Tropical Fruits Reforestation concept

Integrated Tropical Fruits Reforestation	N	Frequency	Mean
		SA A U D SD	
1. Able to generate double the income from customary land.	95	90 3 1 1	4.7
2. Proper management of customary land	95	90 2 1 1 1	4.7
3. Owners are able to involve in the management of their plot of land	95	80 5 2 4 4	4.2
4. Able to share profit and income distribution with governmental agencies	95	85 6 1 3	4.5
5. Joining as member of cooperative.	95	81 10 1 2 1	4.3
6. Owners maintain their plot of and.	95	95	5

The indigenous communities' plight that lack of knowledge, education, and government agencies' help and their own attitude has hinder their progress and livelihood. They have to depend on the traditional subsistence planting attitude even the government has provide land for cultivation. The stagnated growth of indigenous community agriculture initiative could be rectify easily by gather cooperation from government agencies like FAMA, MARDI, state and district agriculture department, drainage and irrigation department, and the village chieftains or local representative in the state government. Doessel and Vakadkhani (1998) quoted that income inequality can be reduced by stimulating the good producing sectors of the economy such as agriculture and the indigenous communities' customary plots of land could be consolidated and rehabilitated and put into proper and prosperous use for the integrated tropical fruits reforestation in the forest management program.

The statistical Table 2 above on the indigenous people's customary land dimension can be sums up as even though the total area is quite large but due to the lack of fund, technological know-how, and the indigenous people's attitude and culture, many are left idle which were cover by secondary jungle with thick undergrowth and a few fruit trees. Occasionally, we can see the clearing of certain patches of land for the cultivation of temporary crops like tapioca and yam. If the indigenous land can be consolidate and rehabilitate through propose integrated tropical fruits reforestation program. It will reap in high quality agriculture produces, exotic jungle product and generate economy for the indigenous communities and country as well as conservation of eco-system and reducing climatic warming.

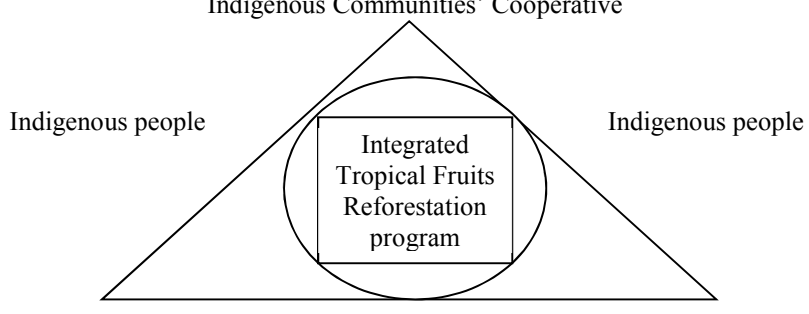
The consolidation and rehabilitation of indigenous customary land in forest management will complying to the rules and regulation stipulated in the national land code with strict regulation on the plot of customary land grant to the indigenous community members that stipulated in the land title on land uses, prohibition for sale and mortgage as well as the prevention of soil erosion.

Most of the indigenous community land were left idle even there are still planted with orchard like durian, langsat, bidara, cempedak, jering, tampoi, petai and various exotic jungle fruits or uneven rubber trees and oil palm intertwined with secondary jungle and thick undergrowth. The propose integrated tropical fruits reforestation are feasible to revitalize and regenerate the indigenous customary land into economically sound eco-system friendly conservation project and generate economy to upgrade the livelihood of indigenous communities and the country. The profit derive from the project would be able not only upgrading their livelihood but also re-greening the country and protect the eco-system that will reduce the climatic change, environmental conservation as well as create jobs for the local indigenous people who are suffering from unable to join the mainstream of economic growth.

The statistical Table 3 above shows that the indigenous communities really need help from all quarters, private or public to revitalize their idle customary land to generate economy. Would it be on sharing basis or governmental subsidized project, otherwise it will left to the mercy and onslaught of the unscrupulous middleman. The blunders will further worsen the situation and livelihood of the indigenous community.

Statistical Table 4 above shows that the indigenous communities need certain forms of assistance from the authorities. The introduction and implementation of the Integrated Tropical Fruits Reforestation program not only could sustain the existing eco-system with its flora and faunas, further with the addition of various tropical fruits trees back to its natural habitat will boost its reforestation scheme, produce high quality and high demanded tropical fruits for local consumption and foreign market as well as increase the consciousness in environmental conservation.

Figure 2: The Integrated Tropical Fruits Reforestation Concept



Ministry of Agriculture + JHEOA (FAMA, MARDI, District Agriculture Dept, State and District Forestry Dept, DID etc)	Ministry of Primary Industry FRIM

The formula of profit sharing is shown below:-

$$\textit{Integrated Tropical Fruit Reforestation} = \sum_{i=1} I+F+A+C+T+B - \textit{Cost}..... (1)$$

Where Integrated Tropical Fruit Reforestation concept and implementation on the indigenous communities are the combine effort of government agencies which include indigenous people (*I),* FAMA (*F*), Agro department (*A*), Indigenous Community cooperative (C), local private tourist agencies (*T*), FRIM (*B)*

The cost of implementing the integrated tropical fruits reforestation concept is minimal, it consist of the indigenous community customary land, tropical fruits tree sapping clearing of the undergrowth, tree sapping from FRIM and subsidies provided by the various government agencies. The total earning from the initiatives could be handling through the JHEOA and the indigenous community cooperative. The other cost will be absorbed by the government agencies respectively.

Therefore the exact earning of the above concept will be five fold, it not only could upgrade the indigenous communities' livelihood but also able to profit various sectors and indirectly conserve eco-system, reduce global warming and generate economy for the indigenous communities and country.

The indigenous community will enjoy larger amount of profit and earning if they are willing to put forth other initiative and effort in venturing into other miscellaneous business such as bee breeding, fungus planting as well as sandal wood planting. Besides, the creativities and innovativeness of the indigenous community could spur further their earning by introducing local specialties like dishes, handy crafts etc. All this ventures are very lucrative and enable them to earn many folds of profits

The indigenous people still getting on with their daily routine of harvesting their effort and maintain their holding of the customary land. The differences are the results from the new economic concept; they may reap in the extra income to further upgrade their livelihood.

CONCLUSION AND RECOMMENDATIONS

The anticipation of integrated tropical fruits reforestation concept on the indigenous community customary land through consolidation and rehabilitation is in fact very feasible to their expectation in term of profit earning which could increase their income and livelihood rather than just let the valuable land idle and face soil erosion.

It has been tested and the result is beyond the mere expectation of everyone involved. Even if the concept applied not round the year basis but seasonal in nature tropical fruits season of durian, langsat, rambutan, bidara dan cempedak and other exotic fruits lasted only a month in a year. The secondary jungle could also reap in the valuable tropical hard word for wood based industries..

With the introduction and implementation of the formidable integrated tropical fruits reforestation concept on the indigenous communities' customary land, each village's chieftains will have to play their part in helping their society prosper the village. Through this means, it not only the government does not have to subsidize heavily on them but the indigenous people could upgrade their livelihood and generate the country's economy.

The government through the Ministry of agriculture and the affiliating agencies should draft out a monthly Calendar of planning to initiate the smooth process of integrated tropical fruits reforestation in each indigenous village throughout the country.

The young generation of the indigenous society must be trained to upkeep, clear the undergrowth and fertilize their customary land to facilitate the success of the integrated tropical fruits reforestation. Everything must be at bay for the successful of the said program implementations.

Indigenous society village chieftains should review the projects occasionally with the district office and governmental authorities to foresee prospect of the integrated tropical fruits reforestation for the country's future.

All in all, to conclude, as Ferrari observe and noted that since the 1980s, and the past decade, indigenous peoples and local communities have been taking active initiatives in conserving and sustainable managing biodiversity, sometimes on their own but often with the support of NGOs or as join management with government departments, despite the lack of supporting legal instruments. There is a recent increasing trend in community conservation initiatives and in community involvement in conservation initiatives initiated by NGOs or government agencies which is in-line with the Ninth Malaysian Economic Plan for agriculture sector which emphasized on *New Agriculture,* participation in high quality and value-adding activities. Such as undertaken to expand the use of better clones, seedlings or breed, adopt new technology and knowledge-based agriculture, gazette the necessary and for agricultural zoning, land consolidation as well as promote better coordination in project planning and implementation, extension services, quality control, financing and marketing. With the inclination of according to Phillips (2003), the shift from a 'fortress conservation' framework

to a community-oriented protected areas approach has emerged alongside international trends seeking to combine conservation and community development – the notion of community-based conservation.

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Rough Set Theory on Corporate Financial Crisis Prediction

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ABSTRACT

This paper proposes rough set theory approach to predict corporate financial crisis. The aim of this paper is to verify the relationship between the failure-signs of small and medium enterprises and the unlisted company. In conclusion, this paper disclosed the relevant subsets of prediction characteristics and represented the important relationships between crisis warnings for small and medium enterprises and the failure of public traded company. The rough set theory analyses the hidden relationship in the signs of failure we input in and recommends effectiveness prediction rules to corporate management, investors, creditors, financial institutions and even the government.
Keyword: rough set theory, financial ratios, financial crisis, hidden relationship, prediction rules

INTRODUCTION

Due to the improvement of the information technology, the structures and transactions of the enterprises become more and more complicated. With increasingly complex organizational size, once the companies' financial crisis occur the scope and the level of involvement it impacts on may be very large not only the enterprises themselves but also many related parties including the downstream manufacturers, financial institutions, investors and creditors. When an enterprise is in financial difficulties, a general warning and predictable signs will appear. As the outbreak of the financial crisis is a result of a gradual process for months or even for years, timely prediction of financial crisis is useful for all parties involved, such as investors, managements, employees, creditors, suppliers, clients, the community and the government to take action to prevent failure. These actions include corporate restructurings, selecting which firms to invest in, and helping the pricing of loans.

According to the past related studies, most of the research variables used in the studies of the financial crisis prediction are financial ratios which are selected by the scholars. It is rare to do the related research by using the failure signs observed from the practice. However, we think that the characteristics observed from the failed companies may be the key factors to predict the financial crisis. Scholar Liu Huo sheng has studied and analyzed corporate financial crisis for a long time. He found that the phenomenons of failure companies are quite similar and summarized the reasons of the financial crisis as follows: expansion too fast, high-expansion financial leverage, intersect holdings, speculation in stock, excessive debt, etc. Therefore, in this paper, we tries to use the failure signs of small and medium enterprises proposed by scholar Liu Huo sheng,(Liu Huo-sheng. 2012) to verify that whether these variables can predict the financial crisis precisely. Through this research, we also try to verify that the corporate failure signs are very similar no matter how large the scale of it.

A large number of methods like discriminant analysis, logit analysis, recursive partitioning algorithm, etc., have been used in the past for the early warning of financial crisis. Most have focused on the financial information of the financial statements for explanatory variables (Altman 1968; Collins and Green 1982; Collins, Ghosh et al. 1988; Altman, Haldeman e t al. 1977). Although some of these methods lead to models with a satisfactory ability to discriminate between healthy and bankrupt firms, they suffer from some limitations, often due to the unrealistic assumption of statistical hypotheses or due to a confusing language of communication with the decision makers. These methods require expert advice to select the attribute field, and researchers need specialized knowledge of statistics, hence, the results of research and analysis will not produce straightforward decision rules. Though the neural network method was used in the past empirical studies for the training dataset with moderately good predictions, the neural network approach may be ill-fit for the situation. Thus, the prediction results of the test dataset will be relatively poor, and ultimately the results cannot produce a clear and understandable forecast as decision rules for managers to follow.

Rough set theory can find out the fact among the data without any other related information or assumption and produce straightforward decision rules through the elimination of redundant or useless information of the datasets. Compared with other methods, the decision rules produced by rough set theory is easy to understand. User need not to interpret the parameters of the final model and therefore it is suitable to analyze the strategies and provide the solutions for the problems entrepreneurs face. (Lai Jiarui, Wenkun Li, 2005) Due to these advantages, this study applies rough set theory on the failure signs previously mentioned to filter the attributes, reduce the dimensions of the data, and reduce the complexity of the calculations, and then use the prediction rules it generate to conduct the

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training and testing prediction. This paper predicts five years in advance to explore which annual report is the best to be used for the prediction model to take the timely effective measure.

The rest of this paper is organized as follows: Section 2 briefly introduces the literature related to rough set theory, financial crisis, and financial ratios and non-financial variables. Section 3 proposes and introduces the research framework and algorithms used for analysis. Finally, in Section 4, findings and conclusions are presented.

RELATED WORKS

This section briefly reviews the literatures related to rough set theory, financial crisis, and financial ratios and non-financial variables.

■Rough set theory

Rough set theory was developed by Pawlak (Z. Pawlak and A. Skoworn, 2007) and has been described as an effective mathematical tool for modeling vagueness and uncertainty. This approach is particularly important in artificial intelligence research and cognitive sciences, especially in the fields of machine learning, knowledge discovery from databases, data mining, support systems, inductive reasoning and pattern recognition (P. Kumar, P.R. Krishna, R.S. Bapi and S.K. De 2007, D. Parmar, T. Wu and J. Blackhurst2007, Z. Pawlak 1997). One advantage of Rough set theory is that it requires no preliminary or additional information about data such as probability distributions in statistics, basic probability assignment in the Dempster-Shafer theory of evidence or membership grade of the value of possibility in fuzzy set theory (Z. Pawlak and A. Skoworn 2007) Recently, RST has been applied in such varied fields as medical diagnosis, drug research, process control, credit fraud detection, bankruptcy prediction, stock market rule-generation, market research, climate change and the development of expert systems for The NASA Space Center (J. Grzymala-Busse 1992).

Rough set philosophy is founded on the assumption that, in the universe of discourse associated with every object, some information objects characterized by the same information are indiscernible because of insufficient information. Any set of all indiscernible objects is called an elementary set and forms a basis granule of knowledge about the universe. Any union of elementary sets is referred to as a precise set; otherwise, the set is considered rough. As noted by Pawlak and Skoworn, rough set theory incorporates the use of indiscernibility (equivalence) relations to approximate sets of objects by lower and upper approximations (Z. Pawlak and A. Skoworn 2007). Figure 1 shows the basic notions of rough set theory (B. Xu, Y. Zhou and H. Lu2005). The lower approximation consists of all objects that surely belong to concept X, and the upper approximation contains all objects that possibly belong to concept X. The difference between the upper and lower approximation constitutes the boundary region of concept X.

Rough set method is a series of logical reasoning procedures for analyzing an information system. Table 1 shows an information system in the form of a decision table with a set of objects U (o_1,…o_5) contained in the rows of the table. The columns denote condition attributes C (driver's age, vehicle type and climate) of these objects and related decisions attribute D (accident type).

Figure1: Basic Notion of Rough Set theory

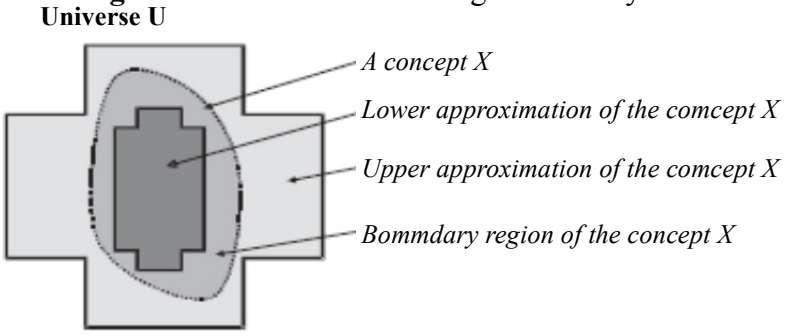


Table1: Example of Accident Cases with Describing Features

Objects	Driver's age	Vehicle type	Climate	Accident type
o_1	young	motorcycle	sunny	off-road
o_2	old	automobile	sunny	off-road
o_3	young	motorcycle	sunny	rollover
o_4	middle-aged	motorcycle	sunny	rollover
o_5	middle-aged	automobile	rainy	rollover

For the condition attributes in Table 1, all objects can be formed into four elementary sets—{1,3}, {2}, {4} and {5}. This means that objects 1 and 3 are indiscernible while the other objects are characterized uniquely with all available information. Therefore, the off-road accident type is described with the lower approximation set {2} and the upper approximation set {1,2,3}.

Similarly, the concept of the rollover-accident type is characterized by its lower approximation set {4,5} and upper approximation set {1,3,4,5} (J.T. Wong and Y.S. Chung 2007).

■ **Financial crisis**

Corporate financial crisis has been an important topic of financial academic research which is a major factor affecting national economic performance. When an enterprise is in financial difficulties, a general warning and predictable signs will appear. This paper is based on the signs that proposed by the scholar Liu Huo sheng in the third edition of Financial Accounting Practice SME Finance Academy in Taiwan (2012). Scholar Liu Huo sheng has dedicated to the field of corporate finance for a long time. After years of observation and actual participation in the company's financial diagnostic counseling, Liu Huo sheng summarized the signs of corporate financial crisis and divided them into two types as shown in Table 2.

■ **Financial ratios and non-financial variable**

Analysis of financial statements is useful to evaluate corporate management performance, predict future operating results and financial position to help investors or business owners to make a favorable decision. Table 3 is the financial variable dataset attributes that use to translate the non-quantitative indicators, the failure-signs of small and medium enterprises into the quantitative indicators. The attributes a1 to a35 are financial ratios or accounts that translate the signs showed in the financial statement of Table 2 to be measurable. There are also four signs not showed in the financial statement of Table 2 are selected to be the variables which can be easily obtained and quantified, including the replacement of the CPA, the opinion type received from the CPA, and the amount of transactions with related parties.

Table 2: The Failure-signs of Small and Medium Enterprises

Signs showed on the financial statement	Signs not showed on the financial statement
1. A serious shortage of liquidity, supporting long term investment with short term debt, weak solvency, or poor financial structure.. 2. Fixed ratio is greater than 1. 3. Part of products or business units occurs substantial losses or weak profitability. 4. Debt ratio is greater than 2 or the proportion of own funds is low. 5. Inventory is greater than net assets. 6. Net assets is less than the par value of the shares. 7. Sum of accounts receivable and inventory is greater than an half of the year revenue. 8. Accounts receivable turnover becomes less and less. 9. Inventory turnover becomes less and less. 10. The amount of unearned revenue, prepayment, temporary payment, or temporary receipts increases abnormally. 11. Warranty and contingent liability increase abnormally. 12. Products have no contribution margin 13. The amount of operating cash flow is continuously huge. 14. Operating income does not increase but the accounts receivable and inventory highly increase. 15. Operating income is less than liability. 16. Net income is primarily from non-operating income. 17. Long term investment is greater than capital and the investee company rarely pays dividends.	1. Low utilization of machinery and equipment or plant and equipment over expansion. 2. The product yield rate is relatively low or the company has not passed the test of products continuously for more than two years. 3. Company borrows money with underground native bank. 4. The reason for applying the loan is different with the company announce for the usage of the loan. 5. The company discounts the third-party notes with the bank and often replaces the notes for the extension of the term. 6. Company often deposits money at the last minute before the deadline of the notes. 7. Company delays payment or changes the payment method. 8. Company suddenly changes the primary dealing bank. 9. Banks call the loan suddenly. 10.Company deals with a huge amount of banks 11.Company replaces the CPA. 12.CPA issues qualified or disclaimer opinion 13.Company has high value of abnormal transactions with related parties 12.CPA issue qualified or disclaimer opinion 13.Company occurs high value of abnormal transactions with related parties 14.Unsoundly accounting policy 15.Lack of cash budgeting and financial capacity.

Table 3: Financial Variable Dataset Attributes

Attributes		Explanations
a1	Current Ratio	Current Asset / Current Liability
a2	Quick Ratio	(Current Asset – Inventory) / Current Liability
a3	Long-term Solvency	Net income / Interest Expense
a4	Current Liability	Supporting the acquisition of long-term investment or fixed assets with current liability
a5	Long-term Investment	
a6	Fixed Assets	
a7	Debt Ratio	Total liability / Total Asset
a8	Long-term Fund to Fixed Assets Ratio	(Net Shareholders' Equity +Long-term Liability) / Net Fixed Asset
a9	Interest Coverage	Earnings Before Interest and Tax / Interest Expense
a10	Fixed rate	Fixed Asset / Shareholders' Equity
a11	Operating Income	The amount of loss of products or business units
a12	Net Income	
a13	Total Assets	
a14	Return on Assets	【Net Income + Interest Expense × (1-Tax Rate)】 ÷Average Total Asset
a15	Return on Equity	Net Income ÷ Average Shareholders' Equity
a16	Profit Margin	Net Income ÷Net Sales

a17	Earnings Per Share	（Net Income - Preferred Stock Dividends） ÷ Weighted Average Number of Shares Issued
a18	Equity Fund	（Equity Fund ÷Total Asset）×100%
a19	Inventory>Net Assets	Inventory>Net Assets
a20	Net Assets＜Par Value of Shares	Net Assets＜Par Value of Shares
a21	The amount of accounts receivable and inventories to total operating income	（Accounts Receivable +Inventory）＞ （Operating Inome×0.5）
a22	Accounts receivable turnover ratio	Net Sales ÷Average Accounts Receivables
a23	Inventory turnover ratio	Cost of Good Sales ÷Average Inventory
a24	The amount of unearned revenue, prepayment, temporary payment, or temporary receipts	Use all the amount in the data set to calculate the Mean and the Interval
a25	The amount of warranty and contingent liability	Use all the amount in the data set to calculate the Mean and the Interval
a26	Products have no contribution margin	（Selling Price－Variable Costs）≦0
a27	Operating Cash Flow	Use all the amount in the data set to calculate the Mean and the Interval
a28	Sales Revenue	（Current Sales Revenue－Prior Period Sales Revenue）＜ 【（Current Accounts Receivable + Current Notes Receivable +Current Inventory）－（Prior Period Accounts receivable+ Prior Period Notes receivable +Prior Period Inventory）】
a29	Accounts Receivable and Notes Receivable	
a30	Inventory	
a31	Sales＜Total Liabilities	Sales＜Total Liabilities
a32	Net income primarily from non-operating income	Non-operating Income ÷Net Income
a33	Long-term Investment	Long-term Investment＞Common Stock Capital + Preferred Stock Capital
a34	Common Stock Capital	
a35	Preferred Stock Capital	
b1	Replace the CPA frequently	Replace the CPA frequently
b2	Independent Audit Report	Opinion issued by the CPA
b3	Sales with related parties	Sales with related parties / Total Sales
b4	Purchase with related parties	Purchase with related parties / Total Purchase
d	Decision variable	0: listed company、 1: unlisted company

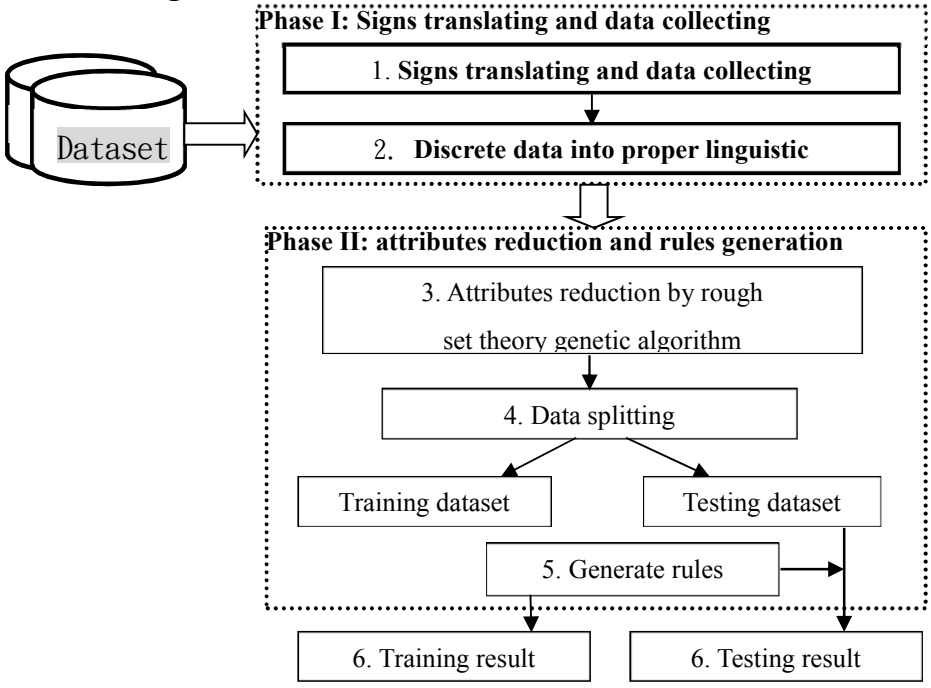
THE PROPOSED RESEARCH FRAMEWORK AND ALGORITHM

This section briefly introduces the conceptual basis and framework of the proposed model, and the steps of the algorithm.

■Proposed model

The model of this paper can be roughly divided in two phases: (1) Generate the attributes from translating the signs that proposed by the scholar Liu Huo sheng and collecting the data (2) Apply the rough set theory to extract classification rules and obtain the result. (Figure 2) This paper translates 20 signs, proposed by the scholar Liu Huo sheng, into attributes a1~a35 and b1~b4. After then, this study applied the rough set theory on the financial variable dataset attributes, using the corresponding linguistic data to extract classification rules. This paper uses financial ratio and non-financial variable as the empirical research datasets, data collection period from 2002 to 2012.

Figure 2: Proposed Financial Crisis Prediction Model



■The proposed algorithm

To understand the proposed model easily, this section uses the fifth year before unlisted practical financial variable dataset as empirical dataset, to demonstrate the steps of the proposed model as follows:

■Step1. Signs translating and data collecting

This paper uses all the 17 signs that will show on the financial statement and translates them into attributes a1~a35. Also, this paper selects 3 signs that will not show on the financial statement which are reasonably available from the public information and translates them into attributes b1~b4. The detailed is as Table 4. This paper collects the data of 22 listed companies and 22 unlisted companies from the Market Observation Post System and TEJ (Taiwan Economic Journal) database. In this step, we also remove noise, missing value, error and correct inconsistencies in the data.

Table 4: The Failure-signs of Small and Medium Enterprises and Related Attributes

No.	Failure-signs		Related Attributes
1	A serious shortage of liquidity, supporting long term investment with short term debt, weak solvency, or poor financial structure.	A serious shortage of liquidity or weak solvency	a1, a2, a3
		Supporting long term investment with short term debt	a4, a5, a6
		Poor financial structure	a1,a2, a7, a8, a9
2	Fixed ratio is greater than 1.		a10
3	Part of products or business units occur substantial losses or weak profitability.	Part of products or business units occur substantial losses.	a11,a12, a13
		Weak profitability	a14, a15, a16, a17
4	Debt ratio is greater than 2 or the proportion of own funds is low.	Debt ratio is greater than 2.	a7
		The proportion of own funds is low.	a18
5	Inventory is greater than net assets.		a19
6	Net asset is less than the par value of the shares.		a20
7	Sum of accounts receivable and inventory is greater than an half of the year revenue		a21
8	Accounts receivable turnover becomes less and less.		a22
9	Inventory turnover becomes less and less.		a23
10	The amount of unearned revenue, prepayment, temporary payment, or temporary receipts increases abnormally.		a24
11	Warranty and contingent liability increase abnormally.		a25
12	Products have no contribution margin.		a26
13	The amount of operating cash flow is continuously huge.		a27
14	Operating income does not increase but the accounts receivable and inventory highly increase.		a28, a29, a30
15	Operating income is less than liability.		a31
16	Net income is primarily from non-operating income.		a32
17	Long term investment is greater than capital and the investee company rarely pays dividends.		a33, a34, a35
18	Company replaces the CPA.		b1
19	CPA issues qualified or disclaimer opinion.		b2
20	Company has high value of abnormal transactions with related parties.		b3, b4

■Step2. Discrete data into proper linguistic

The financial variable dataset variables are mostly continuous attributes, and continuous attributes cannot be applied directly to rough set theory. Therefore, this paper divided the data collected into three levels by their value to discrete the continuous attribute data into proper linguistics (1, 2 and 3 which means good, normal and bad respectively). For example, qualified opinion issued by the CPA is a characteristic for the companies which are more likely to be unlisted, so qualified opinion is symbolized by 3 and modified unqualified opinion and qualified opinion are symbolized by 2 and 1 respectively. Table 5 is the original data source before discredited and Table 6 details the data after discredited process.

Table 5: Original Data Source Before Discretized

a1	a2	a3	……	b3	b4	d
144.74	71.99	8.279871		0.6	0.11	1
146.03	85.91	11.29518		0.7	0.16	1
145.87	90.79	25.81532	……	0.65	0.12	1
149.47	97.17	28.06768		0.66	0.1	1
149.07	98.24	10.13474		0.6	0.1	1

Table 6: Original Data Source After Discretized

a1	a2	a3	……	b3	b4	d
3	3	2		3	2	1
3	3	2		3	2	1
3	3	2	……	3	2	1
2	3	2		3	2	1
3	2	2		3	2	1

■Step3. Attribute reduction by rough set theory

In this step, we use rough set genetic algorithm execution attributes reduction to extract the relatively subset of attributes, which preserves all discernible information from the information system. The concept of attribute reduction has one or more attributes of the original table deleted,

and the remaining attributes can still achieve the classification performance of the original property. The attribute deleted are called unnecessary attributes, while the remaining property is called necessary attributes. Table 7 shows the reduction attribute set generated via attribute reduction of rough set theory.

Table 7: Reduction Attribute Set Generated by Rough Set Theory

(1-10)	Size	Pos.Reg.	SC	Reducts
1	4	1	1	{a1, a2, a10, a20}
2	5	1	1	{a8, a10, a20, a30, b4}
3	5	1	1	{a2, a20, a23, a33, b1}
4	5	1	1	{a1, a5, a14, a20, a31}
5	6	1	1	{a1, a8, a14, a20, a23, a30}
6	6	1	1	{a1, a7, a17, a24, a29, a33}
7	6	1	1	{a1, a10, a14, a20, a24, a26}
8	6	1	1	{a1, a8, a14, a23, a29, a30}
9	6	1	1	{a10, a11, a16, a23, a31, a32}
10	6	1	1	{a9, a20, a22, a29, a30, b4}

■**Step4. Data splitting**

In this step, we extract the necessary attributes (reduction attributes set) from the original dataset, and then use rough set split function to split the extracted dataset into two, both containing 22 records which are training datasets containing 11 listed companies and 11 unlisted companies, and testing datasets also containing 11 listed companies and 11 unlisted companies.

■**Step5. Generate decision rules by rough set rule induction method**

In this step, rough set rule induction method (genetic algorithm) is used to analyze the training dataset constructed in step 4. The rules produced by rough set rule induction method are in the form of "if-then" by combining several condition values with one decision value. For example, Table 8 demonstrates partly rules generated from Table 7 reduction set {a10, a11, a16, a23, a31, a32, d}.

In the case of generalized rules, decision values may be listed after "Then" as follows:

If (condition=(a10=2 & a16=2))Then (decision=(d={0[6]}))

In the case above, when the condition, a10=2 and a16=2 occurs, the decision value d=0; the value given in square brackets is the support case for the decision value, for example, 0[6] indicates that 6 cases occurred when the condition values a10=2 and a16=2, and the total support cases for this rule is 6.

Table 8: Partly Rules Generated from Table 7 Reduction Set

(1-29)	Match	Decision rules
1	6	(a10=2)&(a16=2)=>(d={0[6]})
2	4	(a16=1)&(a23=3)=>(d={1[4]})
3	4	(a10=3)=>(d={1[4]})
4	4	(a10=1)&(a23=3)=>(d={1[4]})
5	4	(a10=2)&(a23=1)=>(d={0[4]})
6	3	(a10=1)&(a16=1)=>(d={1[3]})
7	2	(a23=2)&(a31=1)=>(d={1[2]})
8	2	(a16=3)&(a31=1)=>(d={1[2]})
9	2	(a10=1)&(a31=1)=>(d={1[2]})
10	2	(a16=3)&(a23=1)&(a32=2)=>(d={1
11	2	(a10=2)&(a31=3)=>(d={0[2]})
12	2	(a16=1)&(a23=1)=>(d={0[2]})
13	2	(a16=3)&(a31=2)=>(d={0[2]})
14	2	(a32=3)=>(d={0[2]})
15	2	(a10=2)&(a23=2)=>(d={0[2]})
16	1	(a16=2)&(a23=1)&(a31=2)=>(d={1
17	1	(a23=1)&(a31=1)=>(d={1[1]})
18	1	(a10=1)&(a23=1)=>(d={1[1]})
19	1	(a10=1)&(a16=2)=>(d={1[1]})
20	1	(a11=1)=>(d={1[1]})
21	1	(a16=3)&(a31=3)=>(d={1[1]})
22	1	(a16=2)&(a31=3)=>(d={0[1]})
23	1	(a16=1)&(a31=3)=>(d={0[1]})
24	1	(a23=3)&(a31=1)=>(d={0[1]})
25	1	(a10=2)&(a31=1)=>(d={0[1]})
26	1	(a10=1)&(a23=2)&(a31=2)=>(d={0
27	1	(a16=1)&(a23=2)=>(d={0[1]})
28	1	(a32=1)=>(d={0[1]})
29	1	(a10=2)&(a16=3)=>(d={0[1]})

■**Step6. Training and testing dataset prediction result**

In this step, we use the decision rules created in step5, to evaluate the prediction accuracy of the proposed model. Table 9 shows the predicted results of the training dataset and testing dataset.

Table 9: Predicted Results of Training Dataset and Testing Dataset

Training predicted						
Actual		1	0	No. of Obj.	Accuracy	Coverage
	1	11	0	11	1	1
	0	0	11	11	1	1
	True positive rate	1	1			
Testing predicted						
Actual		1	0	No. of Obj.	Accuracy	Coverage
	1	9	2	11	0.818	1
	0	0	11	11	1	1
	True positive rate	1	0.85			

VERIFY THE PREDICTION ACCURACY OF THE PROPOSED MODEL

In this paper, to verify the prediction accuracy of the proposed model, we apply the Rough Set Exploration System (RSES) to the datasets we collected to conduct the training and testing prediction. This paper collects data period from 2002 to 2012 and formed them into five datasets, year-1 before unlisted, year-2 before unlisted, year-3 before unlisted, year-4 before unlisted, and year-5 before unlisted. Each dataset consists of 44 firms (22 listed and 22 unlisted) and is composed of 40 attributes including 39 condition attributes and one decision attribute (0: listed, 1: unlisted). We use RSES to extract the necessary attributes for every dataset and split every datasets into two sub-datasets (training dataset and testing dataset), so that RSES can apply the Genetic Algorithms to the training dataset, generating the decision rules, finally applying the decision rules to the training dataset and obtaining the prediction results. Table 10 shows the prediction results.

According to the Table 10, the prediction accuracy of the five training datasets all are 100% and the prediction accuracy of the testing datasets year-1, year-2, year-3, year-4, year-5 are 77.30%, 72.7%, 68.2%, 86.40%, and 90.90% respectively. Since the prediction accuracy of the year-5 dataset is the best, we further analyze the result of it. The detail is demonstrated in Table 11. The reduction attributes of it are a10 Fixed rate, a11 Operating Income, a16 Profit Margin, a23 Inventory turnover ratio, a31 Sales＜ Total Liabilities, and a32 Net income primarily from non-operating income and the times every attribute matches accounting for the percentage of the total are 29.36%, 0.92%, 25.69%, 23.85%, 16.51%, and 3.67% respectively.

Table 10: Prediction Results

Dataset Year-x before unlisted	Number of samples	Type of sub-dataset	Overall Prediction accuracy	Listed / unlisted	Number of Company Correctly predicted	Number of company Failed to correctly predicted	Prediction accuracy
Year-1	22	training	100%	1	11	11	100%
				0	11	11	100%
	22	testing	77.30%	1	9	2	81.80%
				0	3	8	72.70%
Year-2	22	training	100%	1	11	11	100%
				0	11	11	100%
	22	testing	72.70%	1	9	4	69.20%
				0	2	7	77.80%
Year-3	22	training	100%	1	10	10	100%
				0	12	12	100%
	22	testing	68.20%	1	9	2	81.80%
				0	5	6	54.50%
Year-4	22	training	100%	1	13	13	100%
				0	9	9	100%
	22	testing	86.40%	1	6	2	75.00%
				0	1	13	92.90%
Year-5	22	training	100%	1	11	11	100%
				0	11	11	100%
	22	testing	90.90%	1	9	2	81.80%
				0	0	11	100%

Table 11: Attributes Analysis of Year-5

Attribute 編號		times of match	Percentage
a10	Fixed rate	32	29.36%
a11	Operating Income	1	0.92%
a16	Profit Margin	28	25.69%
a23	Inventory turnover ratio	26	23.85%
a31	Sales＜Total Liabilities	18	16.51%
a32	Net income primarily from non-operating income	4	3.67%
Total		109	100%

The prediction result shows that the prediction accuracy is decreasing from the year-5 to the year-3 and becomes increasing from the year-2 to year-1. We think that the highest prediction accuracy falls on the year-5 instead of year-1 may be related to the issue of financial statement manipulation. The management of the company often tends to manipulate the financial statement, trying to conceal the signs of the financial crisis. That is the reason why the prediction accuracy is decreasing from year-5 to year-3. However, with the deterioration of the financial crisis, it is more and more difficult for the management to dress the financial statement and therefore the prediction accuracy for the last two years before unlisted becomes increasing. Furthermore, based on the Table 11, we can reach the conclusion that a10, a16, and a23 are the most important attributes in the prediction and may be the key indicators to exam the financial health of a company.

CONCLUSION

Financial crisis prediction has long been regarded as a critical topic and has been studied extensively in accounting and finance literature. This paper applies the rough set theory to analyze the relationship between the failure-signs of small and medium enterprises and the listed company. According to Table 10 results, it is clear that the failure-signs of small and medium enterprises are also applicable to predict the financial crisis of the listed companies. The results show that the overall accuracy for the first, second, third, fourth, and fifth year before the companies unlisted are 77.30%, 72.7%, 68.2%, 86.40%, and 90.90% respectively. These results are useful to those stakeholders that are able to take action to prevent failure. Furthermore, it is very useful for aiding investors when selecting firms to invest in, as well as being helpful for the pricing of loans. In this paper, the proposed model rough set theory reducts the attributes, forming the relatively simplified decision rules without altering the accuracy of the results. Moreover, the derived decision rules reveal the most relevant attributes to be considered by the stakeholders in order to take action to prevent failure or to aid investors when selecting which firms to invest in.

In conclusion, the results offer the following advantages: (1) It verifies that failure-signs observed from practice can predict the financial crisis with high accuracy. (2) It reveals important facts that the failure-signs of small and medium enterprises are also applicable to predict the financial crisis of the listed companies. And (3) It can be integrated into decision support system for the evaluation of corporate performance and viability, minimize the time and cost of the decision making process. (4) It suggests that the financial information of the fifth year before the company unlisted may reflect the financial health of the company more truly and that fixed rate, profit margin, Inventory turnover ratio are the important indicators to exam the financial health of a company.

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Comparison between Stock Synchronicity Measures – An Empirical Analysis

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ABSTRACT

In this paper, I analyse three measures of stock market synchronicity; the classical measure, the R square measure and the zero return measure proposed by Morck et al. (2000), Skaife et al. (2006) and Khandaker (2012). It is found that the classical measure and the R square measure exhibit somewhat similar aspects of stock market synchronous behaviour while the zero return measure provides a different finding. Further, cross-sectional analysis shows that inflation is generally positively correlated with the classical measure and the R-square measure, while it is negatively correlated with the zero return measure; and government accountability and trade openness is negatively correlated with the classical measure and the R-square measure whereas it is positively correlated with the zero return measure. Analysis of the correction coefficient shows that the classical measure is positively correlated with the R square measure while the zero return measure is negatively correlated with both these measures. The paper concludes that the classical measure and the R square measure of stock synchronicity are closely correlated while the zero return measure captures an aspect of stock market behaviour other than stock synchronicity.

JEL classification: G12, G14
Keywords:Synchronicity, Cross-Sectional Analysis, Classical Synchronicity Measure, R square Measure, Zero Return Measure

INTRODUCTION

Stock synchronicity can be explained in terms of the tendency of share market prices to move in the same direction over a particular period of time. Morck et al. (2000) argue that stock prices in economies with higher per capita gross domestic product (GDP) move in a relatively unsynchronised manner over time, in contrast to stock prices in lower per capita GDP economies. In addition, they propose two models to capture the tendency for stock return synchronicity. The first model captures the broad, market-wide movements in share prices for individual firms for a particular period, referred to as the Classical Synchronicity Measure. The second model is the market model of the R-square measure. This captures the level of firm-specific price movement that is reflected in overall share market prices. This study uses both these models to measure stock price synchronicity for developed and emerging markets. In addition, the study uses the zero-return synchronicity measure developed by Skaife et al. (2006) as a third measure of stock synchronicity.

The published literature in the area of stock market synchronicity is limited and this study contributes to the literature through its focus on emerging equity markets. I use all three measures of stock synchronicity that are proposed in earlier literature to apply to data to capture emerging markets' stock synchronicity and compare the findings with those in a selection of developed equity markets.

LITERATURE REVIEW

■Stock Synchronicity

Khandaker and Heaney (2008) and Khandaker (2012) are among the first who use large time series data for stock synchronicity analysis. They use stock market data from 41 countries that includes 34 emerging markets and seven developed markets. Using the classical synchronicity measure proposed by Morck et al (2000) we find that countries with lower stock synchronicity include Australia, France, Germany, New-Zealand, the UK and the USA, and countries with higher stock synchronicity include China, Turkey and Malaysia. They also find a significant positive correlation between stock synchronicity and inflation and a negative correlation with government accountability, corruption and geographical size.

Morck et al. (2000) argue that share prices in emerging stock markets move more closely together than those of developed markets. They use bi-weekly return data to measure stock return synchronicity for 40 countries and 15,920 firms. Morck et al. (2000) find that stock synchronicity is negatively correlated with a country's geographical size and positively correlated with GDP growth and earnings co-movements. They argue that a 'small country effect' causes the higher stock price co-movement found in smaller countries. This finding is supported by Levine and Zervos (1998) who argue that smaller countries often have unstructured financial markets leading to lower financial growth when compared to developed financial markets. In addition, Morck et al. (2000) find that stock price synchronicity could be affected by the number of stocks in a stock market. They argue that stock markets with fewer listed firms are more volatile and exhibit higher stock price synchronicity. Financial markets in emerging economies are more volatile in their view

because of a tendency for sharp changes in monetary policy and higher inflation rates. For example, a sudden change in monetary policy is a quite common phenomenon, along with changes in government, in a country such as Indonesia (Khandaker 2011a, Khandaker 2013).

Additionally, Morck et al. (2000) use three 'good governance' indices as proposed by La-Porta et al. (1998) in their cross-sectional analysis: government corruption, risk of expropriation by the government and risk of government repudiation of contracts. The indices range from zero (0) to ten (10), with zero indicating poor governance and 10 indicating strong governance. Morck et al.(2000) find that lower stock price co-movement exists in countries with better protection of private property rights and higher stock price co-movement exists in countries where private property rights are not strongly respected. They find that countries with poor protection of private property rights are mostly emerging countries, whereas higher levels of property rights protection are evident in developed economies (Morck et al., 2000, Jin and Mayers, 2004, Khandaker 2012). They also find that higher GDP per capita countries rank higher in good governance index values. For example, countries such as Germany, France, the UK and the USA score higher in the good governance indices and these countries also have higher GDP income per capita.

Li et al. (2003) argue that institutional reforms reduce the overall synchronicity of individual stock prices. They examine the Canadian stock market and compare this with Mexican and East Asian markets[1], finding that Canadian stocks move less synchronously than Mexican stocks. They argue that developed economies like Canada, with well-developed institutions, exhibit permanent increases in firm-specific stock return variation, whereas emerging economies, like Mexico, exhibit temporary increases in share price co-movement due to trade openness such as through NAFTA (North American Free Trade Agreement).

Chan and Hameed (2006) use the trading volume of stocks as a descriptive variable to explain stock price co-movement for individual firms. They found that the size of a firm has strong impact on market wide share price swings, and also when the number of stocks within a stock market is small a few large companies tend to dominate overall market movements. Thus, there is evidence of two approaches in the literature. While the first focuses on country level analysis, the second looks more closely at individual share based effects (Hutton et al., 2009).

Skaife et al. (2006) conduct five different analyses using the data from six sample countries including Australia, France, Germany, Japan, the UK and the USA. Their first analysis is based on the work of Morck et al. (2000), who suggest that stock synchronicity measures are associated with more informative prices from individual firms. Skaife et al. (2006) find that higher R-square values are associated with more informative stock market prices, while lower R square values are associated with less informative stock market prices. They argue that R-square statistics are not a reliable measure of stock market synchronicity based on their assumptions and propose an alternative model. They suggest that the proportion of zero-return days provides a simple, accurate measure that captures firm-specific information. Based on the work of Bekaert et al. (2003), they repeat their analysis using the zero-return measure and find a significant and consistent relationship between the zero-return measure and information proxies. They recommend the proportion of zero-return days[2] as a better measure of stock price synchronicity than the traditional models since this measure appears to capture the frequency of information arrival, which tends to result in lower zero-return days.

In addition Alves et al. (2010) and Xing and Anderson (2011) argue that the R-square measure is not a reliable model for assessing the quality of the information disclosure for country level data. They find that the R-square measure is based on implicit assumptions, such as the stability of a country, strength of corporate governance mechanisms and superior investor protection rights, which cannot be always accessible to investors.

The concept of stock market synchronicity is not new to the literature of finance and economics. For example, French and Roll (1986) and Roll (1988) argue that high stock prices and a well-informed market generate low stock synchronicity. Roll (1988) shows that the movement of stock prices depends on several related factors including firm-level and market-level information that is capitalised into stock prices. They find that USA stock returns are more volatile during exchange trading hours compared with non-trading hours. They argue that private information is the principal factor behind high trading time variance. Conversely, both French and Roll (1986) and Roll (1988) suggest that most variations in stock prices reflect proprietary firm-specific information.

■ **Co-movement across international markets**

Karolyi and Stulz (1995) investigate the co-movement between the USA and Japanese stock markets focusing on daily stock return data. They find evidence that the USA and the Japanese cross-country return covariance exhibits a strong 'day of the week' effect and covariance is higher for Monday returns than for other days. They also find evidence that firm covariance in returns is not as high on days of USA macroeconomic announcements. Further, Nguyen and Aman (2006)

[1] Li et al. (2003) use *R-square* synchronicity measures for their cross-sectional analysis.
[2] Alternatively, zero-return metric.

find that corporate governance mechanisms are positively correlated with higher stock price valuation and market valuation in the Japanese stock market.

Dasgupta et al. (2006) argue that corporate transparency and stock price synchronicity are strongly correlated, suggesting that greater transparency indicates early and timely disclosure of firm-specific information. Accordingly, stock synchronicity decreases as corporate disclosure and greater transparency increase (Wurgler, 2000). In addition, Bissessur and Hodgson (2012) and Dasgupta et al. (2010) suggest that stock prices depend upon market and industry wide information which reflect firm specific information as idiosyncratic dependency.

Most of the published literature concentrates on firm-level cross-sectional analysis rather than country-level analysis of stock synchronicity. For example, Durnev et al. (2004a) use corporate diversification, industry size, leverage, advertising spending and research and development (R&D) spending; Durnev et al. (2004b) use industry size and industry structure variables; Baker et al. (2003) use market capitalisation of the firm, growth rate, market value traded and growth rate of sales variables, while Skaife et al. (2006) use R & D expense, analyst earnings forecast, proportion of shares traded, standard deviation of sales, standard deviation of return on assets (ROA), market value of equity and average weekly turnover.

Further, a suite of country-level indicator variables has become available in recent times and the explanatory power of these variables is a primary focus of this current analysis. They include corporate transparency, political stability, regulatory control and trade openness; although this study also includes commonly used control variables such as GDP per capita, inflation and country size for the analysis of stock synchronicity in emerging markets.

DATA

The study uses stock market data for 34 emerging markets and seven developed economies. The emerging markets are taken from a range of geographical locations. The main criteria for selecting emerging markets include geographical location, legal origin, size of the equity market and the availability of data from *DataStream.*

Table 1 : Legal origin of selected countries
Based on the legal system of the country

Common law countries	Civil law countries	Post-communist	Developed countries
Bangladesh	Argentina	China	Australia
Cyprus	Brazil	Poland	France
Egypt	Chile	Russia	Germany
Hong Kong	Columbia		Japan
India	Czech Republic		New Zealand
Kenya	Ecuador		UK
Malaysia	Greece		USA
Pakistan	Hungary		
South Africa	Indonesia		
Singapore	Korea		
Sri-Lanka	Mexico		
Zimbabwe	Peru		
	Philippines		
	Portugal		
	Spain		
	Taiwan		
	Thailand		
	Turkey		
	Venezuela		

This study divides emerging economies into three basic categories: English-based common law countries; French- and German-based civil law countries and the former communist states. Developed economies are not classified into any specific legal origin but are allocated into a single category.

Table 1 provides a list of the selected emerging countries and developed countries used in this study. The list contain 12 emerging countries of common law origin, 19 emerging countries of civil law origin, three countries of post-communist origin and the seven developed countries. The sample size from the post-communist countries is three, owing to a lack of reliable data for other countries that fall within this classification. Time-series data is collected from the DataStream database at the individual firm level for each of the countries. The data spans the period from January 1996 to December 2005 and is collected at weekly intervals for synchronicity analysis. The study uses two samples from the USA stock market, the New-York Stock Exchange (NYSE) with 4,049 firms and S&P 500 with 500 listed firms. However, the study uses the NYSE (USA) firms for stock synchronicity analysis and comparison with the emerging economies.

Table 2: List of available firms from DataStream database[3]

Country	No of firms	Country	No of firms
Argentina	216	Malaysia	1,316
Australia	2,709	Mexico	646
Bangladesh	256	New Zealand	269
Brazil	1,179	Pakistan	413
Chile	274	Peru	370
China	1,905	Philippines	379
Columbia	128	Poland	393
Cyprus	144	Portugal	122
Czech Republic	243	Russia	623
Ecuador	35	Singapore	1,075
Egypt	127	South Africa	1,546
France	1,527	Spain	338
Germany	1,506	Sri-Lanka	301
Greece	443	Taiwan	1,145
Hong Kong	2,705	Thailand	1,236
Hungary	209	Turkey	515
India	2,158	UK	2,707
Indonesia	588	NYSE (USA)	4,049
Japan	2,842	Venezuela	111
Kenya	62	Zimbabwe	100
South Korea	2,604		
		Total firms	40,014

Table 2 illustrates the number of firms for which data is available for each of the emerging and developed countries. In total, data for 40,014 firms is collected, which includes approximately 20.8 million weekly firm observations.

GDP per capita and inflation data were collected from the International Monetary Fund[4] (IMF) and the World Bank (2007) databases. In addition, this study uses five panels for cross-sectional analysis and two-year averages of historical data for each panel (e.g. GDP per capita, inflation, regulatory control, corruption rate and voice and accountability).

Geographical size data for the sample countries is collected from the CIA (2007) world factbook[5]. The CIA world factbook is published by the Central Intelligence Agency, USA. The CIA website provides accurate and reliable country-level data including geographical size. Corporate governance index data are collected from the World-Bank database[6] and corruption index data are collected from Transparency International[7].

■ **Trade Openness Measure**

The study also uses the trade openness measure variable for the stock market synchronicity analysis. It is argued that more open economies have a lower level of stock synchronicity than less open economies. Further, post-communist countries used to have closed economic and political policies compared with common law countries. La-Porta et al. (1998) argue that post-communist countries provide very little protection to their market shareholders. This study uses the trade openness measure developed by Li et al. (2003) as follows.

$$[Trade\,Openness] = \frac{I_{nt}}{GDP_{nt}} - \left(1 - \frac{GDP_{nt}}{\sum_{n} GDP_{nt}}\right) \quad (1)$$

Here I_{nt} is the total imports of a country n in year t and GDP_{nt} is the gross domestic product (GDP) for country n for the same period. $\sum_{n} GDP_{nt}$ is the world aggregate GDP at period t. The trade openness measure calculates the total domestic consumption = one minus the nation's share of world production (country GDP / world aggregate GDP). The value of the individual country openness measure is zero. In a completely closed economy, this measure is negative one plus the country's GDP as a fraction of world GDP. However, as the economy becomes more and more open, the measure shifts toward a zero value.

I collect the total import data and country GDP data from the *DataStream* database and then calculates the trade openness measure using the above formula (equation i). I use the two-year average trade openness measure for the cross-sectional analysis. It should be noted that it is possible to have a

[3] As at February, 2007
[4] http://www.imf.org/external/index.htm
[5] https://www.cia.gov/library/publications/the-world-factbook/
[6] https:// www.worldbank.org/wbi/governance/data
[7] http://www.transparency.org/

positive trade openness measure for entrepôt[8] countries. However, my trade openness variable is always negative for the sample countries, except for Singapore and Hong Kong, consistent with Li et al. (2003).

METHODOLOGY

As noted earlier, this study uses the two measures of stock synchronicity proposed by Morck et al. (2000) and Li et al. (2003) comprising:

1. Classical synchronicity measure
2. R-square measure

A third model of stock synchronicity proposed by Skaife et al. (2006), known as the zero-return measure is added for completeness.

■Classical Measure

The classical synchronicity measure analyses market-wide share price movement in a particular period and focuses on the tendency of stocks to move in the same direction across the market. The following equation illustrates the classical synchronicity measure:

$$f_{jt} = \frac{MAX\left[n_{jt}^{up}, n_{jt}^{down}\right]}{n_{jt}^{up} + n_{jt}^{down}} \tag{2}$$

Where, f_{jt} is the net change in price (whether up or down) of the stock of country j in week t, n_{jt}^{up} is the number of stocks in country j where prices rise in week t and n_{jt}^{down} is the number of stocks where prices fall. This measure has a maximum of 1.0 for markets where the share prices are perfectly synchronised and a minimum of 0.5 where there are equal numbers of shares rises and falls over the period, consistent with a market where prices are not synchronised.

■R square Measure

The R-square synchronicity measure is the most popular model in the literature for capturing stock market synchronicity (Khandaker and Heaney 2000; Skaife et al. 2006; Morck et al. 2000). This measure can be explained as follows.

$$R_{i,t} = \alpha_i + \beta_i R_{m,it} + \varepsilon_{i,t} \tag{3}$$

Where $R_{i,t}$ is the firm i return for period t, $R_{m,it}$ is the market return of firm i for t period, $\varepsilon_{i,t}$ is the error term and α_1 and β_i are estimated parameters. The R^2 is the percentage of variation in weekly return of stock i in country j explained by variations in country j 's market return. However, the R square measure can be explained as the following.

$$R_{it}^2 = \left(\frac{Cov(R_i\ R_m)}{\sigma_i\ \sigma_m} \right)^2 \tag{4}$$

Where Cov($R_i R_m$) is the covariance between the share returns and share market returns, σ_i is the standard deviation for asset i and σ_m is the standard deviation of market. A high R^2 indicates a high degree of stock return synchronicity and a low R^2 indicates a low degree of stock return synchronicity for a given stock for a particular period of time.

■Zero Return Measure

The zero-return measure is a comparatively new model for capturing stock market synchronicity. Skaife et al. (2006) first proposed this measure, claiming that it is a better model than both the classical measure and the R-square measure to capture stock synchronicity. They argue that marginal investors have information about share prices in the market. If the value of an information signal is insufficient to exceed the trading cost, then the marginal investor will not trade the share and there is no change in price, leading to zero-return days.

The proportion of zero-return days is measured by calculating the number of zero-return trading days over a fiscal year divided by the total number of trading days in that fiscal year. A zero-return day is a day on which the price of a particular share does not change. The zero-return measure is calculated as follows:

$$NOZRD = \frac{No\ of\ Zero\ \text{Re}turn\ Days}{Total\ Trading\ Days\ in\ the\ Year} \times 100 \tag{5}$$

A high zero return days number indicates a more synchronous economy and a low number of zero return days indicates a less synchronous economy.

[8] An entrepôt (from the French 'warehouse') is a trading post where merchandise can be imported and exported without paying import duties, often at a profit. (http://en.wikipedia.org/wiki/Entrep%C3%B4t)

■Cross sectional analysis model

This study uses the following cross sectional model to explain stock return synchronicity by using the classical measure; the R square measure and the zero return measure.

$$SYNC_{it} = \alpha + \beta_1 RC_{it} + \beta_2 VC_{it} + \beta_3 IN_{it} + \beta_4 CP_{it} + \beta_5 GDP_{it} + \beta_6 SIZE_{it} + \beta_7 TR_{it} + \varepsilon_{it} \quad (6)$$

Where for each country i in year t $SYNC_{it}$ represents stock return synchronicity and α is a constant**.** RC_{it} is the regulatory control index, VC_{it} is the voice and accountability index, IN_{it} is the inflation rate, CP_{it} is the corruption perception index, GDP_{it} is the gross domestic product per capita/ 10,000, TR_{it} is the trade openness measure, $SIZE_{it}$ is geographical size and ε_{it} is the error term. The natural log of geographical size is used to minimize the impact of skewness in this variable.

ANALYSIS OF DATA

■Descriptive Statistics Analysis

Table 3 exhibits full period descriptive statistics analysis for 41 countries using the three synchronicity measures. It is found that Australia, Germany and the NYSE exhibit a low level of stock synchronicity using the classical measure and the R square measure, though these countries exhibit a greater zero return measure for the same sample period. In addition, the S&P 500 group of companies exhibit a higher synchronicity measure (the classical measure) while producing a lower zero return measure during this sample period, which is surprising.

In contrast, countries exhibiting greater stock synchronicity using the classical measure and the R square measure exhibit a lower zero return measure. For example, China, Malaysia and Turkey exhibit highest stock synchronicity using the R square measure and the classical measure, while exhibiting a lower zero return measure during the sample period. This suggests the zero return measure of stock synchronicity captures a somewhat different aspect of stock market synchronous behaviour while the classical measure and the R square measure are more closely correlated.

Table 3: Descriptive Statistics Analysis

	Classical Measure			R Square Measure			Zero Return Measure		
	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.	Mean	Median	Std. Dev.
Argentina	0.69	0.68	0.11	0.10	0.04	0.14	59.1	64.3	36.6
Australia	0.58	0.56	0.07	0.04	0.02	0.09	42.8	30.1	34.9
Bangladesh	0.68	0.68	0.12	0.02	0.01	0.05	22.6	11.9	25.4
Brazil	0.64	0.64	0.09	0.07	0.01	0.13	61.9	74.9	36.0
Chile	0.65	0.64	0.09	0.10	0.02	0.15	49.4	52.1	34.1
China	0.73	0.74	0.13	0.24	0.26	0.13	11.5	4.2	19.5
Columbia	0.66	0.65	0.11	0.04	0.00	0.10	77.5	93.2	29.8
Cyprus	0.69	0.67	0.12	0.16	0.12	0.16	26.9	21.4	19.4
Czech Rep.	0.61	0.59	0.08	0.03	0.01	0.08	59.7	62.9	23.1
Ecuador	0.75	0.71	0.18	0.03	0.00	0.16	84.3	94.5	22.9
Egypt	0.65	0.65	0.10	0.09	0.04	0.12	26.8	13.8	30.0
France	0.61	0.60	0.08	0.10	0.03	0.16	23.7	9.8	28.4
Germany	0.59	0.58	0.06	0.01	0.00	0.07	31.3	17.9	31.6
Greece	0.72	0.71	0.13	0.01	0.00	0.02	14.9	4.8	23.5
Hong Kong	0.65	0.63	0.10	0.02	0.00	0.06	41.6	33.8	30.6
Hungary	0.65	0.64	0.10	0.10	0.02	0.17	57.9	62.2	36.6
India	0.65	0.65	0.10	0.08	0.03	0.11	48.3	52.1	38.2
Indonesia	0.68	0.67	0.11	0.10	0.05	0.13	52.6	47.9	29.0
Japan	0.67	0.66	0.11	0.01	0.00	0.06	12.9	5.2	20.3
Kenya	0.61	0.59	0.09	0.01	0.00	0.02	45.3	34.0	31.7
Korea	0.68	0.66	0.11	0.12	0.09	0.12	23.1	5.6	30.9
Malaysia	0.73	0.71	0.13	0.25	0.26	0.18	26.5	13.4	27.7
Mexico	0.66	0.65	0.10	0.09	0.01	0.16	66.6	81.1	36.5
New Zealand	0.62	0.60	0.09	0.07	0.03	0.10	27.1	20.7	20.7
Pakistan	0.67	0.66	0.10	0.08	0.01	0.15	53.3	55.0	33.5
Peru	0.65	0.65	0.09	0.02	0.00	0.06	74.1	90.2	32.0
Philippines	0.65	0.64	0.10	0.07	0.02	0.12	59.2	61.3	30.7
Poland	0.66	0.63	0.12	0.07	0.03	0.09	28.1	11.7	29.8
Portugal	0.63	0.62	0.09	0.10	0.04	0.14	35.1	20.5	33.7
Russia	0.70	0.69	0.12	0.07	0.01	0.14	64.6	77.5	33.2
Singapore	0.69	0.67	0.12	0.02	0.01	0.06	35.9	26.2	28.6
South Africa	0.60	0.59	0.07	0.05	0.02	0.09	56.2	62.4	32.1
Spain	0.66	0.64	0.10	0.08	0.04	0.12	24.8	9.3	31.0
Sri-Lanka	0.67	0.65	0.11	0.12	0.04	0.16	55.0	52.8	29.5
Taiwan	0.69	0.68	0.13	0.17	0.16	0.13	16.8	5.6	25.4
Thailand	0.66	0.66	0.10	0.11	0.03	0.17	53.6	56.0	37.8
Turkey	0.75	0.75	0.13	0.24	0.22	0.18	30.0	9.6	32.4
UK	0.63	0.62	0.09	0.07	0.02	0.14	38.5	31.0	31.1
S&P 500	0.67	0.66	0.11	0.14	0.13	0.08	1.4	1.1	1.0
USA	0.63	0.62	0.09	0.03	0.01	0.06	25.1	6.3	35.4
Venezuela	0.67	0.65	0.12	0.07	0.02	0.12	69.3	77.2	29.8

Zimbabwe	0.67	0.64	0.11	0.12	0.08	0.13	44.5	30.2	29.1
Average	0.66			0.084			42.9		
Developed	0.62			0.045			28.8		
Emerging	0.67			0.091			45.7		

It is found that stock synchronicity measures are stationary over the period of the study and there is a statistically significant difference in the mean variance between the emerging country group and the developed country group at the 1 per cent level for the classical measure and 10 per cent level for the R square and the zero return measure (Panels A, B and C of table A1 in the Appendix).

Further, to check the possibility of changes in the level of stock market synchronisation during the observation period from 1996 to 2005, the time series was divided into five sub-periods, 1996-97, 1998-99, 2000-01, 2002-03 and 2004-05. Table A2 in the Appendix illustrates the descriptive statistics for stock synchronicity over the five sub-periods using the classical measure; the R square measure and the zero return measure.

■ Panel Data Comparison

Table 4 exhibits the panel data analysis for all countries (emerging and developed countries), developed countries and emerging economies groups using the classical synchronicity measure, the R-square measure and the zero-return measure.

One common feature of the panel data analysis is the positive correlation between regulatory control and stock market synchronicity using all three synchronicity measures. Regulatory control is found to be an important variable for the R-square and classical measures, though the impact is not statistically significant for the zero-return measure. Except for the developed country group, corruption is negatively correlated with the classical synchronicity measure and the zero-return measure, but this effect is mostly positive for the R-square measure. There is also evidence that trade openness and log geographical size has a greater role for the zero-return measure than the classical synchronicity or the R-square measure.

In addition, inflation is positively correlated with the R-square measure for the all-country and the emerging country groups at the one per cent significance level. However, the effect is not statistically significant for the other synchronicity measures, though mostly it is positively correlated with the classical measure. Surprisingly, inflation is negatively correlated with the zero-return measure except for the developed country group, although the effect is not statistically significant. These results suggest a negative correlation between the zero-return measure and the two other measures of stock synchronicity.

It is often argued by academic researchers that higher inflation causes higher levels of stock synchronicity. For example, Morck et al. (2000) find that Turkey and Malaysia exhibit higher stock synchronicity and both countries also exhibit high inflation during their study period. It is found that inflation is positively correlated with the classical and R-square measures. However, the results from the zero-return measure conflict with the classical measure, the R-square measure and the results of Morck et al. (2000).

Further, emerging countries that exhibit greater stock synchronicity using the classical measure and the R-square measure surprisingly exhibit a low zero-return measure during the observation period. For example, China and Malaysia exhibit a low zero-return measure (China 11.5 per cent and Malaysia 26.5 per cent) relative to the mean of 42.9 per cent, even though both exhibit high stock synchronicity. In contrast, Australia exhibits lower stock synchronicity using the classical measure (58 per cent) and the R-square measure (0.041) but exhibits a greater zero-return measure than the other developed economies sampled. These results suggest that the zero-return measure captures somewhat different aspects of stock market behaviour rather than stock synchronicity.

Table 4: Summary panel data analysis results

The results reported in this table are based on the following model:

$$Stock\,Synchronicity\,Measure_{it} = \alpha + \beta_1\ RC_{it} + \beta_2\, VC_{it} + \beta_3\, IN_{it} + \beta_4\, CP_{it} + \beta_5\, GDP_{it} + \beta_6\, SIZE_{it} + \beta_7\, TR_{it} + \varepsilon_{it}$$

where $Stock\ Synch\ Measure_{it}$, the dependent variable, is the stock synchronicity measure and α is a constant. Control (RC) is regulatory control index, Corruption (CP) is the corruption index produced by Transparency International, GDP is gross domestic product per capita / 10,000, Inflation (IN) is the inflation rate of a country, Trade (TR) is the trade openness measure, Accountability (VC) is the voice and accountability index and Size (SIZE) is the natural log of the geographical size of a country. Two values are reported below the estimated coefficient. The first, in parenthesis, is the t statistic using White (1980) adjusted standard errors and the second, in brackets, is the P value for the statistic.

	Classical synchronicity measure			R-square measure			Zero-return measure		
Variables	All	Developed	Emerging	All	Developed	Emerging	All	Developed	Emerging
Control	**0.01603**	**0.00951**	**0.00972**	**0.04639**	**0.05171**	**0.03728**	**0.77944**	**18.09835**	**1.67845**
	(3.83)	(1.83)	(1.98)	(2.98)	(1.30)	(2.63)	(0.35)	(2.28)	(0.69)
	[0.00]	[0.08]	[0.05]	[0.00]	[0.21]	[0.01]	[0.73]	[0.03]	[0.49]
Corruption	**-0.00789**	**0.00953**	**-0.00317**	**0.00407**	**-0.01595**	**0.01030**	**-2.75819**	**-2.11969**	**-4.84351**
	(-5.48)	(31.25)	(-1.21)	(1.46)	(-0.91)	(7.58)	(-5.13)	(-0.81)	(-3.46)
	[0.00]	[0.00]	[0.23]	[0.15]	[0.37]	[0.00]	[0.00]	[0.43]	[0.00]
GDP	**0.00325**	**0.01262**	**0.01198**	**-0.03399**	**-0.05327**	**-0.01677**	**-7.96318**	**2.64978**	**-7.37127**
	(1.62)	(1.04)	(1.77)	(-8.05)	(-3.15)	(-1.86)	(-6.07)	(0.68)	(-3.40)
	[0.11]	[0.31]	[0.08]	[0.00]	[0.01]	[0.07]	[0.00]	[0.50]	[0.00]
Inflation	**0.00018**	**-0.00273**	**0.00020**	**0.00064**	**0.00912**	**0.00065**	**-0.00296**	**0.59291**	**-0.01335**
	(1.15)	(-0.81)	(1.18)	(6.71)	(0.78)	(7.62)	(-0.13)	(0.83)	(-0.53)
	[0.25]	[0.42]	[0.24]	[0.00]	[0.44]	[0.00]	[0.90]	[0.41]	[0.60]
Trade	**-0.01257**	**0.04789**	**-0.01726**	**-0.01346**	**0.17039**	**-0.00861**	**27.77115**	**-61.80561**	**33.89200**
	(-1.18)	(0.56)	(-1.32)	(-0.58)	(2.13)	(-0.33)	(11.27)	(-2.66)	(14.65)
	[0.24]	[0.58]	[0.19]	[0.57]	[0.04]	[0.74]	[0.00]	[0.01]	[0.00]
Accountability	**-0.02376**	**-0.12679**	**-0.02129**	**-0.03340**	**-0.07945**	**-0.03039**	**7.88461**	**25.21017**	**8.31786**
	(-6.39)	(-3.09)	(-6.45)	(-3.28)	(-1.07)	(-2.91)	(3.66)	(1.67)	(3.94)
	[0.00]	[0.01]	[0.00]	[0.00]	[0.30]	[0.00]	[0.00]	[0.11]	[0.00]
Log (Size)	**-0.00381**	**-0.00355**	**-0.00044**	**0.00689**	**-0.00755**	**0.01455**	**3.76442**	**2.50366**	**3.68596**
	(-3.45)	(-1.10)	(-0.35)	(2.45)	(-1.26)	(4.29)	(30.98)	(6.58)	(17.52)
	[0.00]	[0.28]	[0.73]	[0.02]	[0.22]	[0.00]	[0.00]	[0.00]	[0.00]
R-square	0.269	0.614	0.128	0.240	0.460	0.210	0.360	0.740	0.330

Accountability is negatively correlated with the classical measure and the R-square measure at the one per cent significance level, with the exception of the R-square measure for the developed country group. However, the zero-return measure is positively correlated with accountability for all three country groups (the all-country, the developed country and the emerging country groups). This result conflicts with the classical measure and the R-square measure and is also inconsistent with the findings of Morck et al. (2000).

Geographical size exhibits a negative correlation with the classical synchronicity measure, although it is statistically significant only for the all-country group. This is an expected result as it is assumed that larger capital markets are less synchronous than small capital markets due to the financial market size. However, geographical size shows a somewhat mixed correlation with the R-square synchronicity measure. In contrast, geographical size is positively correlated with the zero-return measure at the one per cent significance level for all groups. It is found that this result is mainly driven by the large countries that exhibit high R-square values (such as China) and high zero-return measures (such as Russia and Mexico) during the observation period. In addition, GDP per capita is positively correlated with the classical synchronicity measure, though this effect is mainly negative for the R-square measure and the zero-return measure at the 10 per cent significance level, except for the developed country group.

The overall results suggest that the classical measure and the R-square measure capture somewhat similar images of stock markets' synchronicity, whereas the zero-return measure captures a somewhat different aspect of stock market behaviour. Skaife et al. (2006) analyse the zero-return measure for six sample developed countries. If, as seems possible, the zero-return measure does capture different aspects of stock markets from the other measures, then implications arise for the developed financial markets. However, there is some doubt about the implementation of the zero–return measure in emerging economies like China and Malaysia, where stocks are heavily traded (Khandaker 2011b, Ho and Zhang 2012).

■ **Correlation between synchronicity measures**

Table 5 exhibits the correlation between the classical measure, the R-square measure and the zero-return measure over the study period from January 1996 to December 2005. Further, the data is divided into three sub-sets, the all-country group (developed and emerging countries), the emerging country group and the developed country group.

Table 5 illustrates that the classical measure is positively correlated with the R-square measure at the one per cent significance level for the all-country group. In addition, both the classical measure and the R-square measure are negatively correlated with the zero-return measure, though the effect is only statistically significant for the R-square measure with the zero-return measure correlation-coefficient at the 10 per cent significance level for the all-country and the emerging country groups.

Further, correlation-coefficients for the emerging country synchronicity show that the classical synchronicity measure is positively correlated with the R-square measure and negatively correlated with the zero-return measure, which is consistent with the cross-sectional analysis. The developed country group, on the other hand, shows somewhat mixed correlation between the synchronicity

measures. For example, the R-square measure shows positive correlation with the zero-return measure, although the effect is not statistically significant. This may result from the small sample size that is used for the developed economies.

Table 5: Correlation between synchronicity measures

The classical synchronicity measure, the R-square measure and the zero-return measure

The value in parentheses is the P value for the correlation-coefficient. Values in bold including star '*' indicate that the coefficient is statistically significant at the 5 per cent level. Values in bold without star indicate significance at the 10 per cent level. The data span the period from January 1996 to December 2005. The sample includes 41 countries for the all-country group, 34 emerging countries for the emerging country group and seven developed countries for the developed country group.

All countries	Classical synchronicity measure	R-square measure
R-square measure	**0.508***	
	(0.00)	
Zero-return measure	-0.078	**-0.272**
	(0.63)	(0.09)
Emerging countries	Classical synchronicity measure	R-square measure
R-square measure	**0.500***	
	(0.00)	
Zero-return measure	-0.269	**-0.429***
	(0.12)	(0.01)
Developed countries	Classical synchronicity measure	R-square measure
R-square measure	-0.153	
	(0.74)	
Zero-return measure	**-0.746**	0.185
	(0.05)	(0.69)

Spearman rank correlation coefficients are also reported in table 6 with little change in the results. There is evidence of positive correlation between the classical measure and the R-square measure at the five per cent significance level for the all-country and emerging country groups, whereas the zero-return measure is negatively correlated with the R-square measure and the classical measure at the 10 per cent significance level for the emerging country group. Further, the developed country group shows some negative correlation between the classical measure and the R-square measure but the effect is not statistically significant. This suggests that a strong correlation exists between the classical measure and the R-square measure, whereas the zero-return measure is capturing a picture different from stock market co-movement.

In addition, to check whether the same effect also appears in synchronicity measures for sub-periods, the full period data is further divided into five sub-periods. The sub-periods are 1996-97, 1998-99, 2000-01, 2002-03 and 2004-05. Table 7 exhibits the correlation-coefficients of synchronicity measures for the above sub-periods. It is found that the R-square measure is positively correlated with the classical measure in each of the sub-periods in both the all-country and the emerging country groups, although the effect is only statistically significant for 2000-01 and 2002-03 at the five per cent level; for 2004-05 at the 10 per cent significance level for the all-country group; and for 1996-97 and 2000-01 at the five per cent level and 2002-03 at the 10 per cent level for the emerging country group.

The zero-return measure is negatively correlated with the classical measure and the R-square measure for every sub-period for the all-country and emerging country groups, with the exception of the classical measure in 1996-97 and the R square measure in 2004-05. However, the correlation-coefficient for the developed economies shows some variation between synchronicity measures, possibly due to the small sample size. Correlation-coefficients for the developed economies are mixed; however, this effect disappears when the developed economies and the emerging economies are merged into a single group (the all-country group).

Table 6: Spearman rank correlation-coefficient for synchronicity measures: Full period

Values in bold including star '*' indicate that the correlation-coefficient is statistically significant at the 5 per cent level and values in bold without star indicate significance at the 10 per cent level. The sample includes 41 countries for the all-country group, 34 emerging countries for the emerging country group and five developed countries for the developed country group. The data span the period from January 1996 to December 2005.

All countries	Classical measure	R-square measure
R-square measure	**0.370***	
	(0.02)	
Zero-return measure	-0.148	-0.145
	(0.36)	(0.37)
Emerging countries	Classical measure	R-square measure
R-square measure	**0.353***	
	(0.04)	
Zero-return measure	**-0.307**	**-0.327**
	(0.08)	(0.06)
Developed countries	Classical measure	R-square measure
R-square measure	-0.174	
	(0.71)	
Zero-return measure	-0.595	0.109
	(0.16)	(0.82)

The Spearman rank correlation-coefficients are included as a robustness test. It is found that Spearman rank correlation-coefficients also capture the same trend between the synchronicity measures for the observed sub-periods. There is evidence that the R-square measure is positively correlated with the classical measure for each of the sub-periods except for the developed country group in 1996-97, 1998-99 and 2004-05, and negatively correlated with the zero-return measure for every sub-period except for the all-country group in 2004-05 and the developed country group in 1998-99 and 2002-03 (see table 8), although none of these correlations is statistically significant. It seems that the small sample size of the developed country group renders it erratically uncorrelated with the R-square measure and the classical measure. In addition, the classical measure shows negative correlation with the zero-return measure for all sub-periods, except in 1996-97 for the all-country group and the emerging country group.

The correlation coefficient results for the sub-periods are consistent with the full period analysis. There is evidence of a positive correlation between the classical measure and the R-square measure for the full period and sub-periods, though this effect is mostly negative for the zero-return measure. These correlation coefficient analyses are also consistent with the cross-sectional analyses that are discussed in table 4.

Table 7: Correlation-coefficient of synchronicity measures: Sub-period analysis

(The classical measure, the R-square measure and the zero-return measure)

Here, CS is the classical synchronicity measure, RS is the R-square synchronicity measure and the ZS is the zero-return measure. The value in parenthesis is the P value for the correlation-coefficient. Values in bold including star '*' indicate statistically significance at the 5 per cent level and values in bold without star indicate significance at the 10 per cent level. The sample includes 41 countries in the all-country group, 34 emerging countries in the emerging country group and five developed countries in the developed country group. The sample includes five sub-periods, which are 1996-97, 1998-99, 2000-01, 2002-03 and 2004-05.

	1996-97		1998-99		2000-01		2002-03		2004-05	
All countries	CS	RS	CS	RS	CS	RS	CS	RS	CS	RS
R-square measure	0.221		0.247		**0.472***		**0.371***		**0.290**	
	(0.17)		(0.12)		(0.00)		(0.02)		(0.07)	
Zero-return measure	0.227	**-0.302**	-0.027	-0.229	-0.210	**-0.305**	-0.131	**-0.313**	-0.213	0.066
	(0.15)	(0.06)	(0.87)	(0.15)	(0.19)	(0.05)	(0.41)	(0.05)	(0.18)	(0.68)
Emerging countries	1996-97		1998-99		2000-01		2002-03		2004-05	
R-square measure	**0.500***		0.171		**.442***		**0.302**		0.203	
	(0.00)	.	(0.33)		(0.01)		(0.08)		(0.25)	
Zero-return measure	-0.269	**-0.429***	-0.083	**-0.335**	**-.389***	**-0.427***	**-0.324**	**-0.469***	**-0.394***	-0.046
	(0.12)	(0.01)	(0.63)	(0.05)	(0.02)	(0.01)	(0.06)	(0.01)	(0.02)	(0.80)
Developed countries	1996-97		1998-99		2000-01		2002-03		2004-05	
R-square measure	-0.022		-0.085		0.119		0.087		-0.203	
	(0.96)		(0.86)		(0.80)		(0.85)		(0.66)	
Zero-return measure	**-0.677**	-0.01	**-0.771***	-0.028	-0.631	-0.132	**-0.780***	-0.034	**-0.712**	-0.376
	(0.10)	(0.98)	(0.04)	(0.95)	(0.13)	(0.78)	(0.04)	(0.94)	(0.07)	(0.41)

Table 8: Spearman rank correlation-coefficient for synchronicity measures: Sub-periods

Where CS is the classical synchronicity measure, RS is the R-square synchronicity measure and the ZS is the zero-return measure. The value in parenthesis is the P value for the correlation-coefficient. Values in bold including star '*' indicate statistical significance at the 5 per cent level and values in bold without star indicate significance at the 10 per cent level. The sample includes 41 countries in the all-country group, 34 emerging countries in the emerging country group and five developed countries in the developed country group. The sample includes five sub-periods, which are 1996-97, 1998-99, 2000-01, 2002-03 and 2004-05.

	1996-97		1998-99		2000-01		2002-03		2004-05	
All countries	CS	RS	CS	RS	CS	RS	CS	RS	CS	RS
R-square measure	0.153		0.069		**0.319***		0.252		**0.266**	
	(0.34)		(0.67)		(0.04)		(0.11)		(0.09)	
Zero-return measure	0.206	-0.19	-0.028	-0.155	-0.156	-0.151	-0.112	-0.168	-0.245	0.076
	(0.20)	(0.23)	(0.86)	(0.33)	(0.33)	(0.35)	(0.48)	(0.29)	(0.12)	(0.64)
Emerging countries	**1996-97**		**1998-99**		**2000-01**		**2002-03**		**2004-05**	
R-square measure	0.062		0.171		**0.298**		0.142		0.203	
	(0.73)		(0.33)		(0.09)		(0.42)		(0.25)	
Zero-return measure	0.299	**-0.321**	-0.083	**-0.335***	**-0.343***	-0.257	**-0.299**	**-0.350***	**-0.394***	-0.046
	(0.09)	(0.06)	(0.64)	(0.05)	(0.05)	(0.14)	(0.09)	(0.04)	(0.02)	(0.80)
Developed countries	**1996-97**		**1998-99**		**2000-01**		**2002-03**		**2004-05**	
R-square measure	-0.055		-0.138		0.094		0.009		-0.040	
	(0.91)		(0.77)		(0.84)		(0.98)		(0.93)	
Zero-return measure	-0.487	-0.018	-0.546	0.036	-0.593	-0.127	-0.577	0.200	**-0.739**	-0.394
	(0.27)	(0.97)	(0.21)	(0.94)	(0.16)	(0.79)	(0.18)	(0.67)	(0.06)	(0.38)

CONCLUSION

The panel data analysis shows that there is some consistency between the R-square measure and the classical measure; whereas the zero return measure captures a different aspect of stock market behaviour. It is found that trade openness, accountability and geographical size have a greater impact on the zero-return measure. In addition, there is evidence that synchronicity values can vary across countries depending on the approach used. For example, China and Malaysia exhibit higher stock synchronicity using the classical measure (China 73 per cent and Malaysia 73 per cent) and the R-square measure (China .241 and Malaysia .254), although these countries exhibit lower zero-return measures (China 11.5 per cent and Malaysia 26.5 per cent) relative to the mean (42.9 per cent).These results reinforce the possibility that the zero-return measure does capture a different aspect of stock market behaviour. Further analysis of this question is left to future research.

It is found that in general the classical measure and the R-square measure are positively correlated, whereas the zero-return measure is negatively correlated with both these measures, though this effect is not statistically significant for all sub-periods. There is some inconsistency across the three synchronicity measures in correlation analysis over sub-period and full period data. For example, the zero return measure is positively correlated with the classical measure in 1996-97 (the all-country group) and with the R-square measure in 2004-05 (the all-country group) using the Pearson correlation-coefficients, although this effect is not statistically significant. However, there is some evidence of similarities between the cross-sectional analysis results and both the Spearman rank and Pearson correlation results. Both Pearson correlation and Spearman rank correlation find that the classical synchronicity measure and the R-square measure are positively correlated, whereas the zero-return measure is erratically uncorrelated with the classical measure and the R-square measure.

Overall, the study finds that the R-square measure and the classical measure are positively correlated though there is some variation between the two measures. It is also found that the zero-return measure is not positively correlated with either the classical measure or the R-square measure. The possibility remains that the zero-return measure captures some aspect of broad equity market performance other than stock market synchronicity and this is borne out to some extent in the panel data analysis reported in table 4.

LIMITATIONS AND DIRECTION FOR FUTURE RESEARCH

This study uses stock return data from 41 countries over the period from January 1996 to December 2005 for analysis. Additional country data may provide more robust analysis of stock synchronicity. The study uses country level stock market data in synchronicity analysis; however, individual firm level synchronicity analysis would provide a valuable extension for further research.

The study uses seven explanatory variables for cross sectional analysis. Additional explanatory variables, such as anti-director right index and analyst forecast earning index could be useful for cross-country synchronicity analysis. While the study uses all available stocks from DataStream, it is possible that some listed stocks may have been omitted. Thus, a possible extension could involve analysis of more extensive datasets as they become available.

Finally, it is found that the classical measure and the R-square measure capture similar aspects of stock market behavior, whereas the zero-return measure appears to capture different aspects of stock market movements. It is assumed that emerging stock markets exhibit greater zero-return measures than developed financial markets, yet important examples such as China and Malaysia provide inconsistent results. Further analysis of this question is left to future research.

■Appendix

Table A1 ANOVA Test Statistics

Panel A:ANOVA test statistics for the classical measure

Developed vs. emerging country groups (equal variance estimate)

The data include two sets of countries, the emerging and the developed groups. Emerging countries include 34 sample countries and developed countries include seven sample developed nations.

	Sum of squares	Degrees of freedom	Mean square	F	Sig.
Between groups	.016	1	.016	13.002	.001
Within groups	.047	39	.001		
Total	.062	40			

Panel B: ANOVA test statistics for the R-square measure

	Sum of squares	Degrees of freedom	Mean square	F- statistics	Sig.
Between groups	.012	1	.012	3.492	.069
Within groups	.139	39	.004		
Total	.151	40			

Panel C: ANOVA test statistics for the zero-return measure

	Sum of squares	Degrees of freedom	Mean square	F-statistics	Sig.
Between groups	1682.091	1	1682.091	5.085	.030
Within groups	12901.253	39	330.801		
Total	14583.344	40			

Table A2 Sub-period synchronicity analysis using different measures

Sub period descriptive statistics data using the three synchronicity measures
(The classical measure, the R square measure and the zero return measure)

	Classical measure					R square measure					Zero return measure				
	1996-97	1998-99	2000-01	2002-03	2004-05	1996-97	1998-99	2000-01	2002-03	2004-05	1996-97	1998-99	2000-01	2002-03	2004-05
Argentina	0.72	0.72	0.68	0.66	0.69	0.25	0.24	0.13	0.10	0.18	45.2	54.9	65.5	66.0	61.5
Australia	0.59	0.57	0.58	0.57	0.58	0.02	0.03	0.02	0.03	0.02	43.2	46.7	47.2	51.9	49.3
Bangladesh	0.67	0.69	0.70	0.68	0.69	0.02	0.01	0.01	0.02	0.02	29.0	22.4	23.4	20.5	25.3
Brazil	0.61	0.65	0.64	0.65	0.65	0.08	0.09	0.09	0.09	0.10	56.8	61.3	63.0	69.0	65.1
Chile	0.63	0.67	0.64	0.64	0.65	0.12	0.13	0.11	0.09	0.08	38.3	47.3	51.5	54.0	49.1
China	0.74	0.72	0.72	0.75	0.74	0.39	0.31	0.25	0.32	0.20	4.8	5.6	7.7	10.4	13.3
Columbia	0.63	0.65	0.64	0.68	0.70	0.07	0.07	0.05	0.11	0.13	71.5	76.7	82.9	83.2	78.9
Cyprus	0.68	0.70	0.75	0.67	0.62	0.18	0.16	0.28	0.25	0.09	35.5	18.2	5.7	26.1	37.1
Czech Rep.	0.59	0.59	0.60	0.63	0.65	0.08	0.07	0.05	0.04	0.07	21.4	40.4	65.2	81.5	82.8
Ecuador	0.69	0.72	0.80	0.76	0.77	0.01	0.02	0.01	0.02	0.05	62.1	73.7	84.9	85.0	87.4
Egypt	0.65	0.67	0.65	0.64	0.67	0.19	0.15	0.11	0.08	0.08	20.7	21.7	29.1	32.7	26.5
France	0.60	0.61	0.61	0.63	0.61	0.09	0.09	0.12	0.13	0.11	18.8	19.6	21.1	25.7	21.7
Germany	0.59	0.59	0.60	0.60	0.59	0.02	0.02	0.01	0.01	0.02	30.1	28.9	28.7	36.8	40.0
Greece	0.69	0.72	0.78	0.75	0.65	0.04	0.02	0.02	0.03	0.01	8.4	11.4	11.0	13.3	14.5
Hong-Kong	0.64	0.67	0.65	0.64	0.63	0.03	0.03	0.02	0.02	0.02	23.1	30.5	37.2	46.0	43.7
Hungary	0.66	0.67	0.65	0.63	0.64	0.20	0.21	0.09	0.07	0.11	31.0	40.1	46.5	60.6	66.2
India	0.66	0.63	0.64	0.65	0.69	0.11	0.09	0.09	0.11	0.22	35.8	47.4	52.4	56.7	57.2
Indonesia	0.64	0.72	0.68	0.67	0.67	0.16	0.15	0.11	0.11	0.13	40.7	48.9	53.1	58.2	57.5
Japan	0.68	0.66	0.65	0.69	0.68	0.01	0.01	0.01	0.01	0.02	10.5	11.3	12.6	15.7	16.8
Kenya	0.62	0.59	0.59	0.64	0.64	0.02	0.01	0.02	0.03	0.03	40.1	45.7	51.5	50.2	42.4
Korea	0.69	0.68	0.69	0.68	0.63	0.15	0.18	0.18	0.19	0.10	19.9	21.6	20.2	26.9	31.6
Malaysia	0.73	0.79	0.75	0.71	0.66	0.38	0.45	0.32	0.19	0.11	12.4	22.7	30.2	33.2	35.0
Mexico	0.67	0.69	0.63	0.65	0.68	0.18	0.18	0.12	0.13	0.12	53.5	63.3	70.2	75.2	74.1

Sub-period synchronicity analysis using different measures (Continued)

Sub period descriptive statistics data using the three synchronicity measures
(The classical measure, the R square measure and the zero return measure)

	Classical measure					R square measure					Zero return measure				
	1996-97	1998-99	2000-01	2002-03	2004-05	1996-97	1998-99	2000-01	2002-03	2004-05	1996-97	1998-99	2000-01	2002-03	2004-05
New Zealand	0.63	0.63	0.61	0.60	0.62	0.13	0.12	0.12	0.08	0.08	25.7	24.0	23.2	28.8	26.6
Pakistan	0.68	0.65	0.65	0.67	0.67	0.13	0.09	0.11	0.12	0.13	53.0	65.3	55.8	48.2	49.6
Peru	0.62	0.63	0.65	0.69	0.68	0.07	0.08	0.03	0.02	0.05	57.5	69.5	74.7	78.7	77.4
Philippines	0.65	0.67	0.66	0.64	0.64	0.11	0.14	0.09	0.08	0.08	39.9	48.7	59.3	69.8	65.5
Poland	0.74	0.69	0.64	0.61	0.62	0.26	0.19	0.07	0.04	0.03	13.6	13.7	22.6	38.8	37.7
Portugal	0.63	0.64	0.62	0.63	0.62	0.14	0.14	0.11	0.10	0.11	32.4	31.1	31.9	38.8	36.7
Russia	0.67	0.73	0.68	0.69	0.70	0.19	0.10	0.08	0.07	0.11	49.7	73.0	67.0	67.4	64.8
S-Africa	0.61	0.61	0.60	0.59	0.61	0.07	0.10	0.07	0.04	0.07	32.7	40.7	62.6	73.8	71.0
Singapore	0.68	0.75	0.68	0.69	0.63	0.03	0.04	0.04	0.03	0.02	20.3	22.2	35.7	41.3	42.4
Spain	0.68	0.66	0.64	0.65	0.66	0.02	0.08	0.08	0.15	0.16	17.1	18.6	25.5	24.2	21.1
Sri-Lanka	0.65	0.66	0.66	0.69	0.68	0.09	0.10	0.19	0.16	0.15	61.5	59.7	65.7	54.1	44.5
Taiwan	0.69	0.71	0.72	0.69	0.66	0.23	0.23	0.25	0.22	0.16	10.6	11.1	15.2	20.8	24.2
Thailand	0.65	0.66	0.66	0.68	0.67	0.12	0.13	0.15	0.12	0.16	43.7	56.0	63.3	59.5	57.9
Turkey	0.75	0.75	0.76	0.75	0.71	0.26	0.32	0.37	0.28	0.18	15.5	18.9	29.5	36.5	31.3
UK	0.62	0.64	0.64	0.64	0.62	0.08	0.09	0.10	0.09	0.07	37.7	34.2	34.7	38.8	36.5
USA	0.64	0.63	0.61	0.64	0.65	0.07	0.10	0.05	0.03	0.02	30.9	27.0	25.8	24.6	30.4
Venezuela	0.74	0.72	0.63	0.65	0.63	0.27	0.23	0.05	0.05	0.07	25.8	40.4	65.4	80.8	79.7
Zimbabwe	0.66	0.64	0.65	0.68	0.69	0.16	0.10	0.08	0.21	0.24	26.9	37.7	51.7	47.2	55.6
Average	0.66	0.67	0.66	0.66	0.66	0.13	0.12	0.10	0.10	0.10	32.8	37.8	43.2	47.6	47.1

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High Dividend Rates Can Not Contribute to Long Investment Horizons: The Chinese Evidence

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ABSTRACT

This paper, based on Campbell (2000), introduces investor sentiment-related variables to a logarithm model, aiming to examine the relationship between dividend rate and investment horizons in the emerging Growth Enterprise Market of China. Using data sample of 243 IPO firms during 2009-2012, the study find that these firms' dividend policies do not contribute to investment horizons in the listing market, and both dividend rates and investment horizons vary across industry sectors. In addition, a majority of these firms failed to fulfill their dividend policies.
Keywords: Dividend Policies, Growth Enterprise Market of China, Investment Horizons

INTRODUCTION

Dividend policies are important because they affect investment decisions. Stock markets positively respond to announcements of dividend increase, but negatively to the announcements when dividend decreases (Michaely et al., 1995). The dividend announcements can convey information about current and future earnings to investors. Dividend increase typically implies a period of earnings growth (De Angelo et al., 1996; Benartzi et al., 1997). Higher earnings will lead to a positive stock-price increase. As Pettit (1972) documents, a significant price growth follows announcements of dividend increase, and vice versa.

Maintaining or increasing dividend rate in the light of growing earnings can be viewed as signaling good news to investors. As such, investors are more likely to invest for a long run to acquire more dividend premiums when the potential dividends are predictable. John and Williams (1985) model dividends as a signal of higher level for a firm's cash flows. Baker and Wurgler (2000) suggest further that constant dividend schemes signal optimistic cash productivity of listed firms, and this potential cash flow may stimulate investors' sentiment and demand for these firms' shares, they would like to increase their investment horizons.

The emerging Growth Enterprise Market of China (GEMC) launched in 2009 is designed for the Chinese fast-growing companies. The GEMC is a profit-preferred listing market, and this is well known for its high dividend rate relative to the Chinese primary share market. Meanwhile, the Chinese investors lack investment alternatives, and they would like to invest in these high dividend-based companies for a long run, when the dividend returns are higher than their incomes from bank interests. Therefore, I hypothesize that the dividend policies positively affect investment horizons in the GEMC.

This study tests this hypothesis and investigates that, to what extent, dividend rate influences investment horizon. Using a sample of 243 IPO firms during September 2009 to December 2012, I develop a logarithm model based on Campbell (2000) to test the hypothesis. The empirical results suggest that

i. The majority of listed firms on the GEMC failed to fulfill their dividend policies, apart from firms from Biomedicine industry.
ii. Both dividend rates and investment horizons vary across industry sectors in the GEMC.
iii. Unlike previous findings from US market, the dividend policies of firms in the GEMC appear to have less contribution to investment horizons. It is due to the fact that the shareholders are keen on trading frequently to cash shares when the share prices increase; they do not appreciate dividend premiums.

This paper contributes to existing literature in terms of new evidence and a unique analytical framework.

i. The GEMC as a new listing market has not yet draw attentions from academia, and it is a virgin but fertile area. Prior studies on dividend policies overwhelmingly focus on developed listing market particularly US market (Fama and French 2000). These studies are unlikely to account for the GEMC's issues.
ii. This paper initially introduces investment sentiment-related determinants to my theoretical framework, such as investment horizon, IPO volume (or fundraising amount), net profit, and dividend rate. Prior literature has extensively examined investment sentiment from initial-return perspective, but very little literature did from dividend policy perspective based on the Chinese share market. In addition, my paper employs a logarithm model to investigate sentiment, which is different from most studies using a principal-component method (Brown and Cliff, 2004; Baker and Wurgler, 2006). My study bridges the two gaps for existing literature.

The remainder of this paper is organized as follows: Section 2 presents an analytical framework.

Section 3 is data and empirical analysis. Section 4 outlines the results. Section 5 summarizes this study.

ANALYTICAL FRAMEWORK

■Dividend Rate

In practice, the dividend policies are not only a factor to measure a firm's capital structure, and asset pricing in most exchanges (Allen and Michaely, 2002), but also a considerable factor for investor protection in the Chinese stock market. In recent years, the Chinese listing authorities issued a series of policies on listed firms' dividend in cash that is considered as a vital avenue of return. Long (2014) suggests that the dividend rate is one of the most significant factors for successful IPOs in the GEMC.

The China Securities Regulatory Commission (CSRC) frequently emphasizes that the dividend in cash is very important for raising long-term investment concepts, and enhancing the market's attractiveness and vitality. The government implements a range of regulations to maintain the dividend policies. As the document 'Constitution Instructions for Listed Firms 2006' required, the firms must specify their dividend policies in cash, and maintain it sustainable and stable. The document 'No.3 Information Disclosure of The Firms Publicly Issuing Securities 2007' stipulates that the firms must publicly report their performance of dividend policies. The CSRC requires that all issuers must explicitly state their future annual dividend rate in their IPO prospectus. This rate varies across industries, but a minimum dividend rate is imposed to each IPO candidate by the CSRC. According to Term 5 of the document 'Administrative Regulations on Securities Issue of Listed Companies', the aggregate dividend rate (DR) in cash in the last three years must be over 30 percent of the average net profit (NP) over the period. Therefore, the dividend rate is an important indicator for the GEMC to assess an IPO firm.

$$DR = \frac{D_3+D_2+D_1}{NP_3+NP_2+NP_1} * 100\% > 30\% \quad (2\text{-}1)$$

Empirical evidence from the existing literature suggests that income from dividends is an important factor guiding the investment decision of public investors. Jain and Kini's (1999) evidence indicates that pre-IPO return performance of a firm can reflect its post-IPO survival rate. Particularly, firms with good return records are more likely to survive longer than others. Similarly, Loughran and Ritter (1995) consider the long-term return as a signal of an issuer's quality and find that low quality firms appear to have worse stock returns.

In addition, Campbell (2000) suggests that, in the absence of arbitrage, stock pricing is significantly subject to the discounting future dividends at a constant rate. Many studies document a positive relationship between dividend payouts and firm profitability (Fama and French, 2001; Baker and Wurgler, 2004). In particular, Firth (1998) find that the three-year dividend returns after listing are positively related to the issuers' profitability in the Singapore Exchange.

Furthermore, IPO companies signal their higher quality through outstanding dividend policies to attract informed institutional investors (Allen et al., 2000). The institutional investors consider the dividend payouts of IPO firms as the primary motivation to purchase their shares (Brav, et al. 2005). As such, the issuers might initiate their dividend distributions to satisfy the demand of their investors (Jain, et al., 2009). Hence, it is believed that dividend is an important indicator that the GEMC has to consider when assessing an issuer's quality.

From a theoretical perspective, we know that the dividend amount directly affects return rate, and indirectly influences IPO volume consequently. For a one-year short-term investment, the return rate of investment can be expressed as bellow:

$$r = \frac{D_1^p + (P_1 - P_0)}{P_0} \quad (2\text{-}2)$$

Where, r is the return rate; D_1^p stands for the dividend amount per share in the first year; P_1 means the price at the time of selling; P_0 means the price at the time of buying.

As equation 2-2 shows, there is a positive relation between dividend amount D_1^p and return rate r. For a long-term investment, the D_1^p increases within the investment period. As a result, the r will rise.

Dividend rate is a determinant of IPO pricing and affects the variable fundraising amount (FA). Campbell (2000) suggests that if there is a constant predictable return for an asset, and then its price is a linear function of its expected future payoffs. According to the author's random walk model of stock prices, if the return rate r is expected to be constant in the future, then equation 2-2 can be rewritten as

$$P_0 = E_t \sum_{t=1}^{T} \frac{D_t^p}{(1+r)^t} + \frac{P_t}{(1+Er)^t} \quad (2\text{-}3)$$

Where, E_t = Expected dividend in year t.

Theoretically, when the investment horizon becomes longer, namely, $t \to +\infty$, the second

component $\frac{P_t}{(1+Er)^t}$ approaches zero.

According to De long et al. (1990), investors are of two categories. One is rational traders, who are sentiment-free and value-based investors with long-run investment concept. On the contrary, irrational arbitrageurs are pretty sentimental and speculative traders who lead stock prices to drift away from their fundamental values (Kumar and Lee, 2006). For rational investors, temporary price fluctuations are not always at their fundamental values (Baker and Wurgler, 2007). That is to say that the short-run price changes of a stock are not able to truly reflect its value, and are not a determinant of investment decision for the value-based investors (or long-term investors), because 1) temporary deviations of a stock price incurred by the uninformed investors are eventually offset by the participation of the informed and value-based traders, who drive the prices back to their fundamental values (Ling, et al., 2010); and 2) the deviations is due to the fact that the sentimental investors trade quickly and frequently with current noisy information and drive the trading prices away from their intrinsic values (De Long et al., 1990). Therefore, the impact of the short-run fluctuation of stock prices on the second component $\frac{P_t}{(1+Er)^t}$ is less likely to affect the trading decision of value-based investors.

Alternatively, the P_t appears not to increase, decrease instead, because of the globally prevalent price underperformance in a long run (Goergen, et al. 2007; Bessler and Thies, 2007). Accordingly, this formula 2-3 is developed further as

$$P_0 = E_t \sum_{t=1}^{T} \frac{D_t^p}{(1+r)^t} \tag{2-4}$$

This model indicates that the share prices are fundamentally determined by their issuer's dividend policies. Thus, the right component of equation 2-4 is called the fundamental value of an asset price, although this expression exists only under the very special condition (Campbell, 2000). The return rate r will increase when dividend D_1^p grows considerably, which will lead to a proportional growth of the stock price eventually.

In addition, for the value-based investors, their benefits are mainly from the dividend income. Even for a short-term-preferred investor, the same result can be received in theory, because the price at which they sell is acceptable for the potential takers, who believe the expected high dividend income will attract the next investors to buy at a higher price. If not, the long-term dividend incomes are still satisfactory, so they are aware of investing for the long run when returns are predictable and profitable. Likewise, this long-term strategy may encourage the issuers to conduct a large amount of dividend to satisfy their long-term investors (Brav et al., 2005). Meanwhile, the investment sentiment (proxy as investment horizon t) exerts an influence on IPO price (De Long et al, 1990).

■ **Investment Horizon**

Based on the framework of sentiment and long-horizon returns proposed by Brown and Cliff (2005), who regard the investment horizon as a factor that accounts for sentiment fluctuations on a long-run basis, I proposes the future t-year dividend returns on sentiment:

$$f(S) = (D_{0+1}+D_{0+2}\ldots+D_{0+t}) / t = \alpha_t + \beta_t X_0 + \psi_t H_0 + \varepsilon \tag{2-5}$$

Where t is the investment horizon span; D_0 is an annual dividend in the buying year; a_t is an intercept within investment horizon t; X represents a vector of other factors that influence the stock returns within the period; β_t is the coefficient of X; H stands for a measure of investor sentiment, measured by investment horizon here; ψ_t is its coefficient; ε is the error term.

It indicates that, if the sentiment is measured by investment horizon, the investment horizon is expected to be high when the annual dividends are constant and growing in the future. Namely, investors are more likely to invest for a long run to acquire more dividend premiums when the potential dividends are predictable. According to Baker and Wurgler (2007), constant dividend schemes signal optimistic cash productivity of IPO firms, and these potential cash flows may stimulate investors' sentiment and demand to these firms' shares, they would like to increase their investment horizons. As equation 2-4 shows, dividend growths eventually lead to growths of stock prices. Therefore, Investment horizon contributes to IPO price and consequently affects fundraising amount.

The sentiment fluctuations may be measured by many indicators, such as aggregate trading volume (Baker and Stein, 2004), IPO returns (Baker and Wurgler, 2006), the dividend premium (Baker and Wurgler, 2004), Whereas, investment horizon is widely viewed as a stronger indicator of investor sentiment. I use investment horizon as the measure of the investor sentiment. The main reasons are:

i. From trading behavior perspective, investment for a long run is a cost-effective investment strategy in a non-hot market period. Although individual investors tend to trade their shares in a short time during a hot market period, because the investors investing in bubbly stocks many earn high returns through temporary price fluctuations in the short run (Greenwood and Nagel, 2009), this myopic strategy is profitable only for experienced traders who have a capability to predict the crash time point (Brunnermeier and Nagel, 2004).

ii. Financial advisers consistently suggest their investors to allocate a greater deal of share for a long run than short run, the risk of stocks drops with the investment horizon. Handling investment horizon can even be a profitable strategy in a long run for investors who have no the prediction capability (Jerzmanowski and Nabar, 2008; Hirshleifer et al., 2006).

iii. From IPO pricing perspective, IPO firms are valued on a long-term basis. An IPO pricing process mainly includes three stages: book building, offering, and aftermarket (Lowry and Schwert, 2004). An offering price is not in line with a firm's fundamentals, because IPO firms are valued by their underwriters and stock markets on the basis of their long-run growth potential. Since an efficient financial market is an information-effective trading platform where equities are properly valued by rational investors (Ling, et al, 2010), the risk-adjusted aftermarket price will gradually and appropriately reflect a share's intrinsic value. This long-run adjusted process varies depending on the financial market environment and issuer's performance in the future.

iv. This long-term investment concept appears to be feasible in guiding the IPO assessments in the GEMC, because a majority of exchanges (including China's exchanges[1]) typically employ this value-based investment concept to evaluate the IPO firms, and educate the investors to invest for the long run.

Therefore, the investor sentiment positively influences stock prices and consequently affects IPO volume.

■ Model Development

According to Campbell (2000) 'the market price of any financial asset is just the sum of its possible future payoffs, and the capital raised through IPO as part of financial assets is expected to be paid off by the issuers in the future' (pp.1516), the issuers must have the potential to produce sufficient cash flows for the payoffs in the future. The issuing firms annually allocate a proportion of dividend from their net profits to repay their shareholders in an expected investment horizon. In light of this assumption, an equation can be proposed as below:

$$\sum_{n=1}^{t} postNP_n * DR_n = FA \tag{2-6}$$

Where, $postNp_n$ means the future annual net profit in year t; DR_n means an expected annual dividend rate in year t after IPOs; FA stands for fundraising amount.

This equation demonstrates the higher current return rate and its future return expectation may contribute to a large amount of capital, and large firms typically pay out a significant percentage of their earnings in the form of cash dividends. This equation also exhibits the total net profit that applicants will have earned by the year t equals to their fundraising amount, which means the applicants have an expected cash flows to support the considerable returns to their investors.

According to Keasey and McGuinness (1991), profit records in the IPO prospectuses are more reliable for prediction of their future earnings than others, Based on prior net profit in the years before IPOs, the total expected net profit to be earned by the firm within the expected years t can be expressed as below:

$$\sum_{n=1}^{t} postNP_n = preNP * (1+EGR)^t \tag{2-7}$$

Here, $preNP$ means the average net profit of a firm in the last years before IPOs; EGR means the expected growth rate of net profit of a firm in year t; t means the investment horizon for a firm.

Substituting equation 2-7 with equation 2-6, I have

$$FA = preNP * (1+EGR)^t * DR \tag{2-8}$$

From this equation, we can see that the fundraising amount is a prospective value that an issuer will be able to create and repay to its investors within an expected investment horizon t, based on its current and future profitability and its expected growth rate in the period. This investment horizon is more likely to fluctuate significantly between hot and cold markets.

By taking logarithm, equation 2-8 can be rewritten as

$$lnFA = \theta_0 + \theta_1 ln\ preNP + \theta_2\ ln(1+EGR)\ t + \theta_3 lnDR \tag{2-9}$$

Where, θ_0 is a constant; θ_n is the coefficient of the variables.

According to model (2-9), the investment horizon can be defined as:

$$t = \frac{\frac{lnFA-\theta_0}{\theta_3 DR * \theta_1 preNP}}{\theta_2 \ln(1+EGR)} \qquad (t\ >1) \tag{2-10}$$

Because of the fluctuations of the investor sentiment, IPO markets have a sentiment cycle that swings between hot and cold markets (Ritter, 1984). A large volume of offerings, abnormal underpricing, and great oversubscription of shares basically feature a hot IPO market. On the other hand, a cold share market generally has much lower share issuance, less IPO underpricing, and less demand of new shares (Loughran and Ritter, 1995; Lowry and Schwert, 2002).

[1] The Chinese exchanges manage to perfect their dividend policies to built and promote a sound investment circumstance in the long term, so the authority guides and educates the investors to cultivate this kind of value-oriented investment awareness (see the official education website of SHSE at *edu.sse.com.cn*).

As my study is based on cross-section data, the horizons vary across industries, because fundraising amount is relatively subject to the industry-specific factors (Rajan and Servaes, 1997; Pagano et al., 1998), which exerts an influence on the investment horizon to a certain extent.

DATA AND EMPIRICAL ANALYSIS

■ Data

According to the listing procedures of China's stock market, IPO firms have to apply for their IPO permission from the CSRC, and they have to specify their IPO-specific information in their IPO prospectus. The CSRC publishes those documents on its official website (www. csrc.com) for public investor's reference. The data used for this study was collected from these IPO prospectuses of listing applicants. The CSRC reviewed 243 IPO applications from September 2009 to December 2012,

The panel data includes aspects of the industrial distribution, the net profits in the last three years before IPOs, the dividend (D) and dividend rate in the three years, the issued share amount, IPO price, and fundraising amount.

This study employs the Kolomogorov-Simirnov (K-S) One-sample Test to detect the distribution pattern of the population. As Table 3–1 indicates, the variables are from a normal distribution population at a significant level (p value < 0.05).

Table 3–1: One-Sample Kolmogorov-Smirnov Test

		NP_3	NP_2	NP_1	GR	D	FA
N		243	243	243	243	243	243
Normal Parameters[a]	Mean	3.01E7	3.80E7	5.53E7	.159	6.82E6	7.79E8
Most Extreme Differences	Absolute K	.189	.195	.191	.167	.132	.161
	Positive	.191	.195	.191	.188	.132	.161
	Negative	-.154	-.144	-.163	-.138	-.107	-.118
Kolmogorov-Smirnov Z		2.827	2.696	2.652	2.921	1.824	2.276
Asymp. Sig. (2-tailed)		.000	.000	.000	.001	.003	.000

a. Test distribution is Normal.

According to the testing principle of K-S, the K value for each variable indicates the variables have strong evidence of normal distribution. The K-S One-sample Test investigates a variable's distribution pattern to test its goodness of fitness with a particular distribution pattern. This test is based on the absolute difference between the sample and hypothesis, so the function is K=max $|\ T_i - S_i\ |$ .T_i is a value of hypothesis distribution in theory; S_i is a real value of a sample. If the K value is more likely to close to 0, the H_0 is accepted, and vice versa. This K is usually converted into a Z value in SPSS, $Z= \sqrt{N}*K$.

Therefore, the variable distribution pattern has a significant goodness of fitness with a normal distribution.

■ Empirical Analysis

I use the estimated logarithm model 2-9 to examine the effect of the proposed variables on FA. The following tables describe the results.

Table 3–2A describes the method of variable choice for this linear model is Enter, and no variables are removed from this model.

Table 3–2A: Variables Entered/Removed[b]

Model	Variables Entered	Variables Removed	Method
1	ln DR, ln(1+ EGR)t, ln $preNP$[a]	.	Enter

a. All requested variables entered; b. Dependent Variable: lnFA

Table 3–2B presents the goodness of fit between the linear model and collected sample data. The adjusted R^2 is 0.569, which means this linear model is able to describe the relations between these variables based on collected data.

Table 3–2B: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.764[a]	.583	.569	.3465

a. Predictors: (Constant), lnDR, ln(1+ EGR)t, ln $preNP$.

Table 3–2C illustrates the testing significance of variables. The high F value (41.263) and its significant P value (0.000) show an acceptable explanation on the linear relation between the dependent and independent variables. These independent variables are partially able to account for the dependent variable lnFA, because of the residual 14.169 is remaining, which can not be explained by the proposed variables.

Table 3–2C: ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	19.819	4	4.955	41.263	.000[a]
	Residual	14.169	118	.120		
	Total	33.988	122			

a. Predictors: (Constant), lnDR, ln(1+ EGR)t, ln $preNP$

b. Dependent Variable: ln FA

Table 3–2D: Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.652	1.108		6.002	.000
	ln $preNP$	.651	.094	.771	6.937	.000
	ln DR	.048	.024	.124	2.010	.047
	ln(1+ EGR)t	.332	.045	.483	7.358	.000

a. Dependent Variable: lnFA

The constant and coefficients for model 2-9 are given.

$$lnFA = 6.652 + 0.651ln\ preNP + 0.332\ ln(1 + EGR)\ t + 0.048lnDR$$

I put the collected data into model 2-1 and 2-10, and receive the results for the dividend rates and investment horizons as Table 3-3.

Table 3–3: Description of Values on Return Rates and Investment Sentiment by Industries

Industries[a]	DR	Inv. Horizons (t)
AM[b]	0.18	15.34
BI[c]	0.31	11.12
EF[d]	0.08	14.45
IT[e]	0.10	19.36
MA[f]	0.05	20.62
MS[g]	0.19	15.62
NM[h]	0.08	17.28
TM[i]	0.13	15.61
Average	0.20	19.78

a. The industries with fewer than 5 IPO firms are excluded. b. Advanced Manufacture,
c. Biomedicine, d. Environmentally Friendly, e. Information Technology,
f. Modern Agriculture. g. Modern Service. h. New Material
i. Traditional Manufacture.

As the table indicates, dividend rates vary across industries, and a majority of dividend rate is under 30 percent, which means these listed firms failed to fulfill their dividend policies. The BI as an emerging and promising industry in China has the highest return rate. In addition, the sectors with high returns are generally manufacture-related industries, while the agriculture-based sector MA has the least returns, due to the fact that China's economy is in the transitional process towards industrialization.

RESULTS

The empirical analysis demonstrates three new findings, which defer from those from prior studies based on developed stock markets.

Unlike previous findings from US market, the dividend policies of firms in the GEMC appear to have limited contribution to investment horizons. It is due to the fact that, the GEMC dominated by individual investors, when the share prices increase, these sentimental shareholders are keen on trading frequently to cash their shares, and they do not appreciate dividend premiums. Whereas, US exchanges are institutional-investor-dominated financial markets (Allen et al. 2000). The authors found that, as value-based investors, these institutional traders have more inside information about the companies in which they invest; they are unlikely to be affected by outside noise information. In order to maximize their investment return and reduce cost, these sentiment-free investors prefer long-term investment strategy for dividend premiums.

Firms' underperformances in dividend rate demonstrate that the majority of listed firms on the GEMC failed to fulfill their dividend policies, apart from firms from Biomedicine industry. This is due to the fact that these fast-growing firms in the GEMC withhold their profits for the future developments instead of repaying their investors. This finding defers from others. Brav et al. (2005) show US listed firms using competitive dividend policies signal higher quality and attract institutional investors. Allen et al. (2000) document a similar finding.

Both dividend rates and investment horizons vary across industry sectors in the GEMC. Theoretically, when increases in net profits and dividend rates lead to share-price increases, the arbitrageurs in the GEMC eager for cashing their shares. However, this theory can not entirely account for this finding. This indicates the investment horizons in the market are determined by other factors, saying dividend policies have limited contribution to the investment horizons.

CONCLUSION

This study explores the relationship between dividend policy and investment sentiment. Based on previous studies about the two factors, this study hypothesize that the dividend policies positively affect investment horizons in the GEMC. This hypothesis was empirically tested by a logarithm model and was rejected by the empirical results. The results suggest that, unlike in US share market, the dividend policies do not impact on the investment horizons in the GEMC, because of the different types of investors. This GEMC is dominated by sentimental individual investors, who prefer trading frequently to cash their shares regardless the dividend premiums, when the share prices increase.

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Bankruptcy Prediction of Indian Listed Companies Using Discriminant Analysis, Logistic Regression And Neural Network

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ABSTRACT

The purpose of this study is to develop reliable bankruptcy prediction models for Indian listed companies. Multivariate discriminant analysis, logistic regression and Neural Networks are employed to a dataset of 90 matched pairs of bankrupt and non-bankrupt Indian listed companies. The results indicate that the models yield an overall correct classification accuracy of 80 to 85% one year prior to bankruptcy. Neural Network has higher classification accuracy compared to discriminant analysis and logistic regression.

INTRODUCTION

One of the most significant threats for many businesses today, despite their size and the nature of their operations, is bankruptcy. Bankruptcy affects a firm's entire existence and it has a high cost to the firm, the society and the country's economy. The identification of bankruptcy and early warnings of impending financial distress are important for analysts and practitioners in all economies. There is a need for reliable empirical models that predict corporate failure promptly and accurately, in order to enable the interested parties to take either preventive or corrective action.

Vast and horrible effects of bankruptcy, has made it an important subject of research. The early researchers (Ramser and Foster, 1931; Fitzpatrick, 1932; Winakor and Smith, 1935; Merwin 1942) focused on the comparison of the values of financial ratios in bankrupt and non-bankrupt companies and concluded that the ratios of the bankrupt companies were poorer. The pioneering study of Beaver (1966) presented the univariate approach of the discriminant analysis which was expanded into a multivariate framework by Altman (1968). The discriminant analysis has been the primary method of failure prediction until 1980s during which the use of logistic regression method was emphasized. In recent years, neural networks have produced promising results in prediction of bankruptcy (Ugurlu and Aksoy, 2006)

The main objective of this study is to develop reliable bankruptcy prediction models for Indian listed companies. There is a wealth of research on bankruptcy prediction models using data from developed countries; much less research has been conducted using Indian data. Discriminant analysis, logistic regression method and neural networks are used to develop alternative prediction models and several financial ratios are tested in order to examine whether they have the potential to provide warning signals of bankruptcy. This study covers 90 companies that faced bankruptcy during the period 1989-2013 and their non-bankrupt mates of similar size from the same industry. The results indicate that neural network provides higher predictive accuracy than discriminant analysis and logistic regression method.

The remainder of this paper is organized as follows. Section 2 discusses some literature related to this study, section 3 discusses sample selection and statistical approach, Section4gives the empirical results, and Section5 provides a summary and conclusion.

LITERATURE REVIEW

There have been a fair number of previous studies in the field of predicting corporate failure; the more notable published contribution are Beaver (1966), Altman (1968), Deakin (1972), Blum (1974), Ohlson (1980) and Zmijewski (1984). Before Altman (1968), there are several studies devoted to the analysis of a firm's condition prior to bankruptcy. In almost every case, the methodology was essentially univariate in nature and emphasis was placed on individual signal of impending problems. However, ratio analysis presented in this fashion is susceptible to faulty interpretation and is potentially confusing (Lin 2009). As a result, Altman (1968) utilized the multiple discriminant analysis in the field of prediction of company financial distress. The author collects 33 bankrupt and 33non-bankrupt firms as the sample, matched by industry and size from 1946 to 1965. Finally, Altman (1968) constructs the discriminant function as follows: $z = 1.2*x_1 + 1.4*x_2 + 3.3*x_3 + 0.6*x_4 + 0.999*x_5$ where x_1 is working capital/total assets, x_2 retained earnings/total assets, x_3 earnings before interest and taxes/total assets, x_4 market value of equity/book value of total debt, x_5 sales/total assets and z overall Index. Altman (1968) uses 2.675 as the z value that discriminates best between the bankrupt and non-bankrupt companies. Companies will be classified as non-bankrupt if z score is greater than 2.675. If the z score is less than 2.675, then the companies will be classified as bankrupt.

In the 1980s, discriminant analysis became more and more replaced and supplemented by the logistic regression method, which turned out to be the most frequently used bankruptcy modeling and prediction method until the mid-1990s (Virag and Kristof 2005). Logistic regression method for the prediction of corporate insolvency on a representative sample was applied for the first time by Ohlson

(1980) for a sample of 105 insolvent and 2058 solvent companies. The author developed the model: O Score = -1.32 - 0.407*x_1 + 6.03*x_2 - 1.43*x_3 + 0.0757*x_4 - 1.72*x_5 - 2.37*x_6 - 1.83*x_7 + 0.285*x_8 - 0.521*x_9 where x_1 is In (total assets/ GNP price level index), x_2 total liabilities divided by total assets, x_3 working capital divided by total assets, $x_4$current liabilities divided by current assets, x_5 one if total liabilities exceeds total assets, zero otherwise, x_6 net income divided by total assets, x_7 funds provided by operations divided by total liabilities, x_8 one if net income was negative for the last two years, zero otherwise and x_9 $(NI_t - NI_{t-1})/(|NI_t|+|NI_{t-1}|)$, where NI_t is net income for the most recent period. The O Score obtained from the model can be transformed into a probability using the logistic transformation $p = \frac{1}{1+e^{-oscore}}$. In the model, the cutoff point which minimizes the errors is .038.Thus, probability values greater than 0.038 lead to a prediction of bankruptcy.

Discriminant analysis and logistic regression were popular methods for model development in the early stages of bankruptcy prediction. However, because of advancements and technology an alternative simulation approach, neural networks, has emerged in recent years (Charitou, Neophytou and Charalambous 2004).Neural networks were first used for bankruptcy prediction by Odom and Sharda (1990). The authors compared the performance of neural network with the results of discriminant analysis, using data of 74 companies based on Altman's (1968) five financial ratios. Odom and Sharda found that the neural network gave better results than discriminant analysis because it worked perfectly in case of companies used for training the network. The trained network was tested further on another 55 companies unknown to the network. Of the 27 bankrupt companies 5 (18.5%) were inaccurately classified among the non-bankrupt ones with the neural network method, while 11 (40.7%) companies were incorrectly classified with discriminant analysis.

Coats and Fant (1993) compared the results of discriminant analysis and neural networks. Classification accuracy of neural network was 95% while that of discriminant analysis was 87.9% one year prior to financial distress. Charitou, Neophytou and Charalambous (2004) developed bankruptcy prediction models for UK industrial firms using neural networks and logistic regression methods. The results indicate that the neural network model yielded an overall correct classification of 83% one year prior to bankruptcy.Virag and Kristof (2005) did a comparative study of bankruptcy prediction models on the date base of Hungarian companies. They concluded that bankruptcy models built using neural networks have higher classification accuracy than modelsbased on discriminant analysis and logistic regression. Wilson and Sharda (1994) also find that neural networks outperformed discriminant analysis in classification accuracy, especially in the prediction of bankrupt firms.

Thus recent empirical studies indicate that neural networks provide a more reliable bankruptcy prediction method than discriminant analysis and logistic regression analysis. Based on international experience a comparative study is necessary to see whether international trends prevail in Indian bankruptcy models as well.

METHODOLOGY

■Dataset

We have seen earlier that a large number of researchers have worked on the prediction of business bankruptcy. Bankruptcy can be defined in many ways, depending on the specific interest or condition of the firms under examination. In this study a company is defined as bankrupt if the company is delisted from the stock market and it meets the definition of sick company as per Sick Industrial Companies (Special Provisions) Act, 1985. As per Sick Industrial Companies (Special Provisions) Act, 1985 a sick company is one whose accumulated losses equal to or exceed its net worth, that is whose net worth has become negative. So the bankrupt firms in this study will be companies that were delisted from National Stock Exchange or Bombay Stock Exchange and whose net worth in the year prior to delisting is negative. Financial institutions are excluded from the dataset because they have special operating environment and are regulated by the special laws.

The data for this report is obtained from Prowess database of Center for Monitoring Indian Economy. In the Prowess database data of companies delisted from Bombay Stock Exchange or National Stock Exchange is available from 1989. So the period considered in this study is from 1989 to 2013. A total of 2,506 companies are delisted from Bombay Stock Exchange or National Stock Exchange during this period. After excluding financial institutions, merged companies, companies whose net worth prior to the year of delisting was positive and the companies with missing data, 90 bankrupt companies are left. In keeping with the methods of earlier researchers, for each bankrupt firm we randomly chose a 'twin' firm that did not bankrupt. The twin firm was chosen from the same industry group and approximately matched for asset size one year prior to bankruptcy. Thus the data sample consisted of 180 firms.

The most common procedure for developing a model is to develop it on one group and test it on a second group (Hair, Anderson, Tathamand Black, W. C. 1998). The final dataset was therefore split into two sub-samples, an analysis sample for estimation of the model and a holdout sample for validation purposes. The analysis sample contains 60 bankrupt and 60 non-bankrupt companies and the holdout sample contains 30 bankrupt and 30 non-bankrupt companies.

Data required for the bankrupt companies for the purpose of analysis has been taken from Prowess database one year prior to the year in which the company has become bankrupt. A company has been considered as becoming bankrupt in the year in which its net worth became negative. For e.g. if a company is delisted in the year 2002 and its net worth has become negative in the year 1995then the year 1995 has been considered as the year of bankruptcy and the data for the year 1994has been considered for the purpose of analysis. In case of non-bankrupt company data for the same year has been considered as is considered for its matched bankrupt company.

■ Selection of Independent Variables

Like previous researchers who have used financial accounting ratios in their empirical studies of bankruptcy prediction, this study also employs financial ratios for development of bankruptcy prediction models. In this study 26 financial ratios, proved to be successful in prior studies are employed. Ratio means were analysed to establish whether they were uniformly higher or lower for bankrupt and non-bankrupt firms. This analysis provides an understanding of the financial characteristics of both types of firms. An F-test was performed to assess the individual discriminating ability of the independent variables in the non-bankrupt and bankrupt samples. It tested the difference between the average values of the ratios in each group and the variability of these ratios. A profile of the sample ratio means is provided in Table 1 together with F-test statistics which shows difference between the means.

Table 1: Group means for the Independent Variables

No.	Ratio	Mean		Test of Equality of Group	
		Bankrupt	Non-Bankrupt	F	Sig,
1	market capitalisation /total liabilities	0.2680	3.2691	3.4420	0.0650
2	market capitalisation /total assets	0.1725	0.5374	25.719***	0.0000
3	market capitalisation /equity	1.4665	1.3391	0.1990	0.6560
4	total liability/equity	9.1838	1.5969	26.365***	0.0000
5	total liability/total assets	0.7340	0.5109	72.602***	0.0000
6	total assets/equity	10.8302	2.7402	27.107***	0.0000
7	fixed assets/(equity +long term liability)	0.6078	0.5002	7.851***	0.0060
8	retained earnings/total assets	-0.0826	0.1753	95.662***	0.0000
9	net income/total assets	-0.0895	0.0505	83.153***	0.0000
10	net income/equity	-1.2985	0.1212	27.785***	0.0000
11	net income/sales	-0.5257	0.0051	4.872**	0.0290
12	EBIT/sales	-0.1620	0.0771	7.37***	0.0070
13	EBIT/total assets	-0.0131	0.1104	68.356***	0.0000
14	working capital /sales	0.2377	0.3422	0.7980	0.3730
15	sales/ fixed assets	2.5134	6.2467	9.849***	0.0020
16	sales/total assets	0.7201	1.3051	31.173***	0.0000
17	sales/equity	6.8694	3.7572	7.276***	0.0080
18	sales/account receivables	7.4103	7.1205	0.0170	0.8950
19	current assets/sales	0.7010	0.5453	2.5350	0.1130
20	working capital/total assets	0.1698	0.2564	12.149***	0.0010
21	cash/total assets	0.0159	0.0411	9.461***	0.0020
22	current assets/current liabilities	2.4530	3.4088	4.419**	0.0370
23	current assets/total assets	0.3611	0.4716	14.884***	0.0000
24	current liabilities/equity	2.0563	0.6876	14.115***	0.0000
25	quick assets/current liabilities	1.3654	2.0937	3.967**	0.0480
26	quick assets/total assets	0.2032	0.2790	11.633***	0.0010

*** Significance at 1% ** Significance at 5%

The above table indicates that 18 variables have significant differences according to the F test for equality of means with significance at 1% and 3 additional variables are significant at 5%. Overall the results provide evidence that the financial ratios do have significant predictive abilities for detecting the bankruptcy potential of Indian Listed companies.

■ Discriminant Analysis

This study uses multiple discriminant analysis, logistic regression and neural network methodology to construct bankruptcy prediction model. Discriminant analysis is a statistical technique used to classify and/or make predictions in problems where the dependent variable appears in qualitative form, e.g., male or female, bankrupt or non-bankrupt. It represents the best way of classifying observations into one of several defined groupings - known as a priori groups - dependent upon the observation's individual characteristics. The data input for discriminant analysis in this study will be the financial statements of two groups of companies bankrupt and non-bankrupt and a list of 26 ratios which can be obtained from items in the financial statements. The task of discriminant analysis will be to search for that combination of variables which best depicts the difference between the financial characteristics of bankrupt and non-bankrupt companies. This combination will be referred to as a discriminant function. The efficiency of the discriminant function in distinguishing between bankrupt and non-bankrupt companies is tested by computing the discriminant score, referred to as z-score for each company, and examining the extent of overlap in the distribution of z-scores for the bankrupt group with the distribution of z-scores for the non-bankrupt group. If the overlap in the distribution is small, the discriminant function separates the

groups clearly. If the overlap is large, the function is a poor discriminator between the groups. The linear discriminant function is as follows:

$z = b_0+b_1*x_1+b_2*x_2+\ldots + b_n*x_n$

where

z =discriminant score

b_0=estimated constant

b_n= estimated coefficients

x_n= independent variables.

■ **Logistic Regression**

Logistic regression utilizes the coefficients of the independent variables to predict the probability of occurrence of a dichotomous dependent variable (Dielman 1996). In the context of bankruptcy prediction, the technique weighs the financial ratios and creates a score for each company in order to be classified as bankrupt or non-bankrupt. The function in logistic regression is called the logistic function and can be written as follows:

$p_i=1/ (1+e^{-zi})$

where

p_i= the probability the ith case experiences the event of interest

z_i= the value of the unobserved continuous variable for the ith case.

The model also assumes that z is linearly related to the predictors.

$z_i= b_0+b_1x_{i1}+b_2x_{i2}+...+b_px_{ip}$

where

x_{ij}= j^{th} predictor for the i^{th} case

b_j= the j^{th} coefficient

p = the number of predictor

■ **Neural Network**

Neural networks are the preferred tool for many predictive data mining applications because of their power, flexibility, and ease of use. Predictive neural networks are particularly useful in applications where the underlying process is complex, such as: forecasting consumer demand to streamline production and delivery costs or scoring an applicant to determine the risk of extending credit to the applicant.

The term neural network applies to a loosely related family of models, characterized by a large parameter space and flexible structure, descending from studies of brain functioning. As the family grew, most of the new models were designed for non biological applications, though much of the associated terminology reflects its origin. Neural network can approximate a wide range of statistical models without requiring to hypothesize in advance certain relationships between the dependent and independent variables. Instead, the form of the relationships is determined during the learning process. The trade-off for this flexibility is that the synaptic weights of a neural network are not easily interpretable. Thus, if one is trying to explain an underlying process that produces the relationships between the dependent and independent variables, it would be better to use a more traditional statistical model. However, if model interpretability is not important, one can often obtain good model results more quickly using a neural network.

The neural network is a function of predictors (also called inputs or independent variables) that minimize the prediction error of target variables (also called outputs). The neural network architecture consists of the following:

- The input layer containing the predictors.
- The hidden layer containing unobservable nodes, or units. The value of each hidden unit is some function of the predictors; the exact form of the function depends in part upon the network type and in part upon user-controllable specifications.
- The output layer containing the responses. Since the history of bankruptcy is a categorical variable with two categories, it is recoded as two indicator variables. Each output unit is some function of the hidden units. Again, the exact form of the function depends in part on the network type and in part on user-controllable specifications.

RESULTS

■ **Discriminant Analysis**

In this study a stepwise selection technique was employed to develop the discriminant analysis. The stepwise method, involves introducing the ratios into the discriminant function one at a time on the basis of their discriminating power. The bankruptcy prediction model is presented as below:

z=1.973-4.564*total liability/total assets+5.877*EBIT/total assets+0.835*sales/total assets-0.025*sales/accounts receivables

In this function the cut-off point is 0. The cut-off point indicates that firms with z score greater than 0 are predicted as non-bankrupt and firms with z score less than 0 are predicted as bankrupt. The Model performance is evaluated using Type I and Type II errors, as well as the overall accuracy rate. Type I errors occur when a model incorrectly classifies a bankrupt company as non-bankrupt,

while Type II errors occur when a model incorrectly classifies a non-bankrupt company as bankrupt. Overall accuracy is based on the total number of correct classifications. A classification matrix is calculated to assess the accuracy of the discriminant function (Table 2). From the holdout sample the number of firms correctly assigned to bankrupt group is 21, whereas 9 firms of bankrupt group were incorrectly assigned to non-bankrupt group. So the Type I error is 30%. The number of firms correctly assigned to non-bankrupt group is 27, whereas 3 firms of non-bankrupt group were incorrectly assigned to bankrupt group. So the Type II error is 10%. The overall accuracy ratio is 80%

Table 2: Classification Results – Discriminant Analysis

	Status	Predicted Group Membership		Total
		Non -Bankrupt	Bankrupt	
Count	Non-Bankrupt	27	3	30
	Bankrupt	9	21	30
%	Non-Bankrupt	90.00	10.00	100
	Bankrupt	30.00	70.00	100

■Logistic Regression

Stepwise logistic regression analysis is used to develop a model for predicting corporate bankruptcy. The bankruptcy prediction model is presented as below:

z=-4.313+11.345*total liability/total assets-16.022*EBIT/total assets–2.465*sales/total assets+0.060* sales/accounts receivables.

The cut-off value is 0.5. It means that the estimated probability is greater than 0.5 the company would be predicted as bankrupt. The classification matrix is presented in Table 3. The percentage of firms correctly classified is 81.67%. The Type I error is 26.67% and type II error is 10%

Table 3: Classification Table- Logistic Regression

	Observed	Predicted Group Membership		Total
		Non-Bankrupt	Bankrupt	
Count	Non-Bankrupt	27	3	30
	Bankrupt	8	22	30
%	Non-Bankrupt	90.00	10.00	100
	Bankrupt	26.67	73.33	100

■Neural Network

Table 4 presets the neural network classification matrix. The percentage of firms correctly classified is 85%. The Type I error is 16.67% and type II error is 13.33%

Table 4: Classification Table- Neural Network

	Observed	Predicted Group Membership		Total
		Non-Bankrupt	Bankrupt	
Count	Non-Bankrupt	26	4	30
	Bankrupt	5	25	30
%	Non-Bankrupt	86.67	13.33	100
	Bankrupt	16.67	83.33	100

■Comparison of Results

Table 5compares the validation results (overall classification accuracy, type I and type II error rates) of the three different methods developed in this study.

Table 5: Comparative validation results

	Discriminant Analysis	Logistic Regression	Neural Network
Overall accuracy	80%	81.67%	85%
Type I error	30%	26.67%	16.67%
Type II error	10%	10%	13.33%

As far as overall accuracy is concerned, results in Table 4 indicate that the neural network model provides the highest percentage accuracy, followed by Logistic regression and then by Discriminant Analysis. Moreover since the type I error is arguably more costly then type II error, researchers consider models to be superior if they minimize type I error rates. Table 5 shows that Neural Network yields the lowest type I error rates. In summary, comparing the validation results of the different failure prediction models developed in this study, we can conclude that the Neural Network model results are the most reliable for prediction bankruptcy of Indian listed companies.

CONCLUSION

The objective of this study was to develop bankruptcy prediction models for Indian listed companies using discriminant analysis, logistic regression and neural network. The data set employed in this study consisted of 90 matched pairs of bankrupt and non-bankrupt firms. The bankrupt companies had failed between the periods 1989 to 2013. It has been observed that all three models yielded high classification results, one year prior to bankruptcy. Neural Network achieved the highest overall classification accuracy, with an average classification rate of 85%. Logistic regression achieved an overall correct classification of 81.67% and discriminant analysis achieved an overall correct classification of 80%. If we take classification accuracy as decisive criterion, we can conclude that neural network perform better than discriminant analysis and logistic regression.

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The Compliance Cost of Anti-Money Laundering Legislation under Malaysia's Dual Financial System: A Survey of Bank Compliance Officers

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ABSTRACT

We develop our understanding of the regulatory cost burden on banks due to the *Anti-Money Laundering and Anti-Terrorism Financing Act 2001 (AMLATFA),* by surveying 82 compliance officers in Malaysia. The study assumes importance given the dual financial system (conventional and Islamic) enshrined in the *Malaysian Central Bank Act 2009.* The compliance officers envisage significant increase in cost in the next three years. The proportion of bank compliance officers expecting costs to rise between 21 to 50 per cent was 43 for conventional banks and 67 per cent for Islamic banks. The study contributes to the enforcement theory of regulation with evidence from Malaysia and would help inform policy about risk-based regulation.
Key words: Compliance cost, Malaysia, AML/CFT, dual financial system, Islamic banks
JEL: G21, G38, K42

INTRODUCTION

Following the recommendations of the Financial Action Task Force (FATF), legislations to deter and detect money laundering and the financing of terrorism, were introduced the world over. Malaysia too enacted the Anti-Money Laundering and Anti-terrorism Financing Act in 2001 (AMLATFA). In order to prevent money laundering and the financing of terrorism, the Act introduces a comprehensive set of obligations on the financial institutions. Banks occupy a dominant position among financial institutions in Malaysia and bear the brunt of the obligations imposed by the Act as is the case in other countries. The increased requirements with respect to know-your-customer, anti-money laundering and combatting financing of terrorism (AML/CFT) program, training and awareness raising, prescribed under the Act, it was feared, would impose substantial cost burden on the banks which they would ultimately pass on to the consumers. Overseas estimates show that banks incur enormous costs of compliance to similar legislation in their respective countries. For example, the British Bankers' Association estimated that "banks in Britain spend about 250 million pounds each year to comply with regulations . . . " (The Economist 2005). In the context of the US, Reuter and Truman (2004) estimated the compliance cost to be US$ 3 billion at 2003 prices. Sathye (2008) estimated the cost of compliance to the Australian banking industry as whole to about A$1.02 billion at 2007 prices.

The above estimates were, however, based either on econometric methods or using the method of analogy. Hardly any prior study to our knowledge, solicited the views of the bank compliance officers about compliance cost. This was not surprising since banks are rarely willing to disclose their internal cost information. However, the absence of such information also meant that the compliance cost burden on reporting entities and the reasonableness thereof vis-à-vis the objective of the AMLATFA was not known. Even the Financial System Inquiry Report (1997) in Australia lamented the difficulties in obtaining compliance cost estimates "[. . .] it is difficult to assess the national aggregates for compliance costs and compare such costs internationally due to differences in the measurement of compliance cost and different institutional compliance strategies".

The objective of our study is to develop our understanding of the compliance cost burden imposed on banks by Malaysia's Anti-Money Laundering and Anti-terrorism Financing Act in 2001 (AMLATFA 2001). The central question that we ask is as follows: What are the perceptions of bank officers in Malaysia' towards the cost of compliance to the AMLATFA? Malaysia follows a dual financial system, conventional and Islamic, which is unique in the world. Consequently, we are interested in knowing whether the perceptions of compliance officers working in the two different systems are similar or different. To gauge the perceptions of compliance officers we did a questionnaire survey of 82 AMLATFA compliance officers from both these systems and analysed the data obtained using the Friedman mean rank test.

We found that 67 per cent of compliance officers in Islamic banks consider that compliance costs would increase between 21 to 50 per cent while 14 per cent consider that these may increase over 50 per cent. The proportions for conventional banks were 43 per cent and 8 per cent respectively. Both the set of bankers ranked 'remittance' at the top, while ranking areas which would witness increased compliance

costs. The second rank was given to 'retail banking' by Islamic banks and to 'online banking' by conventional banks.

As the compliance costs would be ultimately borne by bank customers (that is, the society), we suggest that regulators may like to undertake regulatory impact analysis before further expanding the provisions of the Act to banks or to professionals such as accountants and lawyers. We also suggest that regulators may like to review existing provisions applicable to banks and consider how the compliance cost burden on them could be reduced. It is possible that excessive burden without corresponding benefits may lead to industry seeking financial assistance from the government for the 'policing' job outsourced to it by the government as contended by Harvey (2004). It may also lead to lack of seriousness in implementation. The APG (2007: 8), for example, stated 'there are some concerns that implementation by the financial institutions may not yet be in compliance with the legal requirements' as per the AMLATFA.

Against the above background, we hope to contribute to current academic literature on regulatory burden with evidence from Malaysia and further advance the enforcement theory of regulation. It may also help inform any regulatory changes proposed to the AMLATFA especially the extension thereof to designated non-financial businesses and professions. Such an extension would also lead to further regulatory cost burden on the Malaysian society.

The rest of the paper has been organised as follows: the next section presents a review of prior studies on cost of compliance, in particular, those relating to anti-money laundering and anti-terrorism financing. Section 3 presents the data and method used, section 4 presents results, and section 5 provides discussion and conclusion of this empirical study.

AN OVERVIEW OF BANKING SYSTEM IN MALAYSIA AND AMLATFA

'Malaysia is a federation of 13 states and three federal territories and is a constitutional monarchy with a common law system of law' (APG 2007:5). As stated at the website of Bank Negara Malaysia (BNM), there are 27 commercial banks (of which 8 are locally-owned and 19 are foreign-owned) and 16 Islamic banks (of which 10 are locally-owned and 6 are foreign-owned). As at the end of September 2012, the total assets of the local and foreign conventional banks were 85 per cent of the total banking assets of USD 6.67 trillion. The rest 15 per cent were held by Islamic banks. Top five conventional banks accounted for 69 per cent of the total assets of conventional banks.

The Anti-Money Laundering Act (Act 613) (AMLA) was passed in 2001 and came into force on 15 January 2002 to curb with crime related to money laundering offences in Malaysia. In 2003, the Act was revised and renamed as Anti-Money Laundering and Anti-Terrorism Financing Act 2001 (AMLATFA 2001) to include terrorism financing offences. It is a collaborative effort between central bank, that is, the BNM and several other relevant government and supervisory authorities. For the purpose of AML/CFT, the competent authority is the Financial Intelligence Unit (FIU) of BNM to which all reporting entities are required to send prescribed reports. The FIU receives suspicious transaction reports (STRs) and Cash Threshold Reports **(**CTRs), analyses and disseminates financial intelligence on such activities to the relevant law enforcement agency for investigation and subsequent prosecution. The three main law enforcement agencies involved in AMLATFA investigations are the Royal Malaysian Police, the Malaysian Anti-Corruption Commission and the Royal Customs Malaysia. These agencies have established dedicated AMLATFA units to give focus to money laundering and terrorism financing investigations and expedite overall enforcement actions. As at the end of 2011, there have been 121 money laundering cases at various stages of prosecution as per statistics obtained from the Royal Malaysian Police. As stated by the APG (2007:5) 'A number of terrorist organisations have been active on Malaysian territory, and authorities have taken concerted action against Jemaah Islamiah and its members and have identified and frozen terrorist assets held in the Malaysian financial system'.

Banks as the main reporting entities are at the forefront of the Government's efforts in preventing the banking system being used as a conduit for illicit money laundering and terrorism financing activities. The AMLATFA (2001) legislation imposes significant burden on banks in terms of its compliance costs. Banks have to put in place measures like (1) policies and procedures which outline clear accountability of employees (2) customer due diligence to ascertain identity of the ultimate beneficiary (3) sophisticated filtering and effective detection information technology system for reporting suspicious activities (4) provision of full and time disclosure of suspicious transactions to the relevant authorities (5) good record keeping (6) regular communication and training program to raise the employees' awareness.

Out of the total population of 43 banks, 26 banks are members of the Compliance Officers Networking Group (CONG) which is a group of compliance officers to share issues relating to AMLATFA.

REVIEW OF PRIOR STUDIES ON BANK REGULATORT COMPLIANCE COST

The present study is grounded in the enforcement theory of regulation. According to this theory, when society wishes to control businesses to pursue socially desirable objectives, four strategies are used: market discipline, private litigation, public enforcement through regulation, and state ownership (Djankov *et al.* 2003). These strategies are not mutually exclusive. As Shleifer (2005) states competition and regulation often operate in the same market, as do private litigation and public regulation. Money launderers have incentive to launder the proceeds of crime to make it legitimate and channelize it through financial system so that the detection of original source becomes difficult. When a bank becomes a conduit for transmission of such 'dirty money', its reputation and consequent public trust are at stake. Society can rely on such market discipline to check money laundering activities passing through the financial system.

Second, the society can rely on private litigation between parties. For example, where an issuer of a security cheats the investor, the latter may sue the former. In money laundering, however, a bank as a private party may feel that its function is financial intermediation on behalf of customers and it is not going to inquire into whether the proceeds passing through it were acquired through legal or illegal means. Consequently, the society may ultimately suffer as banks would actually be facilitating transmission of proceeds of crime. Third, the society may create a regulator who would mandate that regulated institutions should comply with the anti-money laundering legislation or face sanctions. Finally, the government may nationalise the banks and ensure that only legitimate transactions pass through the system. These are the four basic strategies of enforcement of good conduct (Shleifer 2005). Each of these four strategies has associated costs. From society's perspective, a strategy whose benefits outweigh costs would be desirable.

It has been recognised that to detect and deter money laundering and financing of terrorism an effective legislative regime is necessary (that is, strategy three above). An effective AML/CFT regime makes it harder for criminals to launder money and engage in terrorist activities. Consequently, governments the world over have enacted legislations in conformity with the requirements of the Paris-based FATF to create an environment hostile to money laundering and terrorism financing activities. However, regulation always involves a trade-off between effectiveness of the regulation and the cost thereof (Masciandaro 1998). Consequently, many countries such as the UK which initially introduced a tight anti-money laundering legislation subsequently made them risk-based. Australia also follows a risk-based system of AML/CFT legislation.

Regulated institutions tend to comply with the regulations as non-compliance has a cost associated with it in terms of sanctions from the regulator. For example, sanctions imposed by the regulator would result in reputational loss for the institution which in turn can result in loss of income (direct costs), client switching over to a different institution and possible legal costs (indirect costs) and foregone business opportunity (opportunity costs) as stated by Harvey (2004). AML/CFT legislation is one of the regulations out of a suite of regulations –prudential or otherwise – that impact compliance cost of banks. Elliehausen (1998) provided a comprehensive review of literature on the cost of bank regulation. As stated by this researcher, banks are unable or unwilling to make available separately the cost data on bank regulation cost and consequently researchers have relied up on four methods to estimate the compliance cost.

These include case study (for example, Darnell 1980; McKinsey & Company 1992; and Grant Thornton 1992), econometric methods (for example, Benston 1975), surveys (for example, Grant Thornton 1993; Barefoot *et al.* 1993) and through analogy (Smith 1977; Baer 1988 and Hannan 1988, 1989).

The above studies have been about bank regulation cost in general. Studies that have specifically tried to assess the regulatory cost burden of anti-money laundering and counter-terrorism financing (AMLCTF) legislation on banks have been few. Estimating the cost of compliance of this legislation is particularly hard. 'The difficulty of estimating AML costs is that cost may be spread across many different functions (operations, compliance, risk) or regions, involve direct and indirect costs, and overlap with processes that are embedded in normal business practice (e.g. credit risk or customer relationship management)' (KPMG 2007). Reuter and Truman (2004) classify the cost of the anti-money laundering and anti-terrorism financing regime in to three categories: costs incurred by the government or public sector in establishing and administering the regime, costs incurred by the private sector in carrying out the requirements of government; and costs borne by the general public.

Gill and Taylor (2004) studied the perspectives of financial companies on know-your-customer (KYC) procedures in UK. KYC guidelines were found to have negative implications for existing customers and the lack of flexibility in rules was found to complicate matters further. The requirements were found to be disproportionate to the risk and did not take into account the expenses of these companies in implementing the rules.

Harvey (2004) studied the cost and benefits associated with compliance to AML/CFT legislation in financial institutions in UK by interviewing bank officers. The compliance cost was considered to be a

necessary cost by the financial institutions. Avoidance of sanctions was found to be the prime reason for compliance with the legislation but reputational risk was not considered to be a significant issue as was generally thought.

Webb (2004) did personal interviews of 30 AMLCTF compliance officers in London city banks. More than 60 per cent of the compliance officers were of the view that the legislation was not effective in controlling money laundering. While they supported the intent of the legislation they found it impractical to implement. The compliance officers in small banks were of the view that the benefits of the legislation for small banks were lower than the cost of implementing.

Z/Yen (2005) did a comparative study of perceived costs and benefits of UK Anti-Money Laundering Requirements (AMLR) with other jurisdictions including the USA, Germany, France and Italy. The focus of the study was not on banks and respondents included police officers, professional accountants, partners, directors of companies and some money laundering compliance officers. The study found, among others, that most respondents considered the regulations to be too severe given the risk of money laundering, main reason why reporting entities complied was the fear of sanctions, and regulation did not have a pronounced impact on competitiveness of UK.

KPMG Global Anti-Money Laundering Survey (2007) found significant rise in AMLCTF compliance costs the world over. While the estimate for Malaysia, in particular, was not available during 2004-2007, the cost increased by 37 per cent in the Asia Pacific Region. 'The drivers of higher expenditure appear to be greater expenditure on transaction monitoring capabilities and upgrades to existing systems, and the provision of additional tailored training to staff' (KPMG, 2007:16).

Favarel-Garrigues *et al.* (2008) studied the bank compliance officers in US, UK and France and found that large sums of money have been invested for recruitment and training of personnel and for software solutions. Banks compliance officers found that increasingly the function of policing is being transferred to them and that avoiding of penalties and the ensuing reputational damage is the prime reason why banks comply with the elaborate AML/CFT regulations.

Sathye (2008) used the method of analogy to estimate the compliance cost of banks for AML/CFT financing legislation in Australia. Given the difficulties in estimating compliance cost and the given that the resultant estimates are by far only ballpark estimates, in the present study we focussed instead on soliciting perceptions of bank compliance officers whether they expect that the costs would remain the same as experienced by them in the last three years or would they increase.

Verhage (2009) did a web-based survey of 74 compliance officers of banks in Belgium to understand what role is played by these officers in the anti-money laundering context, that is, whether they are trapped in commercial decisions on one hand and compliance to law on the other and found that they are so trapped. The compliance officer reported that their major goal was to prevent reputational damage to the bank. The study did not specifically seek their views about compliance costs.

Interestingly, few studies have examined the anti-money laundering legislation in Malaysia. Shanmugam, Nair and Suganthi (2003) highlight the growth of money laundering activities in Malaysia and pointed out several loopholes in the *Anti-Money Laundering Act 2001*. Shanmugam, B. (2004), studied hawala remittance mechanism and identified the reasons why hawala thrived.

Shanmugam and Thanasegaran (2008) examined the current money laundering trends in Malaysia and the initiatives taken by the Malaysian authorities to curb such activities. Mohamed and Ahmad (2012) examine money laundering cases investigated by the Central Bank of Malaysia under the AMLATFA 2001. This study analyzes the contents of public releases by the enforcement division of the Central Bank for period 2007 to 2011. Only Rahman (2008) examined the impact of the revised legislation, the AMLATFA, on the banking sector. The focus was on legal aspects. Thus, none of the studies on money laundering in Malaysia have examined the impact on compliance cost of banks which our study does by questionnaire survey of AML/CFT compliance officers.

The current study is important for several reasons. First, as can be seen from the above review, the focus of these studies was on developed countries of Europe and North America and in particular the UK. Interestingly, none of the studies was focussed on the issues confronted by middle-income countries like Malaysia which is one of the prominent members of the Association of South East Asian Nations (ASEAN). The country also houses the Labuan International Offshore Financial Centre which naturally entails special risks from money laundering perspective. More importantly, Malaysia is also a member of the Asia Pacific Group of Anti Money Laundering (APG). A report by the US Department of State considers Malaysia as a country of concern from money laundering perspective as it may be used as a transit point for money launderers.

Malaysia's long porous land and sea borders and its strategic geographic position increase its vulnerability to transnational criminal activity, including money laundering and terrorist financing. Malaysia is primarily used as a transit country to transfer drugs originating from the Golden Triangle and Europe; and Iranian and Nigerian drug trafficking organizations are the main sources of illegal proceeds in Malaysia. Drug trafficking is the main source of illegal proceeds in Malaysia (USDS 2012).

Second, it is a country that has a diverse banking structure where Islamic banks are equally prominent as conventional banks. Islamic banking differs in many respects with conventional banking and as such poses special problems from AML/CFT perspective. The *Banking and Financial Institutions Act 1989 (BAFIA*) is applicable only to non-Islamic banks while, Islamic banks are governed by a separate legislation the *Islamic Banking Act 1983 (IBA*). Further, the banking products of Islamic banks need to be Sharia compliant. The *Central Bank Act 2009* specifically recognises dual financial system consisting of conventional financial system and Islamic financial system. Further, the Labuan Financial Centre is governed by another separate legislation, that is, the Offshore Banking Act 1990. The AMLATFA is, however, applicable to all these institutions. It will be interesting to examine how the compliance officers working in such a diverse banking system react to the AMLATFA regulatory burden especially when the APG (2007) mid-term evaluation report on Malaysia stated that 'the effectiveness of implementation of the AML/CFT compliance monitoring and supervision has varied across the financial sector'. Consequently, if the compliance cost burden is perceived differently by officers working under the dual financial system then it would be interesting to know whether it is due to not fully implementing the regime effectively or due to efficient operation. These inputs would provide leads to the BNM to accordingly prioritise its monitoring and supervision of AMLATFA. Third, we did not come across any study that has specifically looked at the perceptions of Malaysian bank compliance officers. As already stated, none of the Malaysian studies have examined the impact on compliance cost which is the focus of our study.

Finally, as stated by Levi and Reuter (2006:289) 'Money-laundering controls impose costly obligations on businesses and society: they merit better analysis of their effects…'. By subjecting the Malaysian banking system which is diverse and surveying the compliance officers of banks that are governed by different banking legislations, we significantly contribute to the existing literature and provide a perspective hitherto unknown in the literature.

The focus of the present study is on compliance cost to banks (private costs) rather than on the costs incurred by the government and by consumers in complying with the AMLATFA regulation in Malaysia. The question that we examine is: Is there a difference between the perceptions of bank compliance officers on the compliance cost of AMLATFA in the dual financial system of Malaysia? The finding would help us understand which of the two systems is more cost effective.

The data and method used to answer the question are described below.

DATA AND METHOD

The data required to answer the central question of this study was obtained by surveying the bank compliance officers. We followed the below procedure.

Questionnaire design and ethics clearance: We started with the questionnaire used in the Z/Yen (2005) UK study which is already tested and is publicly available as a guide and modified it keeping in view the banking institutions in Malaysia and the AML/CFT legislation in that country. It was then pilot tested with a few compliance officers working in banks. We also sought the opinion about the questionnaire from the CONG. We were, in particular, interested in knowing if they had any difficulties in completing the questionnaire. Based on the feedback received, the questionnaire was further amended. We also obtained the required ethical clearance from the Universiti Teknologi MARA.

The questionnaire contained a total of 29 questions divided in four sections relating to benefits of the AMLATFA regime, cost of compliance, their perception about effectiveness of the regime and the respondents profile. In this paper, we focus on the responses received on the questions relating to compliance cost and the profile of respondents. These involved 10 questions in total.

Selection of sample: As already stated above, Malaysia has 27 commercial banks (eight locally-owned) and 16 Islamic banks (10 locally-owned and six foreign-owned). The questionnaire was distributed to all banks during September to December 2012. Of the 26 banks, 89 compliance officers from 15 banks responded. Though a bank may have only one principal compliance officer, there would be several AMLATFA compliance officers working in the department. Of these, seven responses were not usable for various reasons. We analysed the remaining 82 respondents, of which, nine were principal compliance officers. The data was analysed using SPSS and statistical significance tests were conducted.

RESULTS AND DISCUSSION

The findings of the study are presented below:

■ Profile of respondents

Table 1: Profile of AMLATFA compliance officers

Panel A: Types of banks

	Frequency	Per cent
Conventional Banks: Local	53	64.6
Conventional Banks: Foreign	7	8.5
Islamic Banks: Local	13	15.9
Islamic Bank: Foreign	9	11.0
Total	82	100.0

Panel B: Bank size

	Frequency	Per cent
Big 5 banks	44	55.7
Between rank 6 to rank 10	1	1.3
Ranked lower than 10	34	43.0
Total	79	100.0

Panel C: Monthly salary

	Frequency	Per cent
Less than RM5,000 (3.1090 MYR/USD)	27	37.0
Between RM5,001 and RM10,000	29	39.7
Between RM10,001 and RM15,000	12	16.4
More than RM15,000	5	6.8
Total	73	100.0

As can be seen from the above, despite carrying enormous load of meticulously observing the regulation in order to avoid sanctions on their respective institutions, a large proportion of compliance officers (93 per cent) were drawing less that USD 4,825 (RM 15,000) per month. Further, significant proportions of respondents were from local conventional banks and from the Big Five Malaysian banks.

We asked the compliance officers to indicate their perception of the trend in compliance cost in the last three years and expected cost in the next three years. As can be seen the proportion bank compliance officers expecting a rise between 21 to 50 per cent was 67 per cent for Islamic banks while it was only 43 per cent for conventional banks. 14 per cent of the Islamic bank officers consider the costs to rise beyond 50 per cent while only 8 per cent of the conventional bank officers consider accordingly. The larger proportion of Islamic bank officers considering costs to rise could be attributed to the requirement that the products of these banks must be Sharia compliant. It naturally imposed additional costs on these institutions.

Table 2: Perceptions about compliance costs trend

	Conventional Banks				Islamic Banks			
	Past 3 years		Next 3 years		Past 3 years		Next 3 years	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Decreased	-	-	2	3.9	-	-	-	-
Remained Constant	3	5.7	2	3.9	-	-	1	4.8
Increased by < 20%	27	50.9	21	41.2	6	28.6	3	14.3
Increased between 21% to 50%	13	24.5	22	43.1	8	38.1	14	66.7
Increased > 50%	10	18.9	4	7.8	7	33.3	3	14.3
	53	100.0	51	100.0	21	100.0	21	100.0

Our results are consistent with the KPMG (2007) global study of compliance costs which found that as against estimated increase of 43 per cent during the period 2004-2007, the actual increase was 58 per cent.

Next we obtained the views of the compliance officers about the burden of AMLATFA compliance cost by business sectors and compared whether they expect the future burden to increase vis-à-vis the current burden. We compared the burden using the paired sample *t* test. The results were as follows:

Table 3: Mean of compliance cost of implementing AMLATFA requirements for different business sectors (1 =very low, 5=very high)

Panel A: Conventional Banks

	N	Current	Expected	Gap	t-value	*p-value*
Retail/Personal Banking	56	3.5536	4.1429	0.5893	7.396***	0.000
Wholesale/Commercial Banking	54	3.3333	3.8519	0.5185	5.495***	0.000
Investment Banking	53	3.2830	3.9811	0.6981	6.564***	0.000
Private Banking	53	3.2453	4.0189	0.7736	7.775***	0.000
Online Banking	54	3.1852	4.0370	0.8519	8.210***	0.000
Credit Cards	54	3.3333	3.8889	0.5556	6.759***	0.000
Remittance	55	3.4545	4.1455	0.6909	8.074***	0.000

Panel B: Islamic Banks						
	N	**Current**	**Expected**	**Gap**	**t-value**	***p-value***
Retail/Personal Banking	22	3.5000	4.2273	0.7273	4.446***	0.000
Wholesale/Commercial Banking	21	3.0952	3.8571	0.7619	4.202***	0.000
Investment Banking	20	3.0500	3.9000	0.8500	3.655**	0.002
Private Banking	19	2.8421	3.9474	1.1053	5.504***	0.000
Online Banking	22	3.3636	4.1818	0.8182	5.238***	0.000
Credit Cards	22	2.9091	3.6818	0.7727	4.822***	0.000
Remittance	22	3.5455	4.3182	0.7727	4.822***	0.000

*Note:***p < 0.001(0.1%),**p<0.01(1%),*

Table 4: Friedman test on mean of compliance cost of implementing AMLATFA requirements for different business sectors (1 =very low, 5=very high)

	Mean Rank			
	Current		**Expected**	
	Conv.	**Islamic**	**Conv.**	**Islamic**
Retail/Personal Banking	4.45(1)	4.81(1)	4.20(3)	4.47(2)
Wholesale/Commercial Banking	3.94(4)	3.69(5)	3.42(7)	3.64(5)
Investment Banking	3.79(5)	3.53(6)	3.95(5)	3.61(6)
Private Banking	3.74(6)	3.33(7)	4.08(4)	3.78(4)
Online Banking	3.70(7)	4.25(3)	4.26(2)	4.17(3)
Credit Cards	4.03(3)	3.72(4)	3.72(6)	3.61(6)
Remittance	4.35(2)	4.67(2)	4.38(1)	4.72(1)
N	52	18	53	18
Chi-Square	12.786	14.936	22.176	11.726
df	6	6	6	6
Asymp. Sig.	0.047	0.021	0.001	0.068

As can be seen the rankings of the business sectors that would experience cost rise are different in Islamic and conventional banks. While both Islamic and conventional banks rank remittance as the top business sector which would experience cost rise, the second rank is given to retail banking by Islamic banks but to online banking by conventional banks and vice versa for the third rank. The rankings would help bank managements to focus strategically on these areas to reduce their compliance costs by examining the processes that can be done away with without diluting the AMLATFA requirements. Even regulators may like to take a close look at the requirements imposed on banks in these areas to consider whether these unnecessarily impose heavy cost burden on banks and indirectly on their customers/society. In the context of UK, the Z/Yen (2005) study ranked the sub-sectors as retail banking, investment banking and wholesale banking. The difference in ranking of the sub-sectors could be attributed to the profile of banks business in Malaysia as compared to the UK.

We decided to break the compliance cost in two categories initial (start-up) cost and the on-going (operating) cost to gauge the impact of AMLATFA legislation on these costs disparately. Our objective was to find which of these two major classes of compliance costs are expected to rise compared to the current burden.

Table 5: Friedman test on mean of the AML/CFT -related initial (start-up) costs (1 =very low, 5=very high)

	Mean Rank			
	Current		**Expected**	
	Conv.	**Islamic**	**Conv.**	**Islamic**
Identify and verify identity of customers	5.69(8)	6.38(6)	5.92(6)	5.81(7)
Monitoring customer transactions	6.76(3)	7.29(2)	7.09(2)	7.14(1)
Considering suspicious transactions	5.80(7)	5.62(9)	6.11(5)	5.57(9)
Preparing and submitting reports	5.45(9)	6.14(7)	5.69(9)	6.60(5)
Record, storage, and data retrieval	5.95(5)	5.64(8)	5.71(8)	6.81(4)
Staff training	6.48(4)	6.43(5)	6.99(4)	6.95(3)
Setting up AML/CFT reporting unit	7.04(2)	7.07(3)	7.13(1)	5.83(6)
Setting up AML/CFT system	7.20(1)	7.40(1)	6.58(3)	6.98(2)
Setting up policies and procedures	5.90(6)	6.76(4)	5.78(7)	5.62(8)
Consultancy fees	4.86(10)	3.69(10)	4.41(11)	4.00(11)
Equipment repairs and maintenance	4.86(10)	3.57(11)	4.59(10)	4.69(10)
N	54	21	53	21
Chi-Square	50.094	57.689	73.467	40.293
df	10	10	10	10
Asymp. Sig.	0.000	0.000	0.000	0.000

Again, the rankings given by Islamic and conventional banks for start-up costs are in variance. While Islamic banks rank monitoring customer transactions costs at the top, for conventional banks it is the setting up of AML/CFT reporting unit. Similarly, the second and third rank is given to costs relating to setting up policies and procedures and staff training by Islamic banks while conventional banks give these ranks to monitoring customer transactions and setting up AML/CFT system respectively.

The ranking given by the bank compliance officers in Malaysia is consistent with the ranking for these activities received in the KPMG's Global Anti–Money Laundering Survey (2007). The survey also identifies monitoring customer transactions and staff training as the two top ranking items of start-up expenses.

Table 6: Friedman test on mean of the AML/CFT-related annual (on-going) costs (1 =very low, 5=very high)

	Mean Rank			
	Current		Expected	
	Conv.	Islamic	Conv.	Islamic
Review and updating customer information	5.51(5)	5.66	5.97(5)	6.16(2)
Monitoring and updating customer transactions	5.95(3)	5.70	6.32(2)	5.80(6)
Considering suspicious transactions	5.35(6)	4.80	4.99(7)	4.36(10)
Preparing and submitting reports	4.76(10)	5.43	4.57(10)	4.84(8)
Record, storage and data retrieval	5.15(7)	5.27	5.10(6)	5.89(5)
Staff training	5.95(3)	5.59	6.10(4)	5.91(3)
Maintaining AML/CFT reporting unit	6.37(1)	6.36	6.24(3)	5.91(3)
Reviewing and updating of the AML/CFT system	5.98(2)	5.59	6.37(1)	6.50(1)
Updating policies and procedures	5.15(7)	5.68	4.75(8)	4.70(9)
Equipment repairs and maintenance	4.82(9)	4.91	4.58(9)	4.93(7)
N	53	22	55	22
Chi-Square	29.627	12.498	60.144	28.939
df	9	9	9	9
Asymp. Sig.	0.001	0.187	0.000	0.001

Review and updating AML/CFT system constitute the top ranking items of the costs that make up the on-going costs for both the types of banks. The second rank is, however, taken by review and updating customer information in Islamic banks while it is monitoring and updating customer transactions in conventional banks. In Islamic banks, maintaining AML/CFT reporting unit and staff training costs both occupy the third rank while in conventional banks it is only the maintaining AML/CFT reporting units. Islamic banks may like to consider why their staff training costs are likely to rise as compared to conventional banks and may like to adopt the training strategies of conventional banks or consider providing online training to reduce these costs.

Next we asked the respondents to indicate how the costs of the AML/CFT compliance division were distributed among various items of expenses. It was found that over 57 per cent of the cost in conventional banks was consumed by three items, that is, purchase of software, training cost and purchase of hardware while in Islamic banks the top three items consuming compliance costs were training cost, purchase of software and additional human resources required.

Table 7: Mean percentage of cost allocation in AML/CFT compliance division

Panel A: Conventional Banks

	N	Mean	Std. Deviation	Minimum	Maximum
Purchase of Hardware	51	19.67	14.37	3.30	70.00
Purchase of Software	51	21.18	11.78	0.00	60.00
Cost of training for AML/CFT	51	16.14	10.32	3.30	50.00
Maintenance	51	9.28	4.94	0.00	20.00
Human Capital Development (e.g. Creation of new posts related to AML/CFT)	51	15.20	11.36	0.00	55.00
Punitive Cost (e.g. Compound for non-compliance)	51	7.55	7.64	0.00	40.00
Creation of a new department (to manage AML/CFT)	51	10.98	7.48	0.00	30.00
		100.00			

Panel B: Islamic Banks

	N	Mean	Std. Deviation	Minimum	Maximum
Purchase of Hardware	20	11.25	7.93	0.00	30.00
Purchase of Software	20	21.25	12.86	5.00	50.00
Cost of training for AML/CFT	20	22.75	15.34	10.00	70.00
Maintenance	20	14.60	12.96	0.00	55.00
Human Capital Development (e.g. Creation of new posts related to AML/CFT)	20	15.00	9.87	0.00	30.00
Punitive Cost (e.g. Compound for non-compliance)	20	4.65	5.51	0.00	20.00
Creation of a new department (to manage AML/CFT)	20	10.50	9.58	0.00	30.00
		100.00			

The above table would help banks determine what they would need to do in their respective institutions to curtail costs of compliance. While some of the costs like purchase of hardware and software may be unavoidable, training costs could be reduced by providing training online. Similarly, punitive costs (cost of sanctions) could also be reduced by appropriate vigilance on timely compliance.

Finally, we asked the compliance officers to indicate what they consider to be the major consequences of non-compliance to the regulation. We received the following responses:

Table 8: Friedman test on mean of cost of consequences of non-compliance with AML/CFT requirements

	Mean Rank			
	Current		Expected	
	Conv.	Islamic	Conv.	Islamic
Loss of existing customers	2.94(6)	2.93(6)	3.32(5)	2.95(6)
Loss of potential customers	3.34(4)	3.07(5)	3.40(3)	3.02(5)
Fine imposed by Malaysian regulators	3.93(1)	3.95(1)	3.96(1)	4.02(1)
Other sanctions (eg ban by foreign countries especially the US to do banking business)	3.63(3)	3.93(2)	3.33(4)	3.91(2)
Reducing public's confidence	3.29(5)	3.55(4)	3.17(6)	3.39(4)
Financial loss suffered (eg due to freezing of assets)	3.88(2)	3.57(3)	3.82(2)	3.70(3)
N	55	22	55	22
Chi-Square	21.436	9.713	15.208	15.783
df	5	5	5	5
Asymp. Sig.	0.001	0.084	0.010	0.007

As can be seen from the above table, the fines imposed by regulators, other sanctions, and financial loss suffered are the top three items ranked by bank compliance officers in Islamic banks surveyed by us. Conventional banks, however, consider, the fines imposed by regulators, financial loss suffered and loss of potential customers as the top three items. These results are similar to the Z/Yen (2005) study of UK banks.

CONCLUSION

The issue of regulatory burden on banking institutions has engaged the attention of researcher and industry alike all over the world. Tighter regulation often leads to increased costs which are ultimately passed on by banks to consumers. The purpose of this study was to assess the cost of compliance to the *Anti-Money Laundering and Anti-Terrorism Financing Act 2001* in Malaysia. For the purpose, we surveyed the compliance officers in banks working in Malaysia's dual financial system (conventional banks and Islamic banks). Eighty two usable responses were received. It was found that the regulatory burden of this legislation on banks is increasing significantly. Compliance officers opined, among others, that compliance costs are expected to rise across all business sectors of the banks, both start-up and on-going costs would increase significantly, Several differences were found between compliance officers from Islamic banks and conventional banks with respect to the rankings that they gave to business sectors, start-up costs, on-going costs and such other costs as indicated in this paper. The banks may like to further analyse the various cost items and consider where these can be reduced to bring down the overall burden of compliance costs. In Islamic banks, in particular, the higher costs may be due to requirement that all products need to be Sharia compliant which imposes further cost burden on them. The banks may like to compare the systems that they are using with other banks to identify the areas or processes that could be streamlined so as to reduce costs.

The Malaysian Government has in recent years made the AML/CFT regime not only stricter for existing regulated institutions such as banks but also extended it to designated financial businesses and professionals such as lawyers and accountants. Based on the evidence presented in the study we argue that the Malaysian authorities need to consider the cost of compliance burden on regulated institutions while making the AML/CFT regime ever stricter. We also suggest that regulatory authorities may like to conduct regulatory impact analysis, similar to what is done in other countries such as Australia, before further increasing regulation on banks. The cost of compliance needs to be appropriately weighed against the benefits and as such regulators themselves may consider following a risk-based approach closely monitoring areas of vulnerability instead of applying a one-size-fits-all approach which may prove to be very costly to the banks and in turn to the society. During our discussion with the compliance officers, it was opined by some that they seem to be working for the financial intelligence unit rather than for their institution. It points to the need to develop awareness among them through appropriate training as to how the compliance work that they are doing is preventing their institution from reputational damage and sanctions which may be imposed under the legislation.

Future research may consider how the Malaysian legislation could be made more risk-based so as to reduce compliance cost burden on bank while not diluting the import of the legislation which is to detect and deter criminal activities. A regulatory impact analysis would considerably help in this direction.

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On The Relation between Internal Corporate Governance And Bank Risk-taking: Evidence from Gulf Cooperative Council Countries

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ABSTRACT

This study investigates the relationship between ownership structure, board composition and risk-taking of listed banking companies in the Gulf Cooperative Council (GCC) countries during 2004–2010. Building on limited literature and using OLS and Fixed-effect models, we document that both ownership structure and board composition are important determinants of bank risk-taking behaviour, in particular foreign ownership and larger board size in bringing financial stability and less risk while government ownership and CEO duality having detrimental effect on bank risk-taking, and no particular effect of institutional ownership. These findings have important policy implications for the banking industry in GCC countries with distinct economic, financial and cultural background, and nature of banking system in shaping corporate governance system to restrict the unrestrained risk-taking behavior of banking firms to avoid financial turmoil in the Gulf region.

INTRODUCTION

The role of banks in the economy is distinct as the main driving force of the economic activities in a country, in particular in the emerging markets where stock markets are not yet fully developed as compatible to that of developed economies. Therefore, risk-taking behaviour of banks has emerged as an important phenomenon for the overall financial health and performance of the economy in accelerating growth and economic wellbeing. Because, risk-taking attitude of banks (whether risk taker or averse) can easily be transmitted into the nonbanking sectors depending on the development stage of the country. While corporate governance mechanisms have been developed to restrain excessive risks and associated agency costs to ensuring investors' wellbeing as documented in the agency theory literature, it is of interest to observe the influence of ownership and board related governance variables on bank risk-taking behaviour in emerging markets context, such as Gulf Cooperative Council (GCC) countries.

Gulf Cooperative Council (GCC) countries' financial markets are one of the fastest-growing financial markets in the world since early years of the last decade. The combined asset value of the top 50 GCC banks was around US$506.4 billion in 2005 (Mostafa, 2007). As a result, these economies also have been boosting in terms of operations and size while consolidating distinct nature of banking system, such as the co-existence of both Islamic interest-free and non-Islamic interest-based banking system. In fact, the t oil boom of the early 1980s helped GCC member countries such as Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates to accumulate substantial amounts of financial wealth. The increase in per capita income and savings rate in the GCC countries have been resulted in the development and remarkable growth of the modern banking sector (Mostafa, 2007). Over the years, the GCC countries have gone through massive privatization, banking regulation, market-oriented financial institutions, and privately owned banks with different organizational structures (Omran, 2007) that attracted both regional and international investors to actively invest in the banking sector in addition to the traditional oil and gas sector.

This study explores the relationship between corporate governance and bank risk-taking in the context of the GCC countries. The motivation of this study is the dearth of research in this field on the GCC countries as fastest-growing economies. Although there are several studies on banks' corporate governance structures and their effect on bank risk-taking, such as Barry, Lepetit and Tarazi (2011), Garcia-Marco and Robles-Fernandez (2008), Iannotta Nocera and Sironi (2007), Laeven and Levine (2009), Pathan (2009), Rachdi and Ameur (2011), Sullivan and Spong (2007), but these studies are mostly focused on the Western financial markets.The GCC countries are distinct from the developed Western countries in terms of economic, financial, legal, institutional and governance characteristics. Unlike Western countries, the GCC countries have a mix-form of financial markets (i.e. interest-free and interest-based banking system) with less dominance of stock markets, poor investor protection, poor legal systems and family dominance in corporate ownership and board structures. With such institutional differences, it is interesting as well as contributing to the literature to look at outside the Western countries to observe the effects of governance mechanisms on bank risk-taking at the GCC setting. That is, whether the findings in the GCC countries are consistent with that of Western countries or not, given the contextual differences between the GCC and Western countries as mentioned above.

Building on existing literature, we measure bank risk Z-score and its log transformation first as the dependent variable and then its inverse form (i.e. *1/ Ln Z-score*) to analyze 59 unique banking firms in GCC countries during 2004–2010 with a number of selected corporate governance variables (i.e. both ownership and board structures). Our findings reveals significant impact of most of the ownership and board structure variables on the risk-taking behavior of GCC banks as per the hypotheses developed in the next section. These results contribute to the banking and corporate governance literature in the GCC countries setting with distinct economic, financial and cultural background.

The rest of the paper is structured as follows: Section 2 reviews related literature and develops hypotheses; Section 3 describes the research methodology and sample selection; Section 4 presents the empirical results and finally Section 5 concludes the paper.

LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

■ Institutional Ownership and Bank Risk-taking

Institutional investors are often regarded as active monitors who strive to maximize the value of their equity investments in other companies (Chen, Harford and Li, 2007). However, there could be strategic-alignment and/or conflict of interest between the institutional investor and Investee Company. While active monitoring implies positive impact on performance, negative on leverage and less risk taking, strategic-alignment and/or conflict of interest imply just the opposite.

In the literature there are contrasting views on the role of institutional investors in banks' risk-taking. Bathala, Moon and Rao (1994) find that institutional ownership is negatively related to the level of debt financing in the firm. They argue that institutional investors serve as effective monitoring agents and help to mitigate agency costs. As higher debt levels increase banks' risk and potentially increase agency costs, institutional investors are likely to monitor debt levels to keep banks' risk-taking in control. Similarly, Cebenoyan and Strahan (1995) and Knopf and Teall (1996) find an inverse relationship between levels of institutional ownership and risk taking. However, other researchers argue that institutional investors' goal is to maintain the liquidity of their holdings and short-term profit, which outweighs the benefits of monitoring from long-term firm performance (Bhide, 1994; Maug, 1998). Wright et al. (1996) document that institutional ownership has a significant positive effect on risk-taking indicating an strategic-alignment with bank management to allow investing in risky ventures for very high return. Conventionally, institutional investors are well-equipped in diversifying risk in the market place. However, institutional investors' attitude toward bank risk-taking is that they would like banks to take more risk while maintaining financial stability in their well-diversified investment portfolio. Therefore, we propose the following hypothesis:

Hypothesis 1: Institutional ownership leads to high Z-Score of bank risk-taking (i.e. more stable and less risky bank).

■ Foreign Ownership and Bank Risk-taking

Foreign ownership appears to have a number of positive aspects to banks, unlike their counterparts, for being showing more efficiency in banking business (Berger et al., 2000; Beck, Demirguc-Kunt and Maksimovic, 2004; Calessens Demirguc-Kunt and Huizinga, 2001). These banks are technologically advanced with a variety of new and innovative banking products that benefit client and customers enormous benefits, in one hand, and improve efficiency to attain the economies of scale. Foreign investors are ready to invest in banks developing attractive products and services meeting expectation of the stakeholders, which ultimately contribute to improving operational efficiency and reduction of costs to generate more profit for the banks. Bonin, Hasan and Wachtel (2005) find that banks with foreign ownership are more cost-efficient and significantly different from their counterparts. Moreover, these banks have greater access to the capital market as well as greater ability to diversify risk with a combination of both high and low risk investments. Crystal, Dages and Goldberg (2001) contend that in terms of risk-taking these banks have a greater loss-absorption capacity and thus grow faster as compared to other banks. Further, investors in privatized banks/firms also seek more foreign investments with a view to diversify risk, which ultimately help these banks to take more risk while maintaining financial stability than others.

In regards to governance, foreign investments are more likely to foster superior firm-level governance as compared to firms owned by local investors (Gillan and Starks, 2003; Ferreira and Matos, 2008). Better governance will in turn positively affect corporate risk-taking behaviour (John et al., 2008). Angkinand and Wihlborg (2010), Leye Yeyati, and Micco (2007) and Fungacova and Solanko (2008) also provide evidence that banks with foreign ownership have higher risk-taking with financial stability as measured by high Z-score. Therefore, we propose the following hypothesis:

Hypothesis 2: Foreign ownership leads to high Z-Score of bank risk-taking (i.e. more stable and less risky bank).

■ Government Ownership and Bank Risk-taking

Government ownership is not uncommon in the banking sector in different countries of the world, in particular in the developing economies. The effect of this ownership varies depending on the socio-economic objectives of the government in a particular country. However, from the perspective of the market, government ownership is generally associated with poor performance of banks, high ratio of non-performing loans and inefficiency etc., in one hand, but politically connected, supported, protected and rescued insolvency or bankruptcy, on the other hand.

La Porta, Lopez-de-Silanes and Shleifer (2002) and Barth, Caprio Jr. and Levine (2004) argue that managers in banks those are dominated by government ownership usually face pressure to serve particular political interests. This leads them to gross inefficiency with poor performance. Caprio and Martinez-Peria (2000) find that a greater level of government ownership of banks is associated with a higher likelihood of banking crises in developing countries. Berger et al. (2005) and Iannitta, Nocera and Sironi (2007) find that government ownership dominated banks have poorer loan quality and higher risk than other types of banks, as measured by the ratio of non-performing loans to total loans, the standard deviation of banks' asset returns, and Z-scores. Similarly, Fungacova and Solanko (2008) reveal that government ownership had a significant positive effect on banks' insolvency risk in Russian banks during 1999–2007. Zribi and Boujelbene (2011) also document similar findings. Conversely, Kwan (2004) argues that banks that are highly dominated by government ownership are less risky because they are politically protected from a lack of financial resources. Therefore, we propose the following hypothesis:

Hypothesis H3: Government ownership leads to low Z-Score of bank risk-taking (i.e. less stable and high risky bank).

■ Board Size and Bank Risk-taking

In the governance literature, board size is regarded as a corporate governance mechanism (Dalton et al., 1999). Board size is a function of the costs and benefits involved with the board's functions. While the inclusion of more directors increases the board's monitoring capacity, the incremental cost of poor communication and decision making associated with larger groups may outweigh the benefits. There has been continued debate on the role of board size, although agency theory conceives that larger boards support effective monitoring. Larger boards are likely to provide more expertise and diversity and to increase the board's monitoring capacity (Pearce and Zahra, 1992; Dalton et al., 1998; John and Senbet, 1998). A large board size is practical because complicated operations need to be monitored by a large number of people (Coles et al., 2008). Nevertheless, it is widely held that a small board is more effective in monitoring a firm's activity (Coles et al., 2008). Prior studies suggest that a smaller board is favourable to an increase in a firm's governance processes (Yermack, 1996). Such a view has been argued by Lipton and Lorsch (1992) and supported by Jensen (1993), as they identified the poor coordination and free riding problem associated with larger boards. The smaller board is not subject to coordination and free-rider problems (Lipton and Lorsch, 1992).

The size of the board can also affect banks' risk-taking behaviour. Rachdi and Ameur (2011) suggest that when the number of directors' increases the use of sophisticated instruments to protect against risk also increases, which justifies managers' excessive risk-taking while maintaining financial stability. Further, Pathan (2009) finds an inverse relationship between board size and bank risk-taking (measured by 1/Z-score) suggesting that a smaller bank board is associated with low Z-score of risk-taking of the bank, i.e. it brings high risk and low stability. Consistent with Pathan (2009), a study by Cheng (2008) finds that a firm with a smaller board has a higher variability of corporate performance. He argues that a larger board makes more compromises in order to reach a consensus, which results in more conservative decisions and thus less volatile performance. In a different study, Anderson, Mansi and Reeb (2004) argue that the cost of debt is lower for larger boards—presumably because creditors views these firms as more effective monitors of their financial accounting process. Therefore, we propose the following hypothesis:

Hypothesis H4: Board size is negatively associated with Z-Score of bank risk-taking.

■ CEO Duality and Bank Risk-taking

CEO duality is seen to be detrimental to the firm because it increases the risk of the abuse of power and managerial entrenchment. Fama and Jensen (1983) argue that a concentration of decision management and decision control in an individual reduces a board's effectiveness in monitoring top management. Mamoghli and Dhouibi (2009) find that CEO duality had a significant effect on the insolvency risk of Tunisian banks during 1998–2007. Pathan (2009) also reveals that CEO power (measured by CEO duality and internally hire) is associated with lower bank risk-taking (i.e. high Z-score) of 212 large US bank holding companies during 1997–2004. He argues that managers are risk averse when they occupy the CEO and chairperson positions, and their interests become less aligned with those of shareholders, who prefer more risk-taking by the bank. Therefore, we hypothesize that:

Hypothesis H5: CEO duality is negatively associated with Z-Score of bank risk- taking.

RESEARCH DESIGN

■ Sample

The sample of the study consists of all 59 listed banks in the GCC countries for 7 year periods from 2004 to 2010, which produced a total of 413 firm-years as shown in Table-1 below. Due to data restrictions and unavailability we excluded Oman from the GCC list. The data for the analysis derives from multiple sources of secondary data. We collected the financial data from the annual reports of the sample banks listed on their respective stock exchanges. Corporate governance data were hand-collected from the corporate governance disclosures and directors' reports contained in annual reports.

Table 1: Sample Description

Country	Observations	Percent
United Arab Emirates	154	37.29
Bahrain	91	22.03
Kuwait	56	13.56
Qatar	42	10.17
Saudi Arabia	70	16.95
Total	413	100

■ Model specification

To test the hypotheses, this study uses the following ordinary least squares (OLS) regression equation:

$$BANK\ RISK\ (1/Ln\ Z\text{-}score) = \alpha + \beta_1\ INSTOWN_{it} + \beta_2\ FOROWN_{it} + \beta_3\ GOVTOWN_{it} + \beta_4\ BSIZE_{it} + \beta_5 CEODU_{it} + \beta_6\ SIZE_{it} + \beta_7\ LEV_{it} + \beta_7\ GDPR_{it} + \varepsilon_{it}$$

The dependent variable to measure bank risk is the Z-score. The Z-score measures the distance from insolvency (Roy, 1952). A high Z-score implies that the bank is more financially stable, while a low score denotes high financial volatility. Fungáčová, and Solanko (2008) contend that a higher Z-score corresponds to a greater distance to equity depletion and therefore to lower risk and higher bank stability.

Following the literature, we defined the Z-score as the return on assets (ROA) plus capital adequacy ratio (CAR) ratio divided by the standard deviation of asset returns (Leaven and Levine, 2009; Houston et al., 2010; Rachdi and Ameur 2011). The Z-score in the sample is highly skewed, so we transformed the Z-score into the natural logarithm (i.e. *Ln Z-score*), which is normally distributed. Again, following Pathan (2009), we inverse the variable as *1/Ln Z-score,* which now denotes that the higher the score the higher the bank risk and vice versa. Now, Table-2 below outlines each of the hypothesis expectations developed in this study in relation to the independent variables, towards understanding the bank risk-taking and governance relationship in the regression model.

Table 2: Expected Sign of Variables

Independent variable	Hypothsis	Dependent variable *(1/Ln Z-score)*
INSTOWN	1	Negative
FOROWN	2	Negative
GOVTOWN	3	Positive
BSIZE	4	Positive
CEODU	5	Positive
SIZE		Positive/Negative
LEV		Negative
GDPR		Negative

In relation to the independent variables, we followed the literature to define them. *Institutional ownership* (*INSTOWN*) is defined as institutional shareholdings as a percentage of the total outstanding shares of the firm (McConnell and Servaes, 1990). *Foreign ownership* (*FOROWN*) is measured as foreign shareholdings as a percentage of the total outstanding shares of the firm (Choi and Hasan, 2005). *Government ownership* (*GOVTOWN*) is defined as government shareholdings as a percentage of the total outstanding shares of the firm. Board size (*BSIZE*) is defined as the number of directors on the board (Setia-Atmaja et al., 2009). *CEO duality* (*CEODU*) refers to a situation in which one person is the CEO of the firm as well as the chairperson of the board. Consistent with Boyd (1995), this study uses the CEO duality variable as a dummy that is equal to 1 if the CEO and chairperson are the same person and 0 otherwise.

We control for leverage (*LEV*), which is measured by taking the ratio of book value of total debt to total assets (Faccio, Marchica and Mura, 2011). Bank size (*SIZE*) is the natural log of book value of total assets. We also control for GDP growth (*GDPR*) as an economic variable (Fungacova and Solanko, 2008), as the study includes 5 countries in the Gulf region. According to the literature on financial sector development and economic growth, growth in GDP is positively associated with bank performance. Therefore, we expect a significant effect of GDP growth on bank risk.

EMPIRICAL RESULTS

■Summary statistics

Table 3 provides the descriptive statistics for the variables used in this study. Average bank risk-taking (*Ln Z-score*) by the banks is 2.87 (natural logarithm of the Z-score), which indicates a moderate level of risk in the banking sector in the GCC countries. In regards to the ownership structures, institution ownership (*INSTOWN*), foreign ownership (*FOROWN*) and government-ownership (*GOVTOWN*) hold an average of 31%, 18% and 16%of shares, respectively, in all sample banks. These three dominating shareholdings constitute about 64% of the total shareholdings in the GCC banking sector. Again, the average number of directors (*BSIZE*) on the board is around nine (9) while CEO duality (*CEODU*) in banks is about 24% on average. That is, board size is not too big or small and only one-quarter banks have one person representing the CEO and the Chairperson of the board. Finally, average leverage (LEV) is 79%, which is quite natural for banks, and bank size (*SIZE*) is 16.64 (natural logarithm of total assets), and average GDP growth (*GDPR*) is 5.75%.

Table 3: Summary Statistics

Variables	Mean	Std. Dev.	Min	Max	Observations
BANK RISK	2.87	1.24	-2.05	5.90	413
INSTOWN	0.31	0.22	0.00	0.90	413
FOROWN	0.18	0.25	0.00	0.94	413
GOVTOWN	0.16	0.18	0.00	0.98	413
BSIZE	8.91	1.91	5.00	14.00	413
CEODU	0.24	0.43	0.00	1.00	413
SIZE	16.64	2.39	10.05	21.01	413
LEV	0.79	0.34	0.00	6.65	413
GDPR	0.57	0.04	-0.046	0.16	413

The above table provides summary statistics for our data analysis. *RISK* is measured by the Z-score (1/*Ln Z-score*). The Z-score is defined by the return on assets (ROA) plus the capital adequacy ratio (CAR) divided by the standard deviation of the ROA. *Institutional ownership (INSTOWN)* is defined as institutional shareholdings as a percentage of total outstanding shares, and *foreign ownership (FOROWN)* is measured as foreign shareholdings as a percentage of total outstanding shares. *Government ownership* (*GOVTOWN)* is defined as government shareholdings as a percentage of total outstanding shares. *Board size* is defined as the number of directors on the board. *CEO dual*ity (*CEODU*) is a dummy variable equal to 1 when the chairperson is the CEO and 0 otherwise. *Leverage* (LEV) is calculated as the ratio of book value of total debt to book value of total assets. Bank size (*SIZE*) is the natural log of book value of total assets. *GDP growth (GDPR) is the growth of the gross domestic product.*

■Correlation matrix

Table 4 presents the correlation matrix among the designated variables. Bank risk (1/*Ln Z-score*) is positively correlated with government ownership (*GOVTOWN*), board size (*BSIZE*) and CEO duality (*CEODU*) but negatively correlated with foreign ownership (*FOROWN*). In addition, consistent with prior literature, this study also finds positive correlations between bank risk (1/*Ln Z-score*), bank size (*SIZE*), and leverage (*LEV*). Further, correlations among the independent variables are not indicating any multi-collenearity problem in the regression model. Similarly, VIF scores are also found at a lower level[1].

Table 4: Correlation Matrix

	BANK RISK	FOROWN	BSIZE	CEODU	GDPR	SIZE	INSTOWN	GOVTOWN	LEV
BANK RISK	1.00								
FOROWN	-0.32***	1.00							
BSIZE	0.19***	0.08	1.00						
CEODU	0.20***	0.02	0.27***	1.00					
GDPR	0.07	-0.04	-0.02	-0.02	1.00				
SIZE	0.45***	-0.46***	0.14**	0.03	-0.01	1.00			
INSTOWN	0.04	-0.16***	0.07	0.03	-0.16***	-0.8	1.00		
GOVTOWN	0.13**	-0.19	-0.01	-0.05	-0.08	-0.02	-0.02	1.00	
LEV	0.15**	-0.07	0.07	0.09**	-0.08	0.09	0.07	0.11**	1.00

The above table provides a correlation matrix. *RISK* (1/*Ln Z-score*) is the return on assets (ROA) plus the capital adequacy ratio (CAR) divided by the standard deviation of the ROA. *Foreign ownership* (*FOROWN*) is measured as foreign shareholdings as a percentage of total outstanding shares, and *institutional ownership* (*INSTOWN*) is defined as institutional shareholdings as a percentage of total outstanding shares. *Government ownership* (*GOVTOWN*) is defined as

[1] We obtain variance inflation factors (VIF) for the variables to test for multicollinearity. The test results suggest that there is no multicollinearity among the variables. None of the variables has a VIF value that exceeds 10.

government shareholdings as a percentage of total outstanding shares. *Board size* is defined as the number of directors on the board. *CEO dual*ity (*CEODU*) is a dummy variable equal to 1 when the chairperson is the CEO and 0 otherwise. *Leverage* (LEV) is calculated as the ratio of book value of total debt to book value of total assets. Bank size (*SIZE*) is the natural log of book value of total assets. *GDP growth* (*GDPR*) is the growth of the gross domestic product. *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

■ Regression Findings and Discussion

The main focus of our analysis is to examine the effect of corporate governance (i.e. ownership and board structures) on risk-taking in the GCC banks. Table-5 below presents the OLS regression findings. The results show negative significant effect of foreign ownership on bank risk-taking variable in inverse form (i.e. $\beta = -0.431$, $t = -1.68$, $p < 0.10$). This suggests that higher level of foreign ownership leads to higher Z-score by banks and vice-versa. In effect, banks dominated by foreign ownership are more stable and less risky banks than others. This finding supports hypothesis H2 and is consistent with the findings of previous studies' that banks with foreign ownership have high Z-score (Levy-Yeyati and Micco, 2007; Ferreira and Matos, 2008; Angkinand and Wihlborg, 2010). However, such stability is distorted by government ownership (*GOVTOWN*) in banks showing a significant positive association with bank risk-taking variable in inverse form ($\beta = 0.903$, $t = 3.14$, $p < 0.01$). That indicates that banks with high level of government ownership are more risky and less stable banks having low Z-score. Hypothesis H3 is supported and the finding is consistent with existing literature (Caprio and Martinez-Peria, 2000; Berger et al., 2005, Fungacova and Solanko, 2008).

Again, board size (*BSIZE*) has a significant and positive relationship with bank risk-taking variable in inverse form ($\beta = 0.500$, $t = 1.93$, $p < 0.05$). This means that larger board can contribute to achieve high Z-score, i.e. more financial stability. While hypothesis H4 is satisfied, this finding is opposite to the findings of Cheng (2008) and Pathan (2009). Our results suggest that a bank with a larger board is associated with high Z-Score of risk-taking and vice-versa. In regards to CEO duality, the coefficient shows a positive and significant relationship with bank risk-taking variable in inverse form ($\beta = 0.471$, $t = 3.73$, $p < 0.01$), which is consistent with Pathan's (2009) findings, suggesting that CEO duality (CEO power) is detrimental to bank's financial stability, as it leads to low Z-Score. Thus, hypothesis H5 is also supported. Finally, institutional ownership reveals no significant effect on bank risk-taking, so hypothesis H1 is not satisfied.

Table 5: Corporate Governance and Risk

Variables	1/Ln Z-core (OLS)		
	Coeff. estimate	*t*-Statistic	*P*-value
Intercept	-2.341***	-3.59	0.000
INSTOWN	0.361	1.44	0.150
FOROWN	-0.431*	-1.68	0.095
GOVTOWN	0.903***	3.14	0.002
BSIZE	0.500**	1.93	0.054
CEODU	0.471***	3.73	0.000
SIZE	0.0211***	8.16	0.000
LEV	0.283*	1.81	0.071
GDPR	3.347**	2.43	0.016
N	413		
Adj. R^2	0.30		
F-statistic	21.51		
Significance of *F*	0.000		

The above table provides summary statistics for our data analysis as per OLS. The data consist of 59 samples during 2004–2010. *RISK* is measured by the Z-score (1/*Ln Z-score*). The Z-score is defined by the return on assets (*ROA*) plus the capital adequacy ratio (*CAR*) divided by the standard deviation of the *ROA*. *Institutional ownership* (*INSTOWN*) is defined as institutional shareholdings as a percentage of total outstanding shares, and *foreign ownership* (*FOROWN*) is measured as foreign shareholdings as a percentage of total outstanding shares. *Government ownership* (*GOVTOWN*) is defined as government shareholdings as a percentage of total outstanding shares. *Board size* is defined as the number of directors on the board. *CEO dual*ity (*CEODU*) is a dummy variable equal to 1 when the chairperson is the CEO and 0 otherwise. *Leverage* (LEV) is calculated as the ratio of book value of total debt to book value of total assets. Bank size (*SIZE*) is the natural log of book value of total assets. *GDP growth* (*GDPR*) is the growth of the gross domestic product. *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

■ Further Analysis

This study uses a fixed-effects model (country–year fixed effect) to address the possibility of a spurious relationship between dependent and independent variables due to unobserved country and year-specific heterogeneity. The Hausman test was conducted to determine whether the fixed-effects model (FEM) or the random-effects model (REM) is more appropriate in this study (Greene 2008). As the p-value of the Hausman test was significant, we concluded from the F-statistic that the FEM is more suitable for this study. The FEM results are presented in Table-6 below indicating

consistent findings with OLS except for board size *(BSIZE)* variable. The coefficient for board size becomes insignificant in the FEM when compared with the OLS estimate. Thus, our study fully supports H2, H3 and H5, but not H1 and H4.

Table 6: Corporate Governance and Risk (Fixed Effect)

Variables	1/Ln Z-score Coeff. estimate	(Fixed effect) *t*-Statistic	*P*-value
Intercept	-4.759***	-6.56	0.000
INSTOWN	0.359	1.48	0.139
FOROWN	-1.059***	-3.89	0.000
GOVTOWN	1.042***	3.76	0.000
BSIZE	0.298	1.22	0.224
CEODU	0.292**	2.27	0.024
SIZE	0.426***	11.88	0.000
LEV	0.289**	1.99	0.047
GDPR	-1.648	-0.82	0.413
N	413		
R^2 within	0.38		
R^2 between	0.47		
F-statistic	17.25		
Significance of *F*	0.000		

RISK is measured by the Z-score (*Ln Z-score*). The Z-score is defined by the return on assets (*ROA*) plus the capital adequacy ratio (*CAR*) divided by the standard deviation of the *ROA*. *Institutional ownership* (*INSTOWN)* is defined as institutional shareholdings as a percentage of total outstanding shares, and *foreign ownership* (*FOROWN*) is measured as foreign shareholdings as a percentage of total outstanding shares. *Government ownership* (*GOVTOWN*) is defined as government shareholdings as a percentage of total outstanding shares. *Board size* is defined as the number of directors on the board. *CEO duality* (*CEODU*) is a dummy variable equal to 1 when the chairperson is the CEO and 0 otherwise. *Leverage* (LEV) is calculated as the ratio of book value of total debt to book value of total assets. Bank size (*SIZE*) is the natural log of book value of total assets. *GDP growth* (*GDPR*) is the growth of the gross domestic product. *** Significant at 1%, ** Significant at 5%, * Significant at 10%.

CONCLUSION

This study investigates the relationship between ownership and board structures with risk-taking of listed banking companies in the Gulf Cooperative Council (GCC) countries. Using OLS and fixed-effect model, this study develops several hypotheses in relation to the effect of corporate governance (i.e. ownership and board structures) on bank risk-taking behaviour (measured by 1/Ln Z-score). Empirical data of this study are derived from 59 banks in the GCC countries during 2004–2010. Our results reveal that banks with foreign ownership (*FOROWN*) tend to bring high financial stability and low risk (i.e. high Z-score). However, we find opposite significant effect of government ownership (*GOVTOWN*) on bank risk-taking, i.e. low financial stability and high risk (i.e. low Z-score), and no significant effect of institutional ownership (*INSTOWN*). In regards to board size (*BSIZE*), while we document that larger board can bring high financial stability and low risk (i.e. high Z-score) in the OLS but that is not supported by the fixed-effect model. However, we report that CEO duality (*CEODU*) is detrimental to bank financial stability and risk taking.

These findings of this study imply that both ownership structure and board composition are important determinants of bank risk-taking. Given the vital role and importance of banking governance in the economy, our findings have important policy implications for the banking industry in the GCC countries with distinct economic, financial and cultural background, and nature of banking system in shaping corporate governance system to restrict the unrestrained risk-taking behavior of banking firms to avoid financial turmoil in the otherwise stable financial markets of GCC countries.

One limitation of this study is that we could not consider other corporate governance variables, such as board independence and board ownership, due to the unavailability of data in the annual reports. It is expected that future research in this area will take a broader range of corporate governance variables to observe their effect on banks' financial stability and risk-taking behaviour.

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National Culture as An Influence on Perceptions of Employer Attractiveness

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ABSTRACT

In competitive market for skilled employees, it has become increasingly important for organizations to implement strategies that establish and maintain a brand as an 'employer of choice'. This study aims to investigate how national cultural context influences perceptions of potential employees about employer attractiveness. The study findings demonstrate how the Saudi national cultural context influences the perceptions of potential Saudi employees, and contributes to the literature in two ways: firstly, by demonstrating the need to extend the employer attractiveness framework developed by Berthon, Ewing and Hah (2005) to include dimensions relevant to national cultural context; and secondly, by highlighting the need to give consideration when measuring employer attractiveness to the relative level of importance of each aspect of employer attractiveness in the light of any specific national cultural context.

INTRODUCTION

In competitive markets for skilled employees, it has become increasingly important for organizations to implement strategies that establish and maintain a brand as an 'employer of choice' (EOC) (Bartlett & Ghoshal, 2002; Wickham & O'Donohue, 2009). In highly competitive labour markets, where demand for highly-skilled labour outstrips its supply, the greater bargaining power resides with skilled labour; such market conditions require organizations to rethink traditional strategies and techniques for recruiting and retaining highly skilled employees (Michaels, Handfield-Jones & Axelrod, 2001; Ewing, Pitt, De Bussy & Berthon, 2002). To be successful in attracting highly skilled employees, an organization must differentiate itself from its labour market competitors by offering an 'employment value proposition' (EVP) that is highly attractive and perceived as having superior value by its 'employees-of-choice' (Bakhaus & Tikoo, 2004; Taylor, 2005). In the human resource management literature, there is increasing awareness of the importance of national culture as a contextual influence on the strength and nature of the relationship between an organization's characteristics and how it is perceived by its existing and prospective employees (Sparrow, 2009). Relevant here is research highlighting the importance of considering cross-national differences and the specific cultural context when organizations are constructing their EVP (e.g. Rynes & Barber, 1990; Berthon, Ewing & Hah, 2005; Sanchez & McCauley, 2006). The lesson from such research is that the capacity to recognize the employment implications of different cultural contexts, and offer culture-specific inducements to target employees, is fundamental to an organization's attractiveness (Caligiuri, Colakoglu, Cerdin & Kim, 2010). This lesson applies, given the increasing internationalization of labour markets, not just to employers that operate across national boundaries, but also in the case of employers faced with competitive and increasingly diversified domestic labour markets.

■ Employer Attractiveness

Employer attractiveness is based on the offering of a distinctive EVP, comprising both explicit material elements as well as implicit psychological elements, and reflecting an organization's identity as an employer (e.g. Wright, Dunford & Snell, 2001; Moroko & Uncles, 2008; Edwards, 2009). In developing a distinctive EVP, the organization's main aim is to represent and communicate what it is offering as an employer relative to its competitors in any given type of labour market (Bakhaus & Tikoo, 2004; Srivastava & Bhatnagar, 2010). To do this it must first identify those inducements which its employees-of-choice are likely to perceive as meeting their needs, and which the organization is willing and able to offer. HR practices such as remuneration, training and development, as well as employment contextual factors such as geographical, regional and culture, can be critical to an organization's EVP being recognized as having superior value in the labour market (Corporate Leadership Research Council, 2006; Wickham & O'Donohue, 2009). In taking action to enhance its attractiveness as an employer, an organization must be cognizant that it is dealing with two equally pertinent audiences – existing employees as an internal audience, and potential employees as the external audience (Bakhaus & Tikoo, 2004). Therefore, communicating with and persuading potential and existing employees-of-choice of the superior nature of the organization's EVP must take into account the likelihood that each audience might use different criteria to assess the EVP and so evaluate the organization's attractiveness as an employer (Bakhaus and Tikoo, 2004; Edwards, 2013). The implication here is clear: for an organization to be successful in constructing an EVP which will be perceived as superior, it needs to understand the basis on which its attractiveness as an employer might be measured by its target employees-of-choice (Wickham & O'Donohue, 2009).

Most research on employer attractiveness falls into one of two main groupings: that which is focused on the recruitment process and how employer attractiveness might be best communicated (e.g. Rynes & Barber, 1990; Collins & Han, 2004), and that which focuses on identifying theoretical aspects of the employer attractiveness concept itself (e.g. Turban, 2001; Agrawal & Swaroop, 2009). In terms of this latter focus, several models have been presented in the literature, however the work by Berthon, Ewing and Hah (2005) to develop a framework for measuring employer attractiveness which perhaps has generated the most research interest. The framework (see Table 1) comprises 25 elements organized into five broad categories (namely: Economic; Social; Development; Interest; and Application). Essentially, Berthon, Ewing and Hah (2005) detail a range of attractiveness factors that recognize economic, learning and development, and social influences, and differentiate between the application of job skills and knowledge and vocational interest. The framework recognizes factors such as product quality, employer innovation, and the humanitarian contribution of the employer's activities, but does not include organizational culture as an aspect of employer attractiveness. In addition, while Berthon, Ewing and Hah (2005) acknowledge that different cultural contexts will have different impacts on employee perceptions of employer attractiveness, the framework offers a generic view of employer attractiveness which begs the question of whether it can be applied effectively in different cultural contexts. The full range of items organized into their respective factor categories is shown in Table 1.

Table 1: A framework of employer attractiveness

Factor	Item
Development	Recognition/appreciation from management
	A springboard for future employment
	Feeling good about yourself as a result of working for a particular organization
	Feeling more self-confident as a result of working for a particular organization
	Gaining career-enhancing experience
Social	A fun working environment
	Having a good relationship with your superiors
	Having a good relationship with your colleagues
	Supportive and encouraging colleagues
	Happy work environment
Interest	Working in an exciting environment
	Innovative employer – novel work practices/forward-thinking
	The organization both values and makes use of your creativity
	The organization produces high-quality products and services
	The organization produces innovative products and services
Application	Humanitarian organization – gives back to society
	Opportunity to apply what was learned at a tertiary institution
	Opportunity to teach others what you have learned
	Acceptance and belonging
	The organization is customer-oriented
Economic	Good promotion opportunities within the organization
	Job security within the organization
	Hands-on inter-departmental experience
	An above average basic salary
	An attractive overall compensation package

Source: Berthon, Ewing and Hah (2005).

In the human resource management literature, there is increasing awareness of the importance of national culture as a contextual influence on the strength and nature of the relationship between an organization's characteristics and how it is perceived by its existing and prospective employees (Sparrow, 2009). Relevant here is research highlighting the importance of considering cross-national differences and the specific cultural context when organizations are constructing their employment value proposition (EVP) (e.g. Rynes and Barber, 1990; Berthon, Ewing and Hah, 2005; Sanchez and McCauley, 2006). The lesson from such research is that the capacity to recognize the employment implications of different cultural contexts, and offer culture-specific inducements to target employees, is fundamental to an organization's attractiveness (Caligiuri, Colakoglu, Cerdin & Kim, 2010). This lesson applies, given the increasing internationalization of labour markets, not just to employers that operate across national boundaries, but also in the case of employers faced with competitive and increasingly diversified domestic labour markets. While Berthon, Ewing and Hah (2005) acknowledge that different cultural contexts will have different impacts on employee perceptions of employer attractiveness, the framework offers a generic view of employer attractiveness which begs the question of whether it can be applied effectively in different cultural contexts.

As the needs and preferences of the workforce are likely to reflect the different national cultural values of employees (Sparrow, 2009), it seems obvious that organizations ought to consider the specific cultural context when designing and implementing strategies aimed at enhancing its attractiveness as an employer. There is however limited empirical research explicitly examining cultural factors as influences on perceptions of employer attractiveness. This study addresses that gap by considering the

question: *How does national culture context impact perceptions of employer attractiveness?* It does so by examining the suitability of an established framework of employer attractiveness (Berthon, Ewing and Hah, 2005) for understanding the perceptions of prospective Saudi Arabian employees of their nation's banking industry.

METHOD

The study employed a two-stage approach using a combination of qualitative and quantitative research methods. The first stage consisted of a qualitative component comprising content analysis of information presented by a sample of Saudi banks on their employment/career websites. Website data was used in the study primarily for two reasons: firstly, because of ease of access for the researchers; and secondly, because the use of Intranet and Internet sites as tools for communicating with prospective and existing employees about the employment value proposition being made available has become increasingly commonplace. Indeed, for many organizations the Internet has become the primary mechanism for delivering a consistent message to both existing and prospective employees of choice, and for enhancing efficiency and effectiveness in the staffing process (Williamson, Lepak and King, 2003; Lee, 2005). The second stage involved the development and administration of a survey instrument for gathering quantitative data from a sample of prospective employees on their perceptions of employer attractiveness in relation to the Saudi banking industry.

■ Sample

According to Business Monitor International (2010a), the Saudi banking industry is well capitalized, and competes strongly to provide attractive investment opportunities. The banking industry, which is seeking both domestic growth and global expansion (Timewell, 2007; Business Monitor International, 2010a), faces significant skill shortages in a highly competitive domestic labour market which are hindering recruitment of the necessary skilled labour (Idris, 2007; Timewell, 2007; Al Bawaba, 2008). The sample for the collection of the qualitative data in the first stage of the study comprised eight Saudi banks, of a total of 12 registered by the Saudi Arabia Monetary Agency (2010), which include career/employment content on their internet sites additional to contact details for employment enquiries. Table 2 provides some descriptive information for each bank in the sample.

Table 2: Sample of Saudi banks

Bank Name	Total Employees	Number of Branches	Total Assets (SR)	Net Income (SR)
National Commercial Bank	5399	282	257b	2,271m
Banque Saudi Fransi	2,342	79	121b	2,471m
Riyad Bank	2,306	216	176b	3,030m
Samba Financial Group	3,000	66	186b	4,500m
Saudi Hollandi Bank	1,747	43	59b	86m
Al Rajhi Bank	7,447	550	170b	6,767m
Arab National Bank	3,600	171	110b	2,370m
Bank Al Jazira	1,741	48	30b	27m

The convenience sample of prospective employees for the collection of quantitative survey data consisted of Saudi nationals undertaking business studies at a medium-sized Australian university. There were 36 males and three females for a total of 39 students, of whom 34 were engaged in postgraduate level studies and 5 were studying at an undergraduate level. Given the business focus of their studies, all students represented prospective employees of interest to Saudi banks include in the study.

■ Measures of employer attractiveness

As stated above, the primary tool for measuring employer attractiveness was the theoretical framework and associated instrument developed by Berthon, Ewing and Hah (2005). For the first stage of qualitative data collection and analysis, the content of the career/employment pages from each bank website was downloaded into an electronic file, and then analyzed and coded by the researchers using the 25 item framework described by Berthon, Ewing and Hah (2005). Coding was done at the sentence level and involved counting those sentences that explicitly used keywords found in the content of each item. Information included in a website but which could not be coded against any of the 25 items was also identified and considered for inclusion as additional indicators of employer attractiveness for the Saudi banking industry. By this process seven additional items reflecting information identified in two or more bank websites and for which three or more sentences were able to be counted (see Table 3), were thus added in the appropriate classification category to the 25 item instrument developed by Berthon, Ewing and Hah (2005). This process resulted in an expanded 32 item framework being used for coding purposes.

By totalling the number of sentences coded for each of the 32 items, each website was allocated an item reference score using a seven point scale (ranging from 1 = Zero sentences referring to an item to 7 = Six or more sentences). All scores for items 1 to 25, organized within the five factor classification system as used by Berthon, Ewing and Hah (2005), were used to determine an average

classification reference score to gauge the extent to which each specific classification of items was emphasized by each bank.

Table 3: Additional seven items of employer attractiveness

Classification*	#	Item
Application	26	Compliant with Islamic Sharia'h
	29	Stakeholder oriented
Social	27	Organization's reputation
	32	Good organizational culture
Interest	28	The organization distinguishes itself from competitors
Economic	30	Organization supports work life balance
	31	International organization

* Note: No additional items were identified under Berthon, Ewing & Hah's (2005) 'Development' classification

In the second stage of data collection and analysis, the expanded 32 item survey instrument was distributed personally by one of the researchers to the Saudi nationals that comprised the sample of prospective employees. Participants were asked to complete and return the confidential survey questionnaire inside a sealed envelope provided for the purpose. Participants were advised that participation in the survey was voluntary and that the data they provided would be treated in line with approved procedures designed to protect their anonymity and privacy. A total of 39 forms were distributed and 39 completed and usable forms were returned. Survey participants were asked to indicate, using a five point Likert scale (ranging from 1 = Strongly Disagree to 5 = Strongly Agree), the extent to which they agreed that each of the 32 items listed would be important to them if they were considering a potential employer in the Saudi banking industry. Mean and standard deviation scores were calculated for each item and classification category. These scores were taken as indicative of the importance that survey respondents placed on each item as a component of employer attractiveness.

RESULTS

■ Qualitative analysis – bank website data

Table 4 presents the results of the content analysis of the qualitative data in terms of all 32 items by classification category of employer attractiveness. The Development classification of items had the highest mean classification reference score (2.67), making its items collectively the most frequently referenced in the sampled Saudi bank websites. The two highest mean item reference scores by any of the 32 items were both within the Development classification. Item 6 'Gaining career-enhancing experience' had the highest mean item reference score of 5.00. All eight bank websites had at least two sentences for this item, with three banks having six or more sentences. Item 3 'A springboard for future employment' was the next highest mean item reference score with 4.12. The lowest mean item reference score of 1.25 for the Development classification was for Item 4.00 'Feeling good about yourself as a result of working for a particular organization' which was mentioned on only one bank website. Interestingly, although Development had the highest mean classification reference score, it contained one item – Item 5. 'Feeling more self-confident as a result of working for a particular organization' for which no sentences were identified on any bank website in the sample.

The second highest referenced classification of items was Application with a 2.16 mean classification reference score. Only two banks had classification reference scores above the mean, whereas six of the sample had mean classification reference scores of 2.00 or lower. Item 20 'The organization is customer-orientated' had the highest mean item reference score of 3.00 in the Application classification, with six of the eight banks referencing this item at least once. Four banks had classification reference scores above the item mean, with two of these banks having six or more sentences about this item (i.e. item scores of 7) on their websites. The second highest mean item reference score was 2.87 for Item 16 'Humanitarian organization – gives back to society'. Item 17 'Opportunity to apply what was learned at a tertiary institution' had the lowest mean item reference score of 1.50 in the classification; three banks had higher item reference scores. Interestingly, the mean item reference score for (additional) Item 26 'Compliant with Islamic Sharia'h' ranked third lowest of the seven items in this classification.

Table 4: Website scores by item and classification

Classification	#	Item	Score (7 point scale)	Std Dev
Development	1	Recognition/appreciation from management	2.00	1.60
	3	A springboard for future employment	4.12	1.73
	4	Feeling good about working for a particular organization	1.25	0.46
	5	Feeling more self-confident for working for an organization	1.00	0.00
	6	Gaining career-enhancing experience	5.00	1.93
		Classification	2.67	1.14
Application	16	Humanitarian organization – gives back to society	2.87	1.96
	17	Ability to apply what was learned at a tertiary institution	1.50	1.07
	18	Opportunity to teach others what you have learned	1.62	0.74
	19	Acceptance and belonging	2.12	1.46
	20	The organization is customer-orientated	3.00	2.56
	26	Compliant with Islamic Sharia'h	1.87	1.46
	29	Stakeholder oriented	2.12	1.73
		Classification	2.16	1.57
Social	2	A fun working environment	1.12	0.35
	7	Having a good relationship with your superiors	1.00	0.00
	8	Having a good relationship with your colleagues	1.12	0.35
	9	Supportive and encouraging colleagues	1.50	0.76
	23	Happy work environment	1.00	0.00
	27	Organization's reputation	4.20	2.38
	32	Good organizational culture	4.00	2.78
		Classification	2.00	0.94
Interest	10	Working in an exciting environment	1.25	0.71
	11	Innovative employer ; novel work practices/forward-thinking	1.75	1.39
	12	The organization values and makes use of your creativity	1.87	0.99
	13	The organization produces high-quality products and services	2.87	2.17
	14	The organization produces innovative products and services	1.12	0.35
	28	The organization distinguishes itself from competitors	3.00	2.39
		Classification	1.98	1.33
Economic	15	Good promotion opportunities within the organization	1.25	0.46
	21	Job security within the organization	1.00	0.00
	22	Hands-on inter-departmental experience	1.50	0.76
	24	An above average basic salary	1.87	1.25
	25	An attractive overall compensation package	3.50	2.98
	30	Organization supports work life balance	1.37	0.52
	31	International organization	2.50	1.51
		Classification	1.86	1.07

Note: The seven **additional** items identified in the analysis of the sample bank websites are shaded.

Of the remaining three classification categories, the highest mean reference score was Social with 2.00. In this classification, (additional) Item 27 'Organization's reputation', and (additional) Item 32 'Good organizational culture', had mean item reference scores of 4.20 and 4.00 respectively. These scores were substantially higher than the other mean item reference scores for this classification; indeed, Item 7 'Having a good relationship with your superiors' and Item 23 'Having a happy work environment' were not mentioned by any of the eight banks. The Interest classification had a mean reference score of 1.98: four of the eight sample banks had classification reference scores above this score. Mean item reference scores in this classification ranged from (additional) Item 28 'The organization distinguishes itself from competitors' at 3.00 to Item 14 'The organization produces innovative products and services', which only one of the eight sample banks referenced, with a mean item reference score of only 1.12. The least frequently referenced classification of items was the Economic factor with a mean reference score of 1.86. Interestingly, Item 25 'An attractive overall compensation package' with a mean item reference score of 3.50 was fourth highest of the 32 items. Three of the sample banks referenced it six or more times; while three did not reference the item at all on their websites. (Additional) Item 31 'International organization' was second highest in this classification with a mean item reference score of 2.50. Of the remaining items in the classification, there was either no reference (Item 21 'Job security within the organization') or minimal references identified in the sample bank websites.

In summary, the website analysis indicated that at the classification level the Development classification set of items rated the highest reference score followed by the Application classification set of items across the bank websites. At the level of individual items, 7 items – Item 3 'A springboard for future employment', Item 6 'Gaining career-enhancing experience', Item 20 'The organization is customer-orientated', Item 25 'An attractive overall compensation package', (additional) Item 27 'Organization's reputation', (additional) Item 28 'The organization distinguishes itself from competitors', and (additional) Item 32 'Good organizational culture' – had individual reference scores of 3 or greater i.e. were referred to most often of the 32 items in two or more sentences on bank websites.

■ Quantitative analysis – prospective employee survey data

Table 5 presents the results of the analysis of the quantitative survey data obtained from the respondents relating to the perceived importance of all 32 items by classification category of employer attractiveness. According to analysis of the survey data, respondents deemed the most important set of items to be those within the 'Development' classification, which had a classification importance score of 4.07. Within the 'Development' classification, the highest item importance score of 4.21 was recorded for Item 5 'Feeling more self-confident as a result of working for a particular organization'; with the other four item importance scores ranging from 4.16 down to 3.74 for Item 3 'A springboard for future employment'. The second most important classification of items was 'Social' with a classification importance score of 4.06. All but one of the seven items in this classification had item importance scores of 4.00 or higher. Item 8 'Having a good relationship with your colleagues' was scored as the most important item at 4.28, and Item 2 'A fun working environment' was scored 3.66 as the least important item. One of the additional items – Item 27 'Organization's reputation', with an item importance score of 4.18, rated second highest within this classification. The set of items within the Economic classification was ranked third most important overall with a classification importance score of 4.05, just marginally below the 'Development' and 'Social' classifications.

Item 21 'Job security within the organization' ranked as the most important in the classification with an item importance score of 4.41, with Item 15 'Good promotion opportunities within the organization' scoring 4.33 to be the second most important in the classification. Item 22 'Hands-on inter-departmental experience' and the (additional) Item 31 'International organization' scored least importance at 3.79 and 3.74 respectively. The second lowest classification overall in terms of importance was the 'Interest' set of items with a classification importance score of 4.03. Item 11 'Innovative employer – novel work practices/forward-thinking' and Item 14 'The organization produces innovative products and services' were rated as least important at 3.71 and 3.92 respectively; the other items in the set were led by Item 12 'The organization both values and makes use of your creativity' with an item importance score of 4.31. The (additional) Item 28 'The organization distinguishes itself from competitors' had the second highest item importance score 4.18 in the classification. The classification of items ranked least important of all was 'Application' with a classification importance score of only 3.75. Only one item, perhaps not surprisingly (additional) Item 26 'Compliant with Islamic Sharia'h', scored the highest item importance score of 4.36 in this classification. In contrast, the second lowest important item was another (additional) item – Item 29 'Stakeholder oriented' – with an item importance score of only 3.58.

In summary, the survey analysis indicated that at the classification level the Development classification set of items rated the highest importance score followed by the Social classification set of items, as perceived by the survey respondents. At the level of individual items, 19 had individual importance scores of 4 or greater (on a 5 point scale) i.e. were matters considered by respondents as being the most important of the 32 items in their perception of the attractiveness of an employer.

Table 5: Importance scores of survey items and classifications

Classification	#	Item	Score (5 point scale)	Std Dev
Development	1	Recognition/appreciation from management	4.16	1.01
	3	A springboard for future employment	3.74	0.72
	4	Feeling good about yourself as a result of working for a particular organization	4.13	0.81
	5	Feeling more self-confident as a result of working for a particular organization	4.21	0.84
	6	Gaining career-enhancing experience	4.15	0.99
		Classification	4.07	0.87
Social	2	A fun working environment	3.66	1.02
	7	Having a good relationship with your superiors	4.00	1.01
	8	Having a good relationship with your colleagues	4.28	0.61
	9	Supportive and encouraging colleagues	4.13	0.78
	23	Happy work environment	4.13	0.83
	27	Organization's reputation	4.18	0.90
	32	Good organizational culture	4.00	0.89
		Classification	4.06	0.86
Economic	15	Good promotion opportunities within the organization	4.33	0.87
	21	Job security within the organization	4.41	0.94
	22	Hands-on inter-departmental experience	3.79	1.02
	24	An above average basic salary	4.08	0.84
	25	An attractive overall compensation package	4.05	0.77
	30	Organization supports work life balance	3.97	0.87
	31	International organization	3.74	0.91
		Classification	4.05	0.89
Interest	10	Working in an exciting environment	4.03	0.86
	11	Innovative employer – novel work practices/forward-thinking	3.71	0.80
	12	The organization both values and makes use of your creativity	4.31	0.66
	13	The organization produces high-quality products and services	4.03	0.94
	14	The organization produces innovative products and services	3.92	0.85
	28	The organization distinguishes itself from competitors	4.18	0.85
		Classification	4.03	0.83
Application	16	Humanitarian organization – gives back to society	3.66	1.02
	17	Opportunity to apply what was learned at a tertiary institution	3.68	0.96
	18	Opportunity to teach others what you have learned	3.56	1.02
	19	Acceptance and belonging	3.71	0.84
	20	The organization is customer-orientated	3.71	0.93
	26	Compliant with Islamic Sharia'h	4.36	1.06
	29	Stakeholder oriented	3.58	0.92
		Classification	3.75	0.96

Note: The seven additional items identified in the analysis of the sample bank websites, which do not form part of the 25 item framework developed by Berthon, Ewing and Hah (2005), are shown as shaded.

DISCUSSION

In terms of the five categories used to classify the 32 items of employer attractiveness that were used in this study (i.e. the seven additional items drawn from the sample bank websites plus the established 25 items), analysis of the bank website data indicated the following order of emphasis in information by the sample banks overall: (i) Development, (ii) Application, (iii) Social, (iv) Interest and (v) Economic. In contrast, analysis of the survey data indicated that respondents ranked the five classifications, in terms of their perceived importance as factors of employer attractiveness, in a different order: i.e. (i) Development, (ii) Social, (iii) Economic, (iv) Interest and (v) Application. That the Development classification was perceived as the most significant by both the banks and the survey sample is in line with a previous study by Ng, Burke, and Fiksenbaum (2008) revealing that professional development is the most attractive factor for job seekers when considering an employer.

Table 6 shows the rank order for each of the 32 items according to mean survey (importance) scores and mean website (reference) scores. A large disparity was evident in the cross-rankings of most of the leading item importance and reference scores. The item ranked first for importance – Item 21 'Job security within the organization' – ranked 31st out of 32 items in terms of the website item reference scores. The item ranked first in website references – Item 6 'Gaining career-enhancing experience' – ranked only 10th in terms of survey item importance scores. Only three items in the top 10 importance scores also featured in the top 10 website reference scores – Item 6 'Gaining career-enhancing experience' (ranked 10th in importance and first in website references), Item 27 'Organization's reputation' (ranked seventh in importance and second in website references), and Item 28 'The organization distinguishes itself from competitors' (ranked eighth in importance and seventh in website references).

Table 6: Comparison of rank order for website reference scores and survey importance scores by item

#	Item	Survey rank	Website rank
21	Job security within the organization	1	31
26	Compliant with Islamic Sharia'h	2	16
15	Good promotion opportunities within the organization	3	25
12	The organization both values and makes use of your creativity	4	14
8	Having a good relationship with your colleagues	5	27
5	Feeling more self-confident as a result of working for a particular organization	6	29
27	Organization's reputation	7	2
28	The organization distinguishes itself from competitors	8	7
1	Recognition/appreciation from management	9	13
6	Gaining career-enhancing experience	10	1
4	Feeling good about yourself as a result of working for a particular organization	11	23
9	Supportive and encouraging colleagues	12	19
23	Happy work environment	13	32
24	An above average basic salary	14	15
25	An attractive overall compensation package	15	5
10	Working in an exciting environment	16	24
13	The organization produces high-quality products and services	17	8
7	Having a good relationship with your superiors	18	30
32	Good organizational culture	19	4
30	Organization supports work life balance	20	22
14	The organization produces innovative products and services	21	28
22	Hands-on inter-departmental experience	22	21
3	A springboard for future employment	23	3
31	International organization	24	10
11	Innovative employer – novel work practices/forward-thinking	25	17
19	Acceptance and belonging	26	11
20	The organization is customer-orientated	27	6
17	Opportunity to apply what was learned at a tertiary institution	28	20
2	A fun working environment	29	26
16	Humanitarian organization – gives back to society	30	9
29	Stakeholder oriented	31	12
18	Opportunity to teach others what you have learned	32	18

Note: The seven additional items identified in the analysis of the sample bank websites which do not form part of the 25 item framework developed by Berthon, Ewing and Hah (2005), are shown as shaded.

Differences in the cross-rankings of the seven additional items included in the employer attractiveness measures were also quite marked. The leading additional item – Item 26 'Compliant with Islamic Sharia'h' – ranked second highest of all items in terms of importance but had a website reference score of 16th that ranked lower than all but one of the additional item website reference scores (Item 30 'Organization supports work-life balance' ranked 22nd). Five of the seven additional items ranked higher in importance than 10 of the 25 items included in the Berthon, Ewing and Hah (2005). All of the website reference scores for the seven additional items ranked higher than 10 of the 25 items included in the Berthon, Ewing and Hah (2005).

Of the 14 items that focus most closely on the organization rather than on the prospective employee (Items 2, 11, 12, 13, 14, 16, 20, 26, 27, 28, 29, 30, 31, and 32), only four – Item 12 'The organization both values and makes use of your creativity', Item 26 'Compliant with Islamic Sharia'h', Item 27 'Organization's reputation', and Item 28 'The organization distinguishes itself from competitors' – were ranked in the top 10 importance scores. In terms of website reference scores, however, five of the 10 items with an organizational focus that were ranked outside the top 10 importance scores (Items 13, 16, 20, 31, and 32) were ranked in the top 10 website reference scores.

The significant disparity in the results of the employer website data analysis and the prospective employee survey data analysis raises the question of whether the disparities between the two sets of data are specific to the Saudi context or whether they can exist in another cultural context. A review of relevant literature identified studies that covered five of the seven additional items. Firstly, with regard to the (additional) Item 27 'Organization's reputation', Bourhis and Mekkaoui (2010) found a firm's reputation to have a significant main effect on employer attractiveness in a study surveying university students in Canada. Similarly, in separate two studies involving survey data collected from university students in the United States: Greening and Turban (2000) found a positive association between an organization's reputation and employer attractiveness; and, Turban and Cable (2003) presented results indicating that companies with better reputations attracted more applicants. Moreover, in a survey of U.S. companies recruiting from a north-eastern university, Collins and Han (2004) described how organizational reputation influences applicant pool quality and quantity. These research studies provide support for the findings of this study that an organization's reputation is perceived by prospective employees as an important element in employer attractiveness in cultural contexts other than just Saudi Arabia. In other words, research generally suggests that the importance of perceptions of an organization's reputation is not culture-specific.

Secondly, with regard to what might be seen as a closely-related issue, (additional) Item 28 'The organization distinguishes itself from competitors', Michaels, Handfield-Jones, and Axelrod (2001) writing in the United States context suggested the distinctiveness of an organization was an important characteristics for employers to attract new employees. While not directly emphasizing their distinctiveness from their labour market competitors, several of the Saudi banks in this study presented a 'go with a winner' message, thereby attempting by implication to differentiate themselves from their competitors in a context where the finance industry is highly competitive. Again however, the research evidence generally suggests that distinctiveness from your competitors is not a culture-specific element in employer attractiveness.

Thirdly, that the (additional) Item 30 'Organization supports work-life balance', to which the literature reporting research in Western nations accords significant weight, was referenced in only three of the eight banks websites (one sentence each), suggests that overall the Saudi banks do not see a need for emphasizing this aspect to represent themselves as attractive employers. This approach appears to be supported by the survey data in which the respondents scored the item as having the second lowest importance rating of the seven additional items. The limited visibility of work-life balance as a matter relevant to perceptions of employer attractiveness by respondents may perhaps be explained in part by the low seven per cent participation rate of the Saudi women in the work-life balance issues of lesser significance in Saudi Arabia than in other countries (Mansour, 2008). For example, the work-life literature clearly shows that the issue is of cultural significance in European cultures where female participation rates in the workforce in other countries rank much higher e.g. Denmark and Sweden at more than 70 per cent, the UK and the Netherlands with approximately 65 per cent (Boje, 2007). On the other hand, that there is little emphasis on this issue in the website and survey data collected for this study, may well reflect that the Saudi culture makes work-life balance a 'given' and it is therefore not a factor in employer attractiveness.

The two additional items, Item 31 "International organization' and Item 32 'Good organizational culture', were examined by Agrawal and Swaroop (2009) in their study involving university students in India. Agrawal and Swaroop (2009) presented results implying that a favourable impression of and high regard for an organization were important predictors of students' intentions and thus job seeking behaviour. In this study, (additional) Item 31 was scored by survey respondents as of low importance and was also not strongly emphasized in the banks career websites; in contrast, (additional) Item 32 was perceived by the survey respondents as an important element in employer attractiveness, and was also referenced in three sentences on average on the Saudi bank websites. Given that research thus shows a 'good organizational culture' and an 'international' dimension to the organization, i.e. the focus of (additional) Items 31 and 32, as relevant in a range of cultural contexts (Saudi, Indian, and Australia where the Berthon, Ewing & Hah [2005] framework originated), it would appear that they too are not culture-specific contextual elements to employer attractiveness.

Of the two remaining (additional) items (26 and 29), Item 29 'Stakeholder oriented' rated more highly in terms of website reference scores than it did as measured by importance scores; neither score suggested it was considered relevant by the banks or the sample of prospective employees. However, the study results suggest that Item 26 'Compliant with Islamic Sharia'h' is important factor in relation to employer attractiveness in the Saudi context. In that cultural context, Islamic Sharia'h religious law imposes culture-specific conditions on economic activity particularly in regard to the nature of activity in the Saudi banking industry. These conditions are not governmental law, but form a very powerful part of the cultural norms governing Saudi society. Thus, the degree to which a banking organization complies with those norms might be expected to influence strongly both the perceptions of potential employees within the Saudi context, and the way such organizations present themselves to attract future employees. In this study the survey sample of prospective employees ranked this (additional) item as the second most important element, behind Item 21 'Job security in the organization', of the 32 survey items. This finding provides support for the idea that very pervasive context-specific cultural norms, as Islamic principles are, can influence perceptions of employer attractiveness. Interestingly, given the imperatives of the government's 'Saudization' program, only three banks in the sample referenced their compliance with Islamic Sharia'h law, suggesting perhaps an underestimation on the part of the majority of Saudi banks of the influence this element has on the extent to which Saudi nationals are likely to perceive them as attractive employers.

CONCLUSION

The purpose of this study was to investigate how national cultural context influences perceptions of potential employees about employer attractiveness. It applied an established framework of employer attractiveness developed by Berthon, Ewing and Hah (2005) in a different cultural context than that studied here. The empirical study findings suggest that the impact of cultural context on perceptions of employer attractiveness is a factor of relevance that needs to be considered. In the Saudi banking context, we found that perceptions of compliance with Islamic Sharia'h law is an important factor which positively influences how attractive a bank is perceived by potential

employees. The implication here is that context-blind frameworks may have limited value outside of their development context; consistent with the literature, the findings also point to an organization's reputation, the perceived difference between it and its labour market competitors, and good organizational culture are of significant importance for the Saudi banking industry context. One practical implication of the study finding of a large disparity in the rankings of perceived importance scores and website reference scores for most items is that employers need to match the information they present about themselves to the information needs of the prospective employees. In other words, to be perceived as an attractive employer, organizations must present information about themselves that reflects what prospective employee perceive as attractive rather than what the organization itself thinks is its most attractive features.

There are several limitations to this study. First is the size and nature of the survey sample which make it non- representative of Saudi job seekers. Second, the study focuses on a Saudi industry for which quite specific religious teachings apply, and therefore the findings cannot be generalised to other industries that have different dynamics and characteristics. Third, data for this study was generated in part by analysing the employment-related pages on the sample banks' websites, which is not the only way organizations promote themselves to prospective employees. Future research into contextual influences on employer attractiveness could address these issues through other mono-cultural industry contexts, as well as in comparative studies of multi-cultural, multi-industry contexts.

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Perceived Organizational Justice And A Wildcat Strike : A Study Conducted in China

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ABSTRACT

China has witnessed an increased number of labor strikes in recent years. This paper is aimed to explain such phenomenon from the perspective of organizational justice. The predicted relationship between labor strikes and organizational justice was examined with a field study conducted in a company in China, where a strike was ended approximately six months before the study took place. The case study results demonstrated the presence of three types of organizational injustice among the workers–distributive injustice, procedural injustice, and interactional injustice. Recommendations were provided on management practices for preventing labor strikes.

INTRODUCTION

Three decades ago, the Chinese government began several major reforms in its economic system, including the adoption of an open door policy, introduction of a market-driven economy, allowing diversity in the ownership of businesses, and the introduction of a household responsibility system for the use of land in rural areas (Yuan and Fang 1998). The reform policies brought tremendous economic development to the nation. China's GDP grew at an average rate of 9.67% from 1978 to 2006, reaching 2,645 billion USD by the end of 2006 (People's Daily 2007). The GDP growth rate has shown no sign of slowing down in recent years, achieving 10.23% from September 2006 to September 2010 (Trading Economics 2010) and 9.2% by the end of 2011(Xinhua 2012). According to the World Bank (2009) more than 500 million inhabitants were lifted out of poverty from 1980 to 2004.

While China is experiencing a historically unprecedented level of prosperity, it has to face some serious problems that have emerged during the development process, e.g., environmental pollution, a widening gap between the rich and the poor, and increase in unemployment and other labor-related problems. One of the more prominent labor problems in China is the growing number of labor protests and strikes. The official numbers of labor incidents (public gatherings, strikes, petitions and demonstrations) rose from 2,500 in 1993, 3,700 in 1995 to 87,000 in 2005 (Friedman and Lee 2010; Lee 2000). Albeit missing official numbers in recent years, media reported a staggering number of 120,000 labor incidents in 2008 (International Herald Tribune, 9 February 2009). The dramatic increase of labor strikes in China demands a closer look of the causes behind this social phenomenon.

Since action may be rendered meaningful if related to context, below we offer a briefing on dramatic change of labor relations brought by economic reforms in China in the past three decades. This briefing will hopefully provide some background information about some of the preconditions that may have shaped the expectations, attitudes, and actions of the major actors involved in the strike studied.

■ The Social Background of the Chinese Labor Problems

Between 1950s to 1980s, Chinese workers in urban cities were covered by a system of socialist social contract (the so called "iron rice bowl"), under which the state provided workers with lifetime job security, full coverage of welfare, entitlements to pensions, housing, medical care and educational opportunity and expected political loyalty and compliance from workers in return (Friedman and Lee 2010). This employment system broke with reform from a state planning economy to a market-driven economy, introduction of private and foreign economic sectors and transferring of personnel management power from the state government to the enterprise management. Labor contract replaced social contract. Lifetime employment was abandoned. Pension, housing and medical insurance are supposed to be governed with labor laws instead of an entitlement for workers.

The new employment system shapes a new type of labor-management relation, under which 1) workers rely on management for living; 2) managers have unconditional power for labor control, and 3) workers view such control as violations of their rights and interests (Lee 2002). Under the new social security system, three parties (the local government, the enterprise and the individual employee) are supposed to contribute to the funds for various employee benefits. However, pooling contribution from the local government often appears to be difficult for places with slow economic development. Moreover, a majority of enterprises choose not to pay for social security insurance (Lee 2002). This leaves the social security system virtually inoperable and workers completely dependent on their wage for living. Policies regarding compensation, employment and termination varied widely based on each company's financial status, business goals, and strategies, resulting in a widening gap of wealth among the Chinese population (Shen 2006).

The new employment system grants individual enterprises full autonomy for employee management. Management, thus, owns dominant power over employees. Although management power was initially planned to be restrained by the labor contract counterbalanced and by the power of the official union (Lee, 2002), none achieves the goal.

A large percentage of enterprises in China avoid signing labor contract with their employees although it is mandatory according to the Labor Contract Law (The Central People's Government of the People's Republic of China 2007). Labor contracts signed are often kept exclusively by the company. Moreover, employees usually lack full understanding of the contract terms. (Lee 2002). As a result, it becomes impossible for employees to be protected by labor contract. The failure of enforcement of labor law was identified as one of the major reasons for workplace disputes (Cooke 2008).

In contrast to the dominant power management has, workers in China have limited power to fight for their interests. About 74% of the Chinese employees are officially members of the All-China Federation of Trade Unions (ACFTU) (ACFTU, 2009), the only legal union in China. The ACFTU, however, is different from conventional unions in other parts of the world. Wang (2007) contended that as a subordinate body of the Chinese Communist Party (CCP), ACFTU has operated under the supervision and guidance of the CCP since its establishment. The Chinese labor law states that the major goal of the ACFTU is to serve the interests of the country and at the same time represent and protect the interests of labor (The Central People's Government of the People's Republic of China, 2005). The primary concerns for China at the moment are economic development and social stability. Confrontation with the management of enterprises (especially foreign-invested ones) may cause a decline of foreign investment, which could eventually harm the national economic interests. Therefore, the ACFTU could not truly represent the workers in opposition to management. In addition, many union leaders are paid by the company (Lee 2002), which essentially makes them an agent of the company rather than an agent of the workers. As Shen (2006) noted, institutional constraints result in the ACFTU office being more pro-management than pro-labor. ACFTU offices in enterprises pay more attention to workers' recreation and welfare rather than their working conditions and labor rights (Lee 2005). They may represent individual workers or groups of workers in their claims through the state-sanctioned channels such as civil litigation or labor dispute arbitration (Chen 2003). However, ACFTU stayed away from workers' collective actions such as collective bargaining or strikes. Moreover, the 2001 Trade Union Law stipulates that ACFTU should take a pro-production mediating role in the case of a slowdown or production stoppage (Lee 2005). The ambiguous role of ACFTU prevents it from effectively fighting for workers' interests, which contributes to the growth of labor disputes in China (Cooke 2008).

In short, the social contract employment system was gradually replaced by a labor contract employment system in China. Loss of life-time job security and warranted retirement benefits completely shatters employees' sense of entitlement. As more professional jobs are created due to development of market and diversification of businesses, labors move down to the bottom of the economic structure. This new reality may appear particularly harsh for workers who were educated into a collective mindset of "workers are the owners of enterprises". The huge difference between reality and expectations brings the issue of fairness up to the front (Lee 2000; Shen 2006).

■ Sense of Injustice and Collective Action

Research on justice shows that people will experience a sense of injustice when their expectation is not met (Mikula 1986; Shklar 1990). This emotional response to injustice experience can lead to political action (Moore, 1978). The goal of this paper is to demonstrate the impact of workplace injustice on labor strikes in China.

Organizational justice has been found to be closely related to organizational behaviors and employee collective actions (Adams 1965; Greenberg 1993b; Moorman 1991; Cropanzano and Folger 1991; Sheppard, Lewicki, and Minton 1992), but research on the relationship between organizational justice and labor strikes is sporadic (Devinatz 2003). To the authors' knowledge, little research on this topic has been conducted in China. In this study, the authors will analyze the mechanisms that operate behind the occurrence of a labor strike as they relate to workers' organizational justice based on information gathered from interviews conducted in a Chinese company, which had experienced a large-scale strike. The findings of this study will not only contribute to research on labor strikes and labor relations in China but also provide significant practical implications on management of workers and labor strikes. The rest of this paper will be dedicated to the following sections: 1) a review of the literature on organizational justice along with arguments for and presentation of the relationship between organizational justice and wildcat strikes in China; 2) a description of the study site, the strike event, and the data collection method; and 3) a discussion of the findings, practical implications, and study limitations.

THEORETICAL FRAMEWORK

■ Organizational Justice

Organizational justice refers to the fairness of the treatment that employees receive in an organization. Researchers have identified three types of organizational justice. The first one is distributive justice, which is defined as the fairness of outcomes in distributing organizational resources among employees, including pay, bonuses, and other resources that an organization can provide to its employees (Adams 1965; Deutsch 1975).

The second type of organizational justice–procedural justice–is defined as fairness in the procedure of determining promotions, terminations, performance evaluations, bonuses, or any other organizational resources (Colquitt 2001; Leventhal, Karuza, and Fry 1980). Procedural justice should have the following attributes: accuracy, consistent application of standards or policies, representation from all relevant parties, impartiality, and an appeal process (Leventhal et al. 1980).

The third type of organizational justice is interactional justice, which refers to fairness regarding how an employee is treated by the organization, specifically by his/her supervisor. Interactional justice proposes that an employee's dignity is affirmed when he/she is respected and treated with honesty and truthfulness (Bies and Moag 1986). Interactional injustice occurs when supervisors show disrespect and hostility and withhold important information (Bies and Moag 1986; Reb et al. 2006).

■ Organizational Justice and Strike

Research consistently shows that organizational justice is associated with employee attitudes, motivation, and work behavior (e.g., Adams 1965; Ball, Trevino, and Sims 1993; Colquitt 2001; Greenberg 1990; Hulin 1991; Konovsky and Cropanzano 1991; Skarlicki and Folger 1997). One classic motivation theory that is directly related to distributive justice is the equity theory (Adams 1965). It contends that employees constantly compare the ratio of what they put into a job to what they get from the job with that of the relevant others and feel unfairly treated if they believe they put more into their job but gain less than others (Adams 1965). Employees who feel unfairly treated will be motivated to either seek more benefits from their job or reduce their input into the job in order to restore an equation of fairness in comparison with others (Adams 1965). From an equity theory perspective, a strike may be the ultimate approach that employees can take to fight collectively for their benefits.

Procedural justice is viewed as being more influential on employees' overall justice than is distributive justice. Research shows that employees will respond more positively to distribution decisions (even unfavorable ones) as long as the decision- making procedure is deemed to be fair (Reb et al. 2006). This phenomenon is termed the "fair process effect" (Folger and Greenberg 1985). The importance of fair process is well explained by the control theory (Thibaut and Walker 1975, 1978), which states that a fair process provides a certain level of instrumental control over long-term outcomes on the part of the employee (Shapiro 1993), thereby increasing the predictability of future outcomes (Reb et al. 2006). In contrast, procedural injustice separates the employee from a sense of control over outcome allocations, resulting in uncertainty regarding the future (Van den Bos 2001; Van den Bos and Lind 2002). Since self-determination is a basic human need (Deci and Ryan 1985), people tend to experience frustration and anger when they perceive an inability to affect important decision outcomes (Reb et al. 2006; Van den Bos 2001; Van den Bos and Lind 2002).

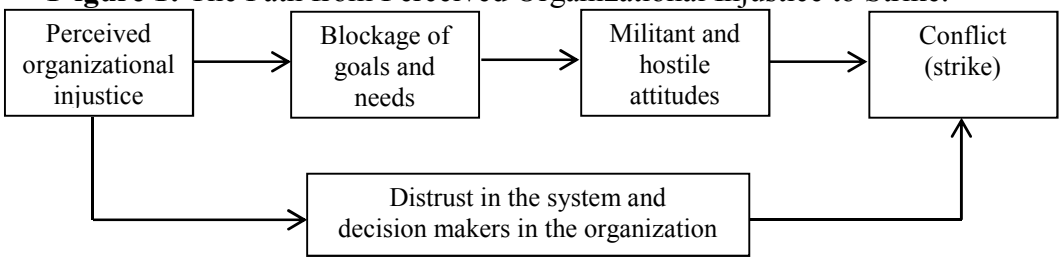
Interactional justice refers to showing respect and being truthful to employees. Interactional injustice is a direct violation of an employee's dignity (Folger and Cropanzano 1998), which is likely to be viewed as a challenge to the norms of moral behavior (Bies and Moag 1986; Colquitt 2001). If one feels unfairly treated interpersonally, he/she will pursue punitive actions against the perpetrator so as to restore moral meaning (Reb et al 2006).

The above discussion shows that all three types of organizational injustice tend to violate basic human needs. Distributive injustice blocks the satisfaction of basic survival needs and (job) security needs (Maslow 1943); procedural injustice blocks the satisfaction of self-determination needs (Deci and Ryan 1985); and interactional justice blocks the satisfaction of esteem needs (Maslow 1943). The "frustration aggression" hypothesis (Dolard et al. 1939) suggests that blockage of needs lead to discontent and hostility. Kelly and Nicholson (1980) offered four different models to describe the causes of strikes: the environmental model, the institutional approach, the sociological approach, and the psychological approach. The psychological approach proposes that blockage of needs, and goals developed relative to needs, will lead to negative and militant attitudes, which eventually will lead to conflict behavior (including a strike).

Organizational justice is an indispensable condition for trust in an organization (Farh, Earley and Lin 1997). Procedural injustice leads to doubts regarding an organization's decision-making system. Interactional injustice causes concerns over the attitudes or ethics of the supervisor and other decision makers. Distributive injustice leads to a lack of confidence in both the system and management in terms of making correct decisions. When workers feel that the system is failing and the decision makers are not trustworthy, they will be more likely to try to take decision-making

power into their own hands through a strike. The theoretical path between organizational injustice and a strike is shown in Figure 1.

F igure 1: The Path from Perceived Organizational Injustice to Strike.



In a study conducted at a nonunion medical electronics factory, Devinatz (2003) demonstrated a close and direct relationship between organizational injustice and a wildcat strike. As Devinatz (2003) found through interviews, the Latina gellers (workers who work at the last stage of the assembly process for the physiological electrodes, a job regarded as the toughest in the factory) had long been discriminated against in terms of employment opportunities at the factory. Compared with people belonging to other ethnic groups, they received less training for highly paid jobs and were more likely to be laid off (Devinatz 2003). The Latina gellers expressed more dissatisfaction with unfair treatment than with poor wages and working conditions (Devinatz 2003). In his conclusion of the causes leading to the strike at the factory, Devinatz (2003) put organizational injustice and widespread disaffection on top of the list.

■China, Organizational Justice, and the Labor Strike

Research conducted in China has repetitively shown that various forms of organizational justice are key factors of organizational outcomes such as organizational citizenship behavior, employee negative emotions and emotional exhaustions, general satisfaction, organizational commitment, employee turnover intention, and work performance (Frenkel, Li and Restubog 2012; Leung, Wang and Smith 2001; Wang, Liao, Xia and Chang 2010; Zhang and Agarwal 2009).

In the following case study, we will examine the three different types of organizational justice and how they collectively led to a strike in a subsidiary of a global company in China.

METHODOLOGY

■Study Site

The study was conducted at a subsidiary of a global corporation in an industrial city in China. The subsidiary company was once a successful collective enterprise that manufactures home appliances. In 1995, a joint venture was established with investments from the collective enterprise and the global corporation. The joint venture was unable to achieve profitability since the very beginning. During the same period, the collective enterprise encountered a serious business setback and could not afford a joint venture that had huge losses every year. After the collective enterprise sold its share of the joint venture to its venture partner, the company became a wholly owned subsidiary of the global corporation in 2002. At this point, the majority of the company's full-time employees were originally hired by the collective enterprise. However, over the subsequent years, the company gradually replaced them with contract migrant workers from rural China at a much lower wage rate. The strike in this study happened in 2005 and the principle author visited the company about 7 months later after the strike.

■Research Procedure

Fifteen interviews were conducted with the company's president, factory managers, leaders of the company's ACFTU branch, HR supervisor, production managers, frontline supervisors, and more than 10 frontline workers. Most of the interviews were conducted in private; however, some of the frontline workers were interviewed in groups at their request. The interview with the company president lasted for more than 2 hours. The interviews with other company managers lasted for about an hour.

The frontline workers participating in the interviews worked on assembly lines. They were allowed to take time off from their job to attend the study because 1) the frontline managers were initially quite supportive of the research project at the request and encouragement of the company president, and 2) the company was waiting for certain production materials to arrive. These workers were from two production sections. The contact person of the study, the factory's HR supervisor, provided the principle author with two lists of frontline workers from the two production sections. The principle author randomly selected around three−four workers from each production section for private interviews. Aside from the individual interviews, many workers volunteered for an informal interview when they learned that the principle author was conducting research there. Some of them invited the principle author for additional discussions in their workers' lounge. The principle author went to the workers' lounge and had an informal talk with five workers (joined by two more workers later).

The interviews with frontline workers lasted from 15 to 30 minutes. The interview time for workers was short due to the fact that they could not leave their assembly lines for too long, they had limited time for lunch, and they had to leave the workplace immediately after the workday in order to catch the company's shuttle bus. The process of interview with frontline workers was cut short by the HR supervisor, the initial contact for the study. The reason given was that the company had received the production materials and the workers had to resume their original work schedule.

Since the principle author is a native Chinese speaker, all the interviews were conducted in Chinese. The interview with the company president was recorded on tape and was later transcribed in Chinese. The other interviews were not recorded because the interviewees expressed confidentiality concerns. Interview notes were taken in Chinese for those interviews.

FINDINGS

In 2005, about 200 of the company's employees staged a 3-day strike. Most of the participants were full-time employees who were originally with the collective enterprise. The workers requested 1) employment contracts with no fixed term, 2) elimination of a new policy regarding sick leave, 3) an apology from management for assaults committed by the human resources (HR) director against five workers as well as a punishment of the HR director. Because the strike was not organized by ACFTU, the police entered the company to control the situation. Management neither apologized for the HR director's behavior nor did they give a clear response regarding the issue of contract term. Rather, it used the political tactic of "divide and conquer." They asked the Communist Party Secretary of the company branch to take away the Communist members participating in the strike, the head of the company's branch of the ACFTU to take away the key ACFTU members, and the middle-level managers to take away superior job performers.

The strike ended with no immediate reconciliation from management. However, management did promise to 1) temporary delay the execution of the new sick leave policy, 2) seek approval from the workers' congress for any major decisions in the future, 3) hand over the HR director's case to the police, and 4) strictly follow the relevant state laws regarding the length of employment contracts. Months later, the HR director was let go for another reason. At the time of the study (7 months after the strike), the principle author was told by the company president that 80 veteran workers, mostly strike participants, would leave the company under the schemes of early retirement, voluntary resignation, or retirement due to illness. Within a year after the study was conducted, the principle author was informed that the general manager of the factory and the company president left the company. Three years later, the parental global company announced to close this subsidiary company and eliminate 600 jobs.

■Distributive Injustice

The interview results showed that the workers were not satisfied with their pay, fringe benefits, and job security. Based on information received from management and the workers, the average pre-tax monthly salary of a frontline worker was 2000 Yuan (close to 300 USD). Management claimed that this salary level was better than many companies in the same industry zone. However, the workers claimed that their post-tax income was about the same as what they earned 10 years ago, when the company was still a collective enterprise. Taking inflation into consideration, their actual salary was less than their salary of 10 years ago. One frontline supervisor confirmed that the total salary increase for the frontline workers was around 100 Yuan (about 15 USD) in 10 years. The gap between the workers' pay expectations and their actual pay was exaggerated by the parent company's CEO's promise of a 10% annual salary increase at the opening ceremony when the company became a subsidiary of the global parent corporation.

The frontline workers interviewed also complained that, over the years, their workload had doubled. The workers felt they were not fairly treated by comparing their present pay with past compensation, given the fact that they input more into their job but gain less from it. The workers also complained that office employees made much more money than they did and the office working conditions were much better than theirs. The principle author toured the work areas for workers and office employees. The office area was air-conditioned, supplied with purified drinking water, and had better supplies in the restroom. The workers' area, on the other hand, was only supplied with fans (the place turned out to be very hot during the summer when the study was conducted) and was very noisy and crowded. The workers were only supplied with boiled tap water and there were no necessary supplies (soap and toilet paper) in the restroom. Moreover, the workers had to wear different colored uniforms to represent their assigned section in the assembly line. Some workers felt humiliated by the uniform (as if they were part of a machine) and some complained that the fabric was very poor in disseminating heat.

The workers' perception of distributive injustice was also enhanced by the fact that the president of the company and other middle-level managers were paid tens of times beyond what they made. As previously mentioned, under the pre-1978 socialist ideology, the workers had been regarded as the enterprise's owners. The wage difference between managers and frontline workers

at that time was very minimal (about twice as much). The workers complained that they were not owners anymore. Instead, they found themselves at the bottom of the organizational structure, receiving the lowest pay, working under the poorest conditions, and producing the most (they believed their efforts, rather than those of office employees, were what generated revenues).

The company president attributed the workers' low wages to the poor financial performance of the company over the previous 10 years. He said that the parent global company was applying a self-sufficiency policy, meaning that each region is responsible for its own financial condition. The company had made some mistakes in product development and failed to meet the needs of the local customers. In addition, the lack of a standard product inspection system and accounting system created numerous problems with quality control and cash flow, resulting in 10 consecutive unprofitable years. As a result, the president said he had no other choice but to cut costs wherever possible and to demand a high production volume. This probably explains why the workers did not make a request for higher wages in their strike. However, workers' perception of unfair pay contributes to their dissatisfaction and distrust with the management in the first place.

■ **Procedural Justice**

One of the important reasons the workers went on strike was that they received news that the company would not sign employment contracts with no fixed term. The labor law in China prescribes that any worker with 10 or more service years has the right to sign an employment contract that is not limited in terms of length of the agreement. Many workers mistakenly viewed an employment contract with no fixed term as a guarantee of life-long employment and believed that their service in excess of 10 years should guarantee them that type of contract. Once they heard that the company refused to sign such a contract, they felt that the law was not being properly applied and they were not treated fairly by the company.

The workers' perceptions of procedural injustice also arose from the fact that their concerns and requests were not addressed by either the management or the union. The company had a branch of the ACFTU. However, as in other offices of the ACFTU, the company union played a minimal role in the company's decision-making process. The interviewees claimed that the union did not do anything to support the workers' requests and protect the workers' interests. Some workers said that they were not aware of what the union normally did and they were not used to seeking help from the union. They complained that there was no channel available in the company for them to communicate their requests to top management. Some workers mentioned that they reported problems to the supervisor in the past, but they had never received a response.

As previously mentioned, representation of the interests of all parties and the availability of an appeal process are attributes of procedural justice (Leventhal et al., 1980). In this company, workers' interests were not truly represented by any party involved in the decision-making process, and there was no appeal channel that could address any decision-making mistakes. The result was a sense of procedural injustice among the workers.

■ **Interactional Justice**

All of the people interviewed confirmed that the event that directly triggered the strike was a physical conflict between the company's HR director and five frontline workers. The incident began when the company's new sick leave policy was being enforced. The new policy required workers on sick leave to present their medical records and an excuse note from a doctor to the HR office in person. That particular day, four "long-term sick leavers" were called upon by the HR director to discuss their cases in his office, whereupon a series of verbal and physical confrontations ensued. Those workers plus another worker who happened to be in the HR office for some other purposes claimed that they got injured in the confrontations. According to the company president, the HR director viewed those four long-term sick leavers as intentional troublemakers. He called them hoodlums and said that he would handle them like hoodlums. He announced that the company would never sign an employment contract without a term limit with them or anyone else who had been employees in the company from the days of the collective enterprise. The four workers spread the news to the rest of the workers. Intense anger was immediately stirred up among the workers, especially those from the era of the collective enterprise. About 200 workers gathered in the dining hall. They demanded an apology from management for the insulting and physically abusive behavior of the HR director, legal action against the HR director, and signed employment contracts without limits as to the term of employment. The incident demonstrated a clear violation of the workers' dignity, leaving them humiliated and insulted. It was an obvious evidence of interactional injustice.

■ **Organizational Injustice, Trust and the Strike**

As previously mentioned, all the people interviewed agreed that the conflict between the HR director and the workers was the direct cause of the strike. The president was able to expound on the reason in more depth:

"Workers want to sign a labor contract with no time limit. In addition, the hidden antagonism between the workers and management that has accumulated over the years broke out at that moment.

The new and old hatred toward management due to the rough treatment they have received from management in the past was all expressed at the moment."

The anger ran so high that, even after the strike was over, the president was stopped and attacked by some workers and his clothes were torn off in the physical melee.

The principle author could still sense the workers' anger at the time of the interviews, about 7 months after the strike. Many of them expressed complete distrust in the company's management. Many workers got the wrong impression that the principle author was sent by the headquarters of the parent global corporation to do an investigation. During the interviews, they kept on requesting the principle author to report what had happened to the headquarters. The workers said that, when it first became a joint venture and then a subsidiary of the global corporation, they were very confident in the company's future. Then, they noticed that the company's management was chaotic (i.e., orders by the supervisor were often overruled by the manager), that workers were not valued, and that workers felt no honor as an employee. They gradually lost their work motivation. Many workers expressed their desire for early retirement although they were still in their forties and early fifties.

DISCUSSION

This case study provides evidence that organizational injustice will lead to a feeling that needs and goals are being blocked, which will likely produce a militant attitude among workers toward the company and its management. At the same time, perceptions of distributive, procedural, and interactional injustice will create distrust among the workers toward the organization's management system and personnel. A distrust of the system, along with a militant attitude, may compel workers to take extreme actions, including staging a strike.

Research shows that organizational injustice may result in responses from employees such as employee theft (Greenberg 1993a), lawsuits (Goldman 2001), and reduced organizational citizenship behaviors (Organ and Moorman 1993). These responses are all individual responses. A strike is a collective response to an organizational injustice and therefore is potentially more damaging than individual responses to an organization's morale, reputation, or finances. The reasons why, in this case, organizational injustice led to a collective strike, rather than a series of individual responses, could be the following:

- **Cohesive relationships among the workers**

  Most of the workers on strike began working in the company when it was still a collective enterprise. They had been co-workers for more than 10 years and had together experienced the different development stages of the company, from a collective enterprise to a joint venture and eventually to a subsidiary of a global company. They were bonded not only by their job but also by memories, work group norms, and culture.

- **Lack of legitimate channel to air workers' dissatisfaction**

  At this stage in China, ordinary workers essentially have no channels to make their voice heard. The company had no official channel for appealing grievances and the union was more interested in promoting work motivation and productivity than solving workers' problems. The workers may have believed that the only solution available to make their voice heard was to go on strike.

- **Management's poor interactional skills**

  The strike in this study was directly started by the poor interactional behavior of the HR director. His lack of respect for not only the workers in his office but also the rest of the veteran workers stirred up anger, which eventually resulted in collective action. A common saying in China is "more people, more power." Managers should be very careful whenever they comment on a group in China. An insult targeted at a group of workers could lead to a serious response.

- **Management's poor use of explanations**

  Shaw and his colleagues (Shaw, Wild, and Colquitt 2003) discussed how explanations offered by management could reduce the negative effects of organizational injustice, leading to more cooperative responses and less retaliatory and withdrawal responses from employees. They identified two types of explanations, excuses and justifications. Excuses are explanations in which the decision maker admits that the act in question is unfair but cites external causes as excuses. Justifications are explanations in which the decision maker denies any inappropriateness regarding the act in question (Shaw et al. 2003).

  During our research, we got the distinct impression that communication between the workers and management was extremely limited. Both management and the workers clearly expressed their distrust in the other. When the conflict happened between the HR director and the workers, the company's president decided to support the HR director. He said during the interview:

  "(We) could not apologize for (what the HR director did). How could we apologize for it? These four workers tried to stir up emotions (among the workers) by demanding punishment of the assailant. The HR director did make wrong comments. (But) you could not back off. Management could not back off. If management showed weakness, it would be hard for it to handle disputes in

the future… It would be disastrous if you back off. It would become a domino crisis. Of course, they (workers) were angry with how I handled the incident. I could do nothing about it. The price (of doing so) would be hatred implanted in the workers…"

Apparently, the company had never thought of making any explanations regarding the incidents that triggered the strike. As a result, distrust and anger grew, eventually leading to a strike.

RESEARCH LIMITATIONS

First, the interviews were conducted about 7 months after the strike. The central figure of the whole event, the HR director, had left the company and was no longer available for the interview. Therefore, the information collected might not be as comprehensive as it could have been if the interviews had been conducted at the time of the strike.

Another limitation of this study is that the interviews were forced to end prematurely. More detailed information could possibly have been obtained if the principle author could have interviewed more workers as scheduled. Moreover, the general manager of the factory postponed an interview with the principle author several times and eventually canceled it. Some additional facts regarding the strike might have been gathered had there been continued cooperation from the general manager of the factory. However, overall, the principle author was able to interview representatives of all the important parties involved in the strike, especially the president of the company who was the major figure in ending the strike.

The third limitation is that some of the interviews were conducted in groups. As mentioned early in this study, interviews were originally planned to be conducted with selected individual employees. Once workers heard that the principle author was doing research in the plant. They mistakenly thought her to be a representative from the headquarter of the parent company, and therefore volunteered to chat with her in groups. Experts on qualitative research identified several potential problems on group interview. For example, a group interview could be dominated by one or two people (Robson 1993), which may bias the overall group opinions (Stewart, Shamdasani and Rook 2007); people will feel uncomfortable discussing issues with other people (Morgan 2007). However, since workers voluntarily participated in the group interview in this case, we believe they had no problem expressing their opinions.

CONCLUSION

China is still undergoing the biggest reform of an economic system in history. With the end of the "iron wage" and "iron rice bowl" and the introduction of a monopoly of management power, the unequal distribution of income and other types of social wealth will become an unavoidable trend. As distributive injustice increases, management needs to be even more attentive to and skillful in delivering procedural justice and interactional justice. Companies should keep communication lines between management and workers open. Unions should show more concern toward workers' needs and stand up for workers against management, when necessary. Managers should show respect for workers, truly see them as the company's valuable assets, and care about their well-being. Only by doing so can management keep the company under control and prevent strikes from occurring.

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Leadership Characteristics, LMX Currencies, Perceived Supervision, And Subordinate Behavior in Taiwan

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ABSTRACT

Relying on the prominent leadership theories, we examine the extent to which leadership characteristics -- traits, roles, and styles -- can influence LMX currencies and the reciprocal effect of LMX on leadership characteristics. We also test the impact of leadership and LMX on perceived supervision that forms subordinate behavior. Results indicate that leadership characteristics play an important role in shaping LMX currencies that managers must know for leadership effectiveness. LMX currencies have a stronger reciprocal effect on leadership. Leadership and LMX have significant effect on subordinate perceptions of supervision, and the latter has a strong impact on subordinate feelings and behavior measured by such variables as satisfaction with supervision, inspiration, and decision to stay. The main finding is that the dynamics of leadership characteristics change the nature of leader-member exchange, member perceptions of supervision, and subordinate behavior.

INTRODUCTION

The leader-member exchange (LMX) theory (Dansereau, Graen, & Haga, 1975; Dienesch & Liden, 1986; Scandura, Graen, & Novak, 1986; Liden & Maslyn, 1998; Dunegan, Uhl-Bien, & Duchon, 2002; Erdogan & Enders, 2007) explains how quality leader-subordinate relationships affect employee perceptions of their supervisors. LMX theory suggests that the quality of a leader-member dyadic reciprocal relationship (Uhl-Bien & Maslyn, 2003) predicts positive organizational outcomes (Burns & Otte, 1999). Leader-member exchange takes place through interactions among leader and member characteristics.

The present study has analyzed the effect of leadership characteristics, defined as leadership traits, roles, and styles, on LMX currencies – *affect, loyalty, contribution,* and *professional respect* -- and the reciprocal impact of LMX currencies on leadership characteristics as well as the effect of LMX and leadership characteristics on perceived supervision, and finally the impact of the latter on subordinate feelings and behavior in the "LMX, leadership characteristics, perceived supervision, and subordinate behavior linkage model." It appears that previous studies in the field have not considered this linkage among leadership constructs.

First, we test the effect of leadership characteristics on LMX currencies. Leadership characteristics -- traits (McGregor, 1960; Lord, De Vader, & Alliger, 1986; Belasen & Frank, 2008), roles (McGregor, 1960; Mintzberg, 1973) and styles (McGregor, 1960; Yu & Miller, 2005; Kao & Kao, 2007) are enacted through a leader's behavior towards his or her followers. Traits are distinctive characteristics of a leader that in combination represent the leader's personality. A leader's personality (Zhang, Wang, & Shi, 2012) determines the patterns of his or her behavior that contribute to leader-follower relations. Positive leadership traits may produce affection (Dienesch & Liden, 1986), mutual liking, between the leader and member that may help develop loyalty to one another. Loyalty motivates members to contribute to the success of the leader. Professional respect (Liden & Maslyn, 1998), as pride in the leader's expertise and competence, may contribute to the affection and loyalty. Leadership roles are dominant classes of behavioral activities that managers or other followers perform (Lussier & Achua, 2004). Main leadership roles that involve LMX are hiring, training, giving instructions, coaching, mentoring, and evaluating performance. If the leader is successful in performing these roles, both leaders and members develop affection and loyalty that influence member behavior to contribute more. Leadership styles are a leader's behavior that enacts leadership traits and roles in interaction with subordinates. Only enacted traits and roles through leadership styles influence leader-member exchange, specifically, produce mutual affection and loyalty. Consequently, loyal members are motivated to contribute to their supervisors' success.

Second, we examine the reciprocal impact of LMX currencies on leadership characteristics. Affect and loyalty change a leader's traits in ways that strengthen sensitivity to others (Zaccaro, Foti, & Kenny, 1991), agreeableness (Judge, Heller, & Mount, 2002), flexibility (Zaccaro, Foti, & Kenny, 1991), self-confidence (House & Baetz, 1979), and other aspects of leadership traits. Based on these changes, a leader may modify his or her roles, focusing more on training, mentoring, and preparing followers for major reviews and appraisals that are so important for subordinates' job security and professional growth. Styles change in the direction of transformational leadership (Podsakoff, Mackenzie, Moorman, & Fetter, 1990) because of mutual leader-member understanding and strong support by followers. The willingness of members to contribute to the leader's success beyond their job descriptions also changes the leader's behavior. He or she can firmly rely on subordinates' self-awareness and self-regulation (Turner, 1987). Professional respect increases the leader's self-confidence (House & Baetz, 1979).

Third, we analyze the degree to which leadership characteristics and LMX currencies influence perceived supervision. Each of the leadership characteristics and LMX currencies differently modify member perceptions of supervision. Mutual affection (Dienesch & Liden, 1986) may be the most important factor for the perception of supervision as good leadership. Loyal organizational members (Scandura, Graen & Novak, 1986) always perceive supervision as good leadership. If employees are willing to contribute extra effort to their leader's success (Liden & Maslyn, 1998), they perceive supervision as good. Whoever respects a supervisor for his or her professional qualities (Liden & Maslyn, 1998) perceives the supervisor as a good leader. If a supervisor demonstrates good leadership traits (Belasen & Frank, 2008), and performs his or her roles (Mintzberg, 1973) as members expect and employs styles (McGregor, 1960) that treat subordinates with dignity and inspires them to aim for high performance (McGregor, 1972), members perceive the supervisor as a good leader. Our task is not only to determine if the leadership characteristics and LMX currencies have a significant impact on members' perceptions of supervision, but also to determine which ones have stronger or weaker impact on those perceptions in terms of practical implications for managers.

Fourth, the perceived good supervision is assumed to have positive impact on feelings and member behavior. Specifically, subordinates should be satisfied with supervision (Mardanov, Maertz, & Sterrett, 2008), their individual performance (McGregor, 1972) improves, and they work with inspiration (Podsakoff et al., 1990) and decide to stay with the organization (Maertz & Campion, 2004). The impact of perceived supervision on subordinate behavior can be examined in three ways. First, the manifest variables *satisfactions with supervision, performance, decision to stay, and working inspired* may measure a latent variable *subordinate behavior* which is tested against perceived supervision. Second, the latent variables *leadership characteristics* and *LMX currencies* can be related to these manifest behavioral variables to find out which of the latent variables have strong impact on them. Third, the latent variable *perceived supervision* can be related to *satisfaction with supervision, performance,* inspiration, and *decision to stay*. We decided to examine the first relationship and not to examine the named manifest variables against leadership characteristics and LMX currencies as well as perceived supervision in this study because they represent single-items.

Thus, our research questions are (1) whether leadership characteristics -- traits, roles, and styles -- determine LMX currencies -- *affect loyalty, contribution,* and *professional respect*; (2) if LMX currencies have significant reverse effect on leadership characteristics; (3) whether leadership characteristics and LMX currencies define perceived supervision; and (4) if perceived supervision modifies subordinate behavior. Our goal is to demonstrate more convincingly the bond among leadership characteristics, LMX, perceived supervision, and subordinate behavior.

THEORY AND HYPOTHESES

The well-known terms leadership traits, roles, and styles we conceptualize as leadership characteristics. Research has created a full list of leadership traits (House & Aditya, 1997). Leadership traits are a manger's qualities and distinguished personal characteristics or personality (Lussier & Achua, 2004). Many of the leadership personality traits can be perceived by subordinates as related to their relationship with their supervisor. The first traits clearly perceived by subordinates are integrity (Cox & Cooper, 1989), ethical leadership, and trustworthiness. Another important trait is sensitivity to others (Zaccaro, Foti, & Kenny, 1991). Other traits are self-confidence (House & Baetz, 1979), internal locus of control (Avotio & Hovell, 1992), stability (Bass, 1985), and leadership attitudes toward subordinates (McGregor, 1960).

The leader's role, according to Mintzberg (1973) is to perform the management functions to effectively operate the manager's organization unit. Among leader roles are hiring and training, giving instructions and coaching, and evaluating performance (Lussier & Achua, 2004). The supervisor's main role is to focus on high organizational performance and encourage subordinates to achieve high performance standards (McGregor, 1972) and provide guidance for major reviews of employee work performance (Bass, 1985; Conger & Kanungo, 1987). Good leaders are able to manage employee emotions in social relationships (Lawler, 2001), effectively dealing with stress management, conflict resolution, and workplace bullying. Such supervisors activate positive psychological states to achieve self-awareness and positive self-regulation (Turner, 1987; House, Spangler, & Woycke, 1991).

The literature refers to leadership style as a combination of traits, skills, and behaviors leaders use as they interact with followers (Lussier & Achua, 2004). To be more precise, leadership styles are the patterns of managerial behavior and actions which are formed under the influence of leadership traits and roles. Subordinates observe and perceive managerial styles in terms of how leaders interact with them and with coworkers. A leader's styles reflect the leader's behavior toward others that shapes leader-member exchange. Theory X and Theory Y explain the leader's two sets of attitudes toward self (McGregor, 1960) that are reflected by leadership styles. In the Theory Y self-concept, the leader typically gives and accepts positive feedback, expects others to succeed, and lets others do the job their way. In the Theory X self-concept, the leader typically is bossy, pushy, and impatient, does much criticizing with little praising, and is very autocratic (Hughes, Ginnett, & Curphy, 1999). Consistent

with Theory Y, supervisors allow the group to take responsibility for task decisions, emphasize shared ideas and participative decisions, explain task decisions in a supportive and persuasive way, facilitate group discussion to make a decision, inspire and facilitate extraordinary effort and performance, and always assume that people are willing to work, accept responsibility, and are self-directive and creative (McGregor, 1960).

The leadership characteristics -- traits, roles, and styles -- actively shape leader-member relations. Member characteristics also contribute to these relations. However, leadership should have a dominant impact on leader-member exchange because leadership roles are formed by organizational goals and corporate strategies which require certain leadership traits and styles. High quality leadership, as measured by constructs introduced by various leadership theories, specifically Theory Y (McGregor, 1960) and Theory Z (Ouchi & Price), produce high quality LMX.

The pioneers of the LMX theory (Dansereau, Graen, & Haga, 1975; Graen & Scandura, 1987) have said that leader-member exchange occurs as vertical dyadic interrelations. Dienesch and Liden (1986) introduced three currencies of LMX – *affect, loyalty* and *contribution*.

Affect is defined as the mutual affection members of the dyad have for each other based primarily on interpersonal attraction rather than work or professional values (Dienesch & Liden, 1986). *Loyalty* was defined as the extent to which both leader and member publicly support each other's actions and character. Finally, *contribution* was defined as the perception of the amount, direction, and quality of work-oriented activity each member puts forth toward the mutual goals (explicit or implicit) of the dyad. *Professional respect* was defined by Liden and Maslyn (1998) as the perception of the degree to which each member of the dyad had built a reputation, within and/or outside the organization, of excelling at his or her line of work.

In dyadic exchanges, leaders enact their leadership traits, roles, and styles, and organizational members enact their personality traits, task roles, and follower styles. Leaders are responsible for forming follower attitudes and behavior desired by the organization through LMX. Therefore, we may assume that not one, but all leadership characteristics -- traits, roles, and styles -- proactively influence LMX currencies -- *affect, loyalty, contribution,* and *professional respect*. Leadership characteristics as determinants will significantly correlate with LMX currencies and explain a significant variance. Reciprocally, LMX currencies can explain some or even more variance in leadership characteristics. However, first, leadership characteristics determine LMX, and, second, LMX forms a new state of leader-member relations, and that reshapes leadership characteristics in a cyclical pattern.

Thus, leadership characteristics determine LMX, LMX reciprocally reshapes leadership characteristics, both influence member perceptions of supervision (Dansereau, Graen, & Haga, 1975), and the latter determines the subordinate behavior. Interrelations among these factors we call "The Linkage Model of LMX, Leadership Characteristics, Perceived Supervision, and Subordinate Behavior."

■Leadership Characteristics and LMX (Hypothesis 1)

Leadership characteristics -- traits, roles, and styles -- determine LMX currencies -- *affect, loyalty, contribution,* and *professional respect* -- because leadership is conducted through vertical dyadic linkage (Dansereau, Graen, & Haga, 1975) in leader-member exchange (Dienesch & Liden, 1986). Leadership characteristics should correlate with one another because leaders' traits contribute to how they play their roles and use their styles. Meanwhile, leadership roles and styles may change leadership traits because leadership roles and styles always change under the influence of employee and organizational factors (resources, strategies, and policies) and market competition.

A leader's traits rest on the leader's personality, specifically conscientiousness and agreeableness impacted employees' perceptions of LMX (Bernerth, Armenakis, Field, Giles, & Walker, 2007). A leader's traits also rest on the leader's other attributes: physical, emotional, social, intellectual/intelligence, experience, trustworthiness (American Library Association, 2013). A leader is also ethical, honest, credible, and consistent in putting values into action, and able to activate positive psychological states to achieve self-awareness and positive self-regulation (Luthans, 2002). The supervisor manages subordinate emotions in social relationships and assumes that people are willing to work, accept responsibility, are self-directive, and are creative (McGregor, 1960). Such a leader is likely to be likable, a friend to subordinates, and is a lot of fun to work with (Liden & Maslyn, 1998). He or she is wise, loyal to subordinates, and have followers who are readily available to contribute to their success. Therefore, leadership traits by definition must be the determinants of leader-member exchange because the leaders' behavior is based on their traits.

Leadership roles are formed under the influence of structural arrangements, functional responsibilities, and symbolic interactionism (Winkler, 2010). Other individuals or structures send roles to superiors or colleagues. People who hold different positions perform functions required by the system (the organization). The roles within a group emerge through interaction, i.e., the roles will be developed and negotiated via active participation of the individual (Seers, 1989). Leaders' roles that are closely perceived by followers are seen in encouraging followers toward high performance standards, guiding them for major reviews of work performance, helping followers achieve a high level of performance (Bass, 1985; Kouzes & Posner, 1999), and provide job security.

Consequently, successful role execution by the leader develops affect in followers, they become loyal to the supervisor, and supervisors become loyal to subordinates, and loyal followers will be willing to contribute beyond their job descriptions (Liden & Maslyn, 1998).

Various leadership styles were identified and are used depending on the situation: visionary, coaching, affiliative, democratic, pacesetting, and commanding (Goleman, McKee, & Boyatzis, 2002). These leadership styles should help leaders earn members' *affect, loyalty*, and *professional respect*. Allowing the group to take responsibility for task decisions (Bell & Bodie, 2012), emphasizing shared ideas and participative decisions (Russ, 2011; Black & Gregersen, 1997), and facilitating group discussions to make a decision (Larson, Sargis, & Bauman, 2004) change member attitudes and behavior to contribute to the leader's success. People- and relationship-oriented or employee-centered leaders (Likert, 1961) employ a democratic style (Gastil,1994), and explain task directions in a supportive and persuasive way. Such leaders are inspirational and put forth extraordinary effort to achieve a high level of performance. If supervisors employ these leadership styles, leaders and members develop mutual affection and loyalty to each other. Mutual affection and leader loyalty encourage extraordinary enthusiasm in members to contribute.

Hypothesis 1: Some l*eadership characteristics -- traits, roles, and styles -- have stronger impact on the LMX currencies -- affect, loyalty, contribution, and professional respect -- than others to be considered by managers.*

■LMX and Leadership Characteristics (Hypothesis 2)

LMX currencies have reciprocal impact on leadership traits, roles, and styles because the new state of leader-member relations requires leaders to change their traits, roles, and styles in new conditions. The patterns of LMX that produce positive work-life outcomes (Dunegan, Uhl-Bien, & Duchon, 2002; Greguras, & Ford, 2006; Harris, Harris, & Eplion, 2007) should be sustained by making adjustments in leadership traits, roles, and styles. For instance, mutual affection changes the leader's style, roles, and even traits because leader-member relations achieve a new quality. Mutual liking and friendly and comfortable work relations (Uhl-Bien & Maslyn, 2003) motivate both leaders and members to improve their traits, roles, and styles that ultimately help achieve a higher level of task and organizational performance (Bass, 1985). The leader with Theory X-attitude may become a leader with Theory Y-attitude (McGregor, 1960) because of mutual affection. Such a leader mentors followers, encourages team building and high performance standards, and rewards successful subordinates. In addition, the leader trusts followers in task decisions and performance. In terms of traits, the leader strives for ethical and honest business conduct and inspires followers to be "good" and "right." In terms of styles, the leader assumes that people are willing to work, accept responsibility, and are self-directive and creative (McGregor, 1960). Therefore, the leader delegates the group authority for electing their team leaders, and making task decisions, shares ideas, makes participative decisions, and facilitates group discussions to make decisions.

Likewise, *loyalty* influences leadership characteristics. Leaders who are going to be loyal to followers have to change their traits to be sensitive to others (Zaccaro, Fori, & Kenny, 1991). Their roles are not only to allocate tasks and monitor and control task performance, but also inspire, encourage, and reward subordinates to strive for higher performance standards (Janssen, & Van Yperen, 2004). *Contribution,* as an additional effort of some members, should have significant effect on the leadership characteristics. However, excessive contribution may not be necessary in many organizations and may lead to overproduction in manufacturing or excessive service. In Southeast Asia, individual contribution in many cases is not encouraged and appraised (Kao & Kao, 2007) by leaders. Instead, group contribution is preferred. *Professional respect* impacts leadership characteristics because leaders' expertise, competence, and technical, interpersonal, and communications skills change leader-member relations, and therefore leadership traits, roles, and styles should be adjusted.

Hypothesis 2:LMX currencies -- affect, loyalty, contribution, and professional respect-- will be reciprocally positively related to leadership characteristics -- traits, roles, and styles.

■Leadership Characteristics, LMX, and Perceived Supervision (Hypothesis 3)

In leader-member relations, leadership traits, roles, and styles are enacted, and organizational members are able to reach conclusions about what kind of leader they have. Member perceptions of supervision (Scandura & Graen, 1984; Liden & Maslyn, 1998; Mardanov, Maertz, & Sterrett, 2008) depend on how supervisors behave in putting into action their leadership traits and roles through their leadership styles as well as how other employees behave reciprocating the leader's behavior.

An organizational member may develop good personal relationships with the supervisor and both may like each other and have fun working together. They can develop friendship and interact outside of work settings, visit each other, and hang out together at social gatherings and privately. In some organizations in the West, this may happen less often, but in countries with the collectivist national culture, this is a common relationship. If leaders and members have mutual affection (Dienesch & Liden, 1986), they are able to develop loyalty to one another. Supervisors defend subordinates to others in the organization if they made honest mistakes. They may defend loyal subordinates to a superior, even without complete knowledge of the issue in question, and

supervisors would defend a subordinate if he or she were "attacked" by others (Dienesch & Liden, 1986). Leader loyalty to members is perceived by subordinates as good supervision. The readiness of a follower to contribute to the supervisor's success is an important indication of positively perceived supervision.

If the supervisor demonstrates positive traits: sensitive to people, competent, charismatic, honest, credible, accountable, flexible, consistent in putting values into action, and is able to stimulate self-awareness and self-regulation, then subordinates perceive the supervisor's leadership positively. If the supervisor plays his or her leadership roles well to mentor newcomers, explain task directions in a supportive and persuasive way, encourage high performance standards, help followers improve their performance, manage follower emotions in social relationships, and provide subordinates with guidelines for major reviews of their work performance, followers perceive his or her leadership positively. Allowing groups to take responsibility for task decisions, making participative decisions, facilitating group discussions and decisions, and using democratic (Gastil,1994) and subordinate-centered leadership styles portray supervisors as good leaders in the perceptions of subordinates. Thus, leadership characteristics – traits, roles, and styles -- and LMX currencies – *affect, loyalty, contribution,* and *professional respect* – together shape subordinate perceptions of supervision.

Hypothesis 3:Leadership characteristics (traits, roles, and styles) and LMX currencies (affect, loyalty, contribution, and professional respect) will be positively related to perceived supervision.

■ **Perceived Supervision and Subordinate Behavior (Hypothesis 4)**

Leader behavior affects member behavior. Organizational members' perceptions of supervision have practical consequences. They may be satisfied with supervision (Liden & Maslyn, 1998; Mardanov, Maertz, & Sterrett, 2008) or dissatisfied; inspired or discouraged; perform well or perform poorly (McGregor, 1972); and decide to stay or leave the organization (Maertz, & Campioon, 2004). *Affect* and *loyalty* trigger subordinate inspiration to contribute more to the success of the supervisor/group/organization. Subordinates may be willing to work for their supervisor with inspiration that goes beyond what is specified in their job descriptions, subordinates may put forth extra effort, beyond that normally required, and work their hardest to meet the supervisor's work goals (Dienesch & Liden, 1986; Liden & Maslyn, 1998). In this environment, members are willing to stay with the organization rather than to quit (Maertz & Grigffeth, 2004).

Hypothesis 4: Perceived good leadership will be positively related to subordinate feelings and behavior associated with satisfaction with supervision, performance, decision to stay, and inspiration.

METHODS

In the pre-test, using student data (N = 233) from one of the American universities, we were able to test the reliability of the LMX-MD (multidimensionality) scale (Liden & Maslyn, 1998) and the scale we have developed based on the leadership trait, role, and style theories (Lussier & Achua, 2004). The results indicate that the overall scale (alpha = .932), LMX-MD scale (alpha = .915) and leadership characteristics (traits, roles, and styles) scale (alpha = .928) were strongly reliable. Therefore, we decided continue our research in the real economy.

In the post-test, using industrial data (N = 272), we also used the LMX-MD survey instrument (Liden & Maslyn, 1998; Greguras, & Ford, 2006) which consists of four currencies with three items in each. As expected, twelve items loaded on four leadership currencies, confirming the LMX-MD (Appendix A). We used the original questionnaire used in the pre-test for leadership characteristics, consisting of 18 items. Exploratory factor analysis helped select out items with weak loadings (less than .7) on the designated three factors: leadership traits, roles, and styles. Only ten items loaded appropriately on these factors: four on leadership traits, three on leadership roles, and three on leadership styles (Appendix A). The items that had heavy loadings on leadership traits, roles, and styles are usually easily perceived by subordinates. Further, the explored factors were used in confirmatory factor analysis of model fit, construct validation, and structural equation modeling for hypotheses testing. In the seven-point Likert-type scale, seven was strongly agree; six, agree; five, somewhat agree; four, neither agree nor disagree; three, somewhat disagree; two, disagree; and one, strongly disagree.

■ **Sample**

Data for the post-test were collected from randomly selected individuals employed in the Taiwanese construction industry. They were informed about the purpose of the survey and asked if they wanted to participate in the survey. The respondents were notified that the survey would be anonymous, voluntary, and confidential. Respondents were asked to reveal their perceptions of their managers' leadership traits, roles, and styles as well as their *affect, loyalty, contribution, and professional respect* perceptions in leader-member exchange. To those who agreed to participate, we provided a survey questionnaire translated into the Mandarin language. Among 272 respondents,

168 were male and 104 female, and their age ranged from 18 to 64: forty-four respondents were 18-24 years old; one hundred two – 25-34; eighty-one – 35-44; thirty-seven – 45-54; and eight – from 55-64. Most of them were construction site workers and local office employees. The survey was administered in 2010.

■ Measures

Scale (Appendix A) items (manifest variables) A1 (I like my supervisor very much as a person), A2 (My supervisor is the kind of person one would like to have as a friend), and A3 (My supervisor is a lot of fun to work with) measure the latent variable *affect* currency of LMX; items L1 (My supervisor would defend me to others in the organization if I made an honest mistake), L2 (My supervisor defends my work actions to a superior, even without complete knowledge of the issue in question), and L3 (My supervisor would come to my defense if I were "attacked" by others) the *loyalty* currency; items C1 (I do work for my supervisor that goes beyond what is specified in my job descriptions), C2 (I am willing to apply extra effort, beyond those normally required, to meet my supervisor's work goals), and C3 (I do not mind working my hardest for my supervisor) the *contribution* currency; and P1 (I respect my supervisor's knowledge of and competence on the job), P2 (I am impressed with my supervisor's knowledge of his/her job), and P3 (I admire my supervisor's professional skills) the *professional respect* currency (Liden & Maslyn, 1998).

The scale items T1 (My supervisor is always "good" and "right" by moral standards), T2 (My supervisor inspires me to always be "good" and "right" by moral standards), T3 (My leader is honest, credible, and consistent in putting values into action), and T4 (My leader activates positive psychological states to achieve self-awareness and positive self-regulation) measure leadership *traits* (Lord, De Vader, & Alliger, 1986; Belasen & Frank, 2008); R1 (My supervisor encourages me toward high performance standards), R2 (My supervisor puts forth sufficient effort to help me improve significantly my performance), and R3 (My supervisor always provides guidance for major reviews of my work performance) measure leadership *roles* (Mintzberg, 1973); and S1 (My supervisor allows the group to take responsibility for task decisions), S2 (My supervisor emphasizes shared ideas and participative decisions), and S3 (My supervisor facilitates group discussions to make a decision) measure leadership *styles* (McGregor, 1960; Yu & Miller, 2005). Satisfaction with supervision, decision to stay, and working inspired (manifest variables) measure subordinate behavior (latent variable). Individual performance did not load on the subordinate behavior latent variable. In Taiwan, group performance is encouraged and appraised.

■ Dependent and independent variables

The LMX currencies – *affect, loyalty, contribution,* and *professional respect* -- were used as dependent and the leadership characteristics – leadership *traits, roles*, and *styles* -- as independent variables and vice-versa to reveal the reciprocal relationships of these constructs.

Leadership characteristics and LMX currencies were independent variables for perceived supervision. The perceived supervision was an independent variable for subordinate behavioral outcomes: satisfaction with supervision, decision to stay, and working inspired.

■ Scale Reliability, Construct Validity, and Common Method Variance

The reliability of the whole scale -- Cronbach's Alpha (Nunnally, 1978) -- is .982. The reliability of the LMX scale (the first 12 items in Appendix A) is .963, and the reliability of the supplemental questionnaire relevant to leadership traits, roles, and styles is .971. Table 1 has subscale reliabilities for LMX currencies (affect, loyalty, contribution, and professional respect) and leadership characteristics (traits, roles, and styles). All the subscale reliabilities are greater than .70.

Correlations between a measure of a construct and a number of other measures that should theoretically be associated with it -- convergent validity (Campbell & Fiske, 1959) -- or vary independently of it -- discriminant validity (Westen & Rosenthal, 2003) -- determine construct validity. The construct validity of LMX currencies was tested by previous research (Scandura & Graen, 1984; Liden & Maslyn, 1998). In confirmatory factor analysis (CFA), the strength of correlation among the leadership characteristics is significantly higher than the strength of correlation with the LMX currencies, indicating convergent validity. Convergent validity is evident when all items (Appendix A) load significantly on their hypothesized constructs (Bagozzi, Yi, & Philips, 1991). In AMOS, model fit was assessed through comparative fit index (CFI), root-mean-square error of approximation (RMSEA), and standardized root-mean-square (SRMR). CFI values of .90 or greater and RMSEA and SRMR values of less than .08 indicate good fit (Byrne, 2001). Items were loaded on the designated seven latent factors. This seven-factor model demonstrated good fit (CFI = .99, RMSEA = .047, SRMR = .025, $X^2[172] = 273.34$) and all item loadings were statistically significant ($p < .01$) and in the expected direction, indicating convergent validity. There are no significant intercorrelations among male and female subsamples in both LMX and leadership measures (discriminant validity). The independence of the constructs in different subsamples confirms discriminant validity. Convergent and disciriminant validity confirms construct validity of both the leadership characteristics and LMX (Table 1).

Table 1: Correlation among Leadership Characteristics and LMX Currencies in the Confirmatory Factor Analysis

Latent factors	Affect	Loyalty	Contribution	Professional Respect	Traits	Roles	Styles
Affect	**.93**						
Loyalty	.71	**.90**					
Contribution	.58	.53	**.85**				
Professional Respect	.63	.64	.76	**.92**			
Traits	.85	.81	.55	74	**.92**		
Roles	.61	.66	.56	.72	.75	**.91**	
Styles	.75	.72	.58	.70	.83	.82	**.89**

Values below the diagonal are correlations, and values on the diagonal in bold are subscale reliabilities, n = 272.

Overall scale reliability is .982; LMX scale reliability is .963; and Leadership Characteristics scale reliability is .971.

High correlations are desirable because these factors must determine one another as hypothesized and seen in other tables.

To check for common method variance (Conway & Lance, 2010), in CFA, we tested a second model in which LMX scale was one latent factor and leadership characteristics scale was a second latent factor. The fit of this model was both poor (CFI = .78, RMSEA = 152, SRMR = .072, X^2[203] = 1467.16) and significantly worse than the fit of the seven-factor model (ΔX^2[31] = 1193.82, p < . 01). This indicates that there is no common method variance that prevents us from a proper solution.

ANALYSES AND RESULTS

Data analysis took place in the following steps. First, the leadership characteristics traits, roles, and styles were analyzed to determine their effect on the LMX currencies *affect, loyalty, contribution,* and *professional respect* (*Hypothesis 1*). Second, the reciprocal effect of LMX currencies on leadership characteristics was tested *(Hypothesis 2)*. Third, the impact of leadership characteristics and LMX currencies on the dependent variable, "Perceived good supervision," was analyzed (*Hypothesis 3)*. Fourth, the effect of the "Perceived good supervision" on subordinate behavior was tested.

■Leadership Characteristics and Leader-Member Exchange (LMX)

In two-factor CFA, leadership characteristics and LMX correlate at .892, indicating that these latent factors predict one another. Regression analyses using the grand means of the variables loaded on seven latent factors in exploratory factor analysis indicate that leadership traits, roles, and styles have statistically significant impact on LMX currencies on most occasions (Table 2). Even though leadership roles have insignificant effect on *affect* and *loyalty, they* have significant impact on *contribution* and *professional respect*. Leadership traits and styles are significant factors in determining all the LMX currencies. The explanatory power (R^2) of leadership characteristics in *contribution* is the lowest (40.2%) and in *affect* is the highest (62.3%).

Hypothesis 1 states that leadership characteristics – traits (McGregor, 1960; Lord, De Vader, & Alliger, 1986; Belasen & Frank, 2008), roles (McGregor, 1960; Mintzberg, 1973), and styles (McGregor, 1960; Yu & Miller, 2005) -- will be the determinants of the LMX currencies --affect, loyalty, contribution (Dienesch & Liden, 1986),

Table 2: Regression Coefficients: The Effect of Leadership Characteristics on LMX Currencies

Dependent Variables	Affect	Loyalty	Contribution	Professional Respect
Independent Variables				
Constant	.713**	.723**	2.295**	1.443**
Traits	.588**	.464**	.158*	.258**
Roles	.017	.090	.214**	.328**
Styles	.295**	.269**	.250**	.205**
R^2	.623	.561	.402	.554

* p < .05
** p < .01

a. The grand means of the subscale items were used.

and *professional respect (*Liden & Maslyn, 1998). Leadership traits, roles, and styles are significantly correlated with a*ffect* and *loyalty* currency of LMX (Table 1) at p < .01. Additionally, in regression (Table 2), traits and styles are strong predictors of *affect* and *loyalty* (Table 2) at p < .01. Leadership roles have no significant impact on *affect* and *loyalty* in regression. All the leadership characteristics have significant correlations with *contribution* and *professional respect* (Table 1). Leadership traits, roles and styles also have a significant effect on *contribution* and *professional respect* in regression (Table 2) at p < .01, confirming that leadership traits, roles, and styles are determinants of some LMX currencies. Traits have strongest and significant impact on *affect* and *loyalty* and weaker but significant effect on *contribution* and *professional respect*. It should be expected that roles would have strongest impact on *professional* r*espect*. Indeed, it is so. Styles have approximately even impact on affect, loyalty, and contribution and weakest impact on

professional respect. The results are logical, confirming the validity of *Hypothesis 1* which is supported.

The Reciprocal Effect of LMX on Leadership Characteristics

Not only leadership has significant impact on the LMX, but also LMX currencies reciprocally affect leadership traits, roles, and styles because they interact reciprocally (Table 3).

Table 3: Regression Coefficients: The Reciprocal Effect of LMX Currencies on Leadership Characteristics

Dependent variables	**Traits**	**Roles**	**Styles**
Independent variables			
Constant	.234	.502	.250
Affect	.407**	.124*	.306**
Loyalty	.277**	.227**	.256**
Contribution	-.062	.048	.057
Professional respect	.300**	.465**	.296**
R^2	.696	.538	.624

* p < .05
** p < .01

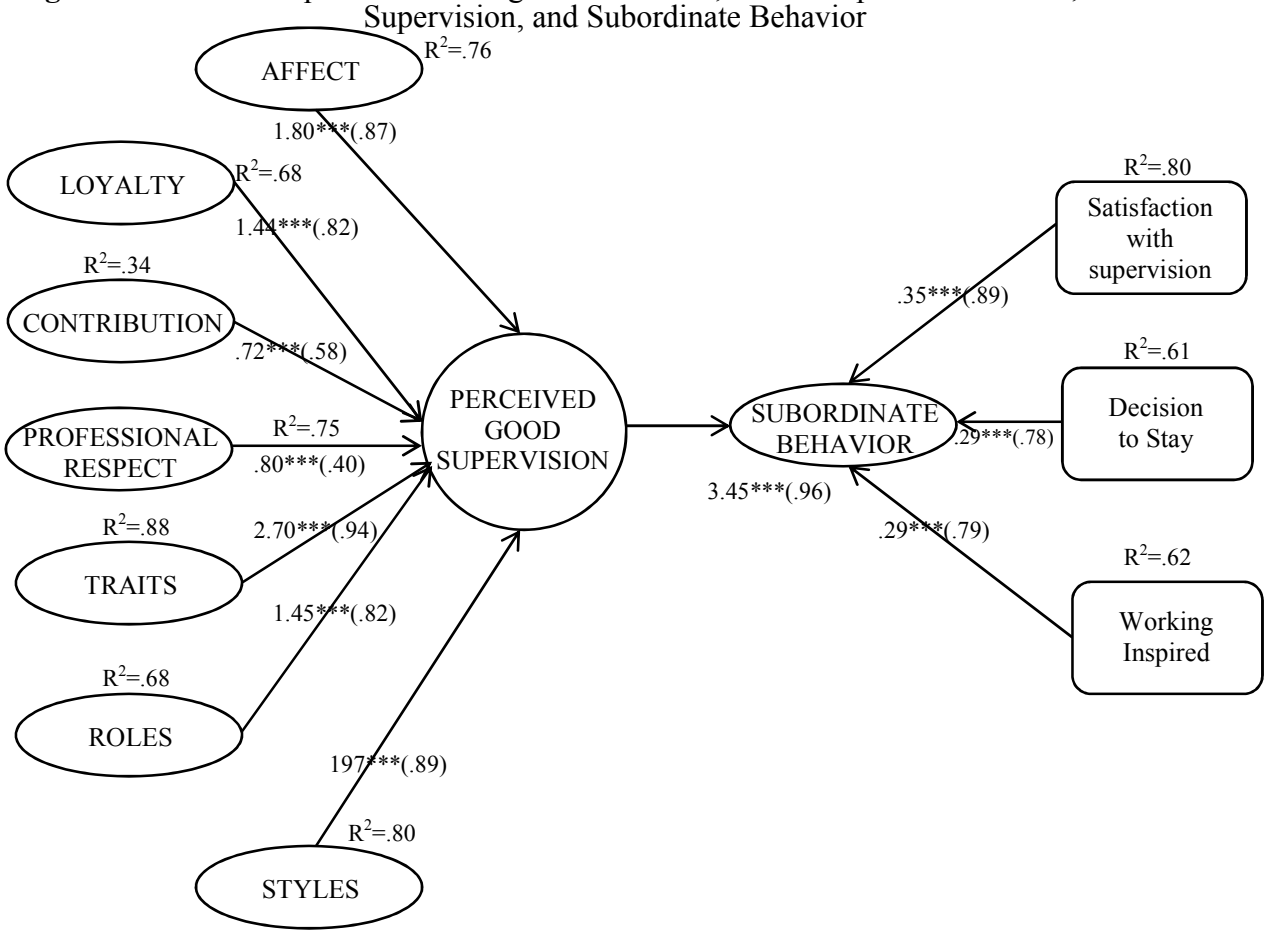
The *affect, loyalty,* and *professional respect* currencies have significant effect on the leadership traits at $p < .01$ and $R^2 = .696$; leadership styles at $p < .01$ and $R^2 = 624$. *Loyalty* and *professional respect* have strong impact on roles at $p < .01$ and *affect* has at $p < .05$ and $R^2 = .538$. Among the LMX currencies, only *contribution* has an insignificant impact on all the leadership characteristics (traits, roles, and styles).

Hypothesis 2 stating that the LMX currencies -- *affect, loyalty, contribution* (Dienesch & Liden, 1986*),* and *professional respect* (Liden & Maslyn, 1998) -- will be reciprocally positively related to leadership characteristics – traits (Lord, De Vader, & Alliger, 1986; Belasen & Frank, 2008), roles (McGregor, 1960; Mintzberg, 1973), and styles (McGregor, 1960; Yu & Miller, 2005) -- is *mainly supported*. The results indicate that *affect, loyalty, and professional respect* have a significant reciprocal effect on leadership traits, roles, and styles. *Contribution* has no impact on all of the leadership characteristics (traits, roles, and styles) as it should be anticipated. *Contribution* is the result of *affect* and *loyalty* in the dyadic relationship and does not involve much emotional exchange. Therefore, it does not have a significant effect on any leadership characteristics (Table 3). Other LMX currencies -- *affect, loyalty*, and *professional respect* -- that involve emotional exchanges have strong reciprocal impact on the leadership traits, roles, and styles. However, LMX currencies have weaker reciprocal impact on leadership characteristics, indicating that leadership characteristics are the determinants of LMX currencies.

Perceived Supervision and Behavioral Outcomes

The structural equations model (SEM) depicted below (Figure1; Table 4) fits the data well (CFI = .977, RMSEA = .049, SRMR = .032, $X^2[235] = 384.81$). All the LMX currencies (*affect, loyalty, contribution,* and *professional respect*) and all the leadership characteristics (traits, roles, and styles) have a significant effect on the perceived supervision. The effect of the leadership characteristics on perceived good supervision is stronger than the impact of the LMX currencies

Figure 1: Structural Equation Modeling Results: LMX, Leadership Characteristics, Perceived Supervision, and Subordinate Behavior



a.Unstandardized path coefficients (b) are reported, with standardized coefficients (β) in parentheses. Ovals and the circle represent latent variables; boxes represent manifest variables. The manifest variables that determine latent variables in ovals on the left are not depicted for ease of presentation. See Table 4 below. n = 272
*** p < .001
** p < .01
* p < .05

according to the path coefficients because leadership characteristics have direct impact on perceived supervision, and LMX currencies are influenced by both leader and member characteristics. Perceived supervision has significant effect on employee behavioral outcomes (satisfaction with supervision, decision to stay, and working inspired).

Hypothesis 3 suggests that leadership characteristics -- traits, roles, and styles – (McGregor, 1960), LMX currencies -- *affect, loyalty, contribution* (Dienesch & Liden, 1986), and *professional respect* (Liden & Maslyn, 1998) -- will be positively related to perceived supervision. All the latent LMX variables *affect, loyalty, contribution*, and *professional respect* and leadership characteristics (traits, roles, and styles) have significant and strong effect ($p < .001$) on perceived good supervision in the structural equation model, supporting *Hypothesis 3.*

Hypothesis 4 suggests that perceived good leadership has significant impact on member behavior. The results of structural equation modeling indicate that the latent variable *perceived good supervision* has significant effect

Table 4: Path Coefficients and Their Significance Levels and Squared Multiple Correlations in CFA

Manifest variables	Latent variables	Unstandardized path coefficients and their significance	Standardized path coefficients	R-Square
A1		.990***	.786	.800
A2	AFFECT	1.225***	.884	.781
A3		1.195***	.896	.803
L1		1.454***	1.104	.866
L2	LOYALTY	.987***	.755	.722
L3		1.096***	.829	.688
C1		.623***	.506	.555
C2	CONTRIBUTION	1.029***	.878	.771
C3		1.045***	.869	.756
P1		1.057***	.870	.757
P2	PROFESSIONAL RESPECT	1.127***	.929	.863
P3		.910***	.712	.763
T1		1.098***	.853	.727
T2	TRAITS	1.047***	.813	.825
T3		1.159***	.858	.736
T4		1.079***	.830	.684
R1		1.159***	.857	.734
R2	ROLES	1.237***	.951	.905
R3		.915***	.738	.728
S1		.983***	.746	.716
S2	STYLES	1.207***	.936	.876
S3		1.060***	.824	.679

*** $p < .001$

($p < .01$) on the latent variable *subordinate behavior* measured by positive member feelings and actions such as satisfaction with supervision, decision to stay, and working inspired. *Hypothesis 4* is also supported.

DISCUSSION

In this study, we drew on the LMX, trait, role, and style theories of leadership to develop the "LMX, leadership characteristics, perceived supervision, and subordinate behavior linkage model" and tested the following set of relationships: (1) LMX is formed under strong influence of leader characteristics (traits, roles, and styles) and some leadership characteristics have stronger power than others to pay attention; (2) LMX is also reciprocally impacts leadership characteristics but this impact is weaker than the impact of leadership characteristics on LMX currencies; (3) both leadership characteristics and LMX have a significant impact on perceived supervision; and (4) perceived supervision has a strong influence on subordinate behavior. This was the focus of the present study and empirical analyses confirmed our hypotheses. The results of our analyses indicate that traits and styles are strong modifiers of LMX currencies -- *affect, loyalty, contribution,* and *professional respect.* In testing the reciprocal impact of LMX currencies on leadership characteristics, three LMX currencies – *affect, loyalty,* and *professional respect* -- have a significant effect on all the leadership characteristics. Both LMX and leadership characteristics have a significant effect on perceived good supervision as indicated by SEM (Figure 1). Also, perceived good supervision has a strong influence on subordinate behavior as show the results of SEM (Figure 1).

The entire scale, both the LMX-MD (Liden & Maslyn, 1998) and leadership characteristics scales, and their subscales (Table 1) are highly reliable (Nanully, 1978). It is confirmed that the LMX and added scale for leadership characteristics as well as the overall extended scale have construct (convergent and discriminant) validity according to the validation methodologies available in the literature (Bagozzi, Yi, & Philips, 1991; Westen & Rosenthal, 2003).

■ Applications of the Study

The present research contributes to theory on perceived supervision and subordinate behavior through the prism of LMX (Dienesch & Liden, 1986) and leadership characteristics, defining the latter as leadership traits, roles, and styles. It also analyzes the reciprocal effect of leadership characteristics and LMX currencies on one another. Leadership characteristics and LMX together determine if supervision is perceived by organizational members positively. The results indicate that high quality LMX and positive leadership produce the perceptions of good supervision that generate positive subordinate behavior. This seems to be obvious, but it has not been empirically tested in literature in the context of LMX currencies and leadership characteristics.

Leadership roles have a significant effect on *contribution* and *professional respect*, but not on *affect* and *loyalty* (Table 2). Affection and loyalty are mainly based on personal relationships (Dienesch & Liden, 1986) between a leader and a follower. Supervisory roles are formal and official and emerge from position-power which is the context for affection and loyalty rather than content. Therefore, roles do not modify *affect* and *loyalty* while traits and styles do so, as they are mainly informal.

Only the c*ontribution* currency does not have any impact on all the leadership characteristics (Table 3). The reasons may be various. Individual contribution is not encouraged and assessed; only collective effort, team work, and high team performance are expected. Therefore, respondents might rate the question about "my performance" low because they often do not directly link their individual performance to supervision and leaders' actions towards teams. In other countries, the results may be different.

The empirical results help us revisit leadership traits, roles, and styles to build effective leader-member relations so that supervision is perceived by subordinates positively because good supervision facilitates positive subordinate behavior. Specifically, the *affect* (the path coefficient is 1.8, significance level $p < .001$, and $R^2 = .76$) and *loyalty* (1.44, $p <. 001$, and $R^2 = .82$ accordingly) currencies of LMX and leadership traits (2.71, $p < .001$, and $R^2 = .88$), styles (1.99, $p < .001$, and $R^2 = 80$), and roles (1.61, $p < .001$, $R^2 = .72$) are important factors for building an effective leadership and forming positive subordinate perceptions, feelings, attitudes, and behavior attributed to satisfaction with supervision (Mardanov, Maerts, & Sterrett, 2008), decision to stay (Maertz & Griffeth, 2004), and working inspired (MvGregor, 1960).

Although the c*ontribution* and *professional respect* currencies of LMX have smaller, but significant ($p < .001$) path coefficients and R-squares in explaining the perceptions of supervision, these variables are also important for managers in building their traits, enhancing roles, and improving styles so that subordinates perceive supervision as good and behave as managers want. Managers should emphasize all the LMX currencies and leadership characteristics that have heavier regression weights, because subordinate perceptions impact his or her behavior very strongly (in our case, the path coefficient is 3.45 at $p < .001$). Decision to stay (path coefficient .29, $p < .001$, and $R^2 = 61$), satisfaction with supervision (.35, $p < .001$, and $R^2 = 8$), and working inspired (.30, $p < .001$, and $R^2 = .62$) are the patterns of subordinate feelings and behavior triggered by the perceived good supervision. Individual performance did not load well on the subordinate behavior latent variable, indicating that collective performance should be emphasized in the research of LMX in the collectivist culture.

■ Limitations and Future Research

The results are relevant to the leadership, LMX, perceived supervision, and subordinate behavior in one country and one industry – construction in Taiwan. Another limitation is the focus on member perceptions of leadership only; leader perceptions of leadership and member characteristics are not considered.

Future research should use a holistic approach to examine both leader (McGregor, 1960; Mintzberg, 1973) and member characteristics (McClain, 1991) as determinants of LMX; we have to learn about leader perspectives of both member and leader characteristics and LMX as well as member view-points of leader and member characteristics and LMX. Research can replicate the methodology of this study to investigate the relationships among leadership characteristics and LMX currencies as well as their effect on perceived supervision and subordinate behavior in different countries, industries, and organizations. The *contribution* currency of LMX is not a significant factor for leadership characteristics in Taiwan. Also, leadership roles do not modify the *affect* and *loyalty* currencies of LMX. These variables may be important factors in other countries and industries. Individual performance was not a determinant of employee behavior attributed to perceived supervision in Taiwan. In other countries and industries, this factor may be a significant determinant of subordinate behavior. Additionally, "the leadership characteristics LMX, perceived supervision, and subordinate behavior linkage" can be extended to the concept of employee job satisfaction.

CONCLUSION

The present research has attempted to contribute to the literature on the effect of leadership characteristics -- traits (McGregor, 1960; Lord, De Vader, & Alliger, 1986; Belasen & Frank, 2008), roles (McGregor, 1960; Mintzberg, 1973) and styles (McGregor, 1960; Yu & Miller, 2005; Kao & Kao, 2007) – as determinants of LMX currencies -- *affect, loyalty, contribution* (Dienesch & Liden, 1986; Scandura, Graen, & Novak, 1986; Dunegan, Uhl-Bien, & Duchon, 2002; Erdogan & Enders, 2007) and *professional respect* (Liden & Maslyn, 1998), reciprocal effects of LMX currencies on leadership characteristics, and the concentrated impact of leadership characteristics and LMX on perceived supervision that influence follower behavior.

We examined the underexplored area of leadership characteristics and LMX currencies as determinants of one another and perceived supervision. We linked the perceived supervision to member behavior in the Taiwanese construction industry. We also addressed the undertheorization of the leadership traits, roles, and styles as determinants of LMX, emphasizing the core leadership characteristics. We also theorized and empirically tested the reciprocal and stronger impact of leader-member exchange currencies on leadership traits, roles, and styles as compared to the impact of leadership characteristics on leader-member exchange currencies.

Although scholars have argued that dyadic relationships in LMX are attributed to leader and member behavior (Dansereau, Graen, & Haga, 1975; Liden & Maslyn, 1998; Mardanov, Maertz, & Sterrett, 2008; Mardanov, Heischmidt, & Henson, 2008), theory explaining how leadership traits, roles, and styles affect LMX currencies is lacking. Also, the theoretical explanation of the perceived supervision through the prism of the mentioned leadership characteristics and LMX currencies, and the effect of perceived supervision on follower behavior were not presented in the literature. Our results point to the important role of perceived supervision in subordinate feelings and behavior measured by satisfaction with supervision, decision to stay, and inspiration. We hope that this research will encourage future scholars of LMX, as well as businesses, to examine the role of leadership characteristics, LMX, perceived supervision, and subordinate behavior linkage in contributing to the emergence of new organizational arrangements.

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Appendix A: Confirmatory Factor Analysis: Measurement of Leadership Characteristics and LMX currencies (Factor Loadings)

Affect	A1. I like my supervisor very much as a person (.893) A2. My supervisor is the kind of person one would like to have as a friend (.870) A3. My supervisor is a lot of fun to work with (.903)
Loyalty	L1. My supervisor would defend me to others in the organization if I made an honest mistake (.931) L2. My supervisor defends my work actions to a superior, even without complete knowledge of the issue in question (.847) L3. My supervisor would come to my defense if I were "attacked" by others (.835)
Contribution	C1. I do work for my supervisor that goes beyond what is specified in my job descriptions (.724) C2. I am willing to apply extra efforts, beyond those normally required, to meet my supervisor's work goals (. 863) C3. I do not mind working my hardest for my supervisor (.862)
Professional respect	P1. I respect my supervisor's knowledge of and competence on the job (.866) P2. I am impressed with my supervisor's knowledge of his/her job (.919) P3. I admire my supervisor's professional skills (.873)
Traits	T1. My supervisor is always "good" and "right" by moral standards (.850) T2. My supervisor inspires me to always be "good" and "right" by moral standards (.887) T3. My leader is honest, credible, and consistent in putting values into action (.876) T4. My leader activates positive psychological states to achieve self-awareness and positive self-regulation (.848)
Roles	R1. My supervisor encourages me toward high performance standards (.861) R2. My supervisors puts forth sufficient effort to help me improve significantly my performance (.937) R3. My supervisor always provides guidance for major reviews of my work performance (.855)
Styles	S1. My supervisor allows the group to take responsibility for task decisions (.846) S2. My supervisor emphasizes shared ideas and participative decisions (.914) S3. My supervisor facilitates group discussions to make a decision (.838)

a. The first twelve questions are LMX items from LMX-MD (Liden & Maslyn, 1998) and the rest of the items are designed by the authors based on the prominent leadership theories, and have passed the tests for validity and reliability.

Key Managerial And Organizational Issues of Corporate Entrepreneurship

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ABSTRACT

Entrepreneurship can be regarded as the key to business success nowadays. Yet, for a well-established organization, entrepreneurship still has a role to play and it is not the sole domain of new ventures. This paper explains the basics of the concept of corporate entrepreneurship and identifies its key dimensions. Strategic value and importance of corporate entrepreneurship are then highlighted. Antecedents of corporate entrepreneurship are also covered which could shed lights to managers on how to promote corporate entrepreneurial activities and overcome the barriers in organizations. Finally, a conclusion is drawn.

INTRODUCTION

Although the field of entrepreneurship originated in the study of those individuals who created new ventures, it has expanded to include entrepreneurship as a firm-level phenomenon (Covin & Slevin 1991; Guth & Ginsberg, 1990; Hornsby, Naffziger, Kuratko, & Montagno 1993; Pinchot 1985; Sathe 1989; Stevenson & Jarillo 1990). This phenomenon has been phrased as corporate entrepreneurship, intrapreneurship, organizational entrepreneurship (Kuratko & Morris 2003), or corporate venturing (Venkataraman, MacMillan & McGrath, 1992).

Past empirical research indicated that the pursuit of corporate entrepreneurial activities can lead to improved organizational performance (e.g. Antoncic & Hisrich 2001; Kemelgor 2002; Kuratko, Ireland & Hornsby 2001; Luo, Zhou & Liu 2003; Morris & Trotter 1990; Zahra & Covin 1995). Hence, given its importance to organizational survival and value generation, corporate entrepreneurship has gradually received considerable attention by both scholars and practitioners. It is expected that by understanding the factors fostering and inhibiting corporate entrepreneurship, insights can be gained to help promote corporate entrepreneurial initiatives in organizations. The next section is going to discuss the definitions and basics of corporate entrepreneurship. The reasons for corporate entrepreneurship becoming an important and emerging area of research in entrepreneurship are also investigated. The focus will then turn to the antecedents of corporate entrepreneurship with some managerial implications drawn. With reference to literature as well as training and consulting experience of some academics, a framework for promoting corporate entrepreneurship will then be delineated. The last section will present the conclusion for the paper.

BASICS OF CORPORATE ENTREPRENEURSHIP

Similar to some management concepts, there is no universal definition of corporate entrepreneurship (Gautam & Verma 1997; Sharma & Chrisman 1999; Venkatachalam & Weaver 1989). This lack of coherence in definition is due to the immaturity of the field (Sharma & Chrisman 1999). Sharma and Chrisman (1999) conducted a comprehensive review on the definitions of corporate entrepreneurship and related terms. They identified 10 definitions of corporate entrepreneurship and another 17 similar definitions under labels like corporate venturing, internal corporate entrepreneurship, intrapreneuring, internal entrepreneurship, and strategic renewal; each representing entrepreneurial efforts within an existing organization. Since the field of corporate entrepreneurship is still in the developmental stage, they suggested adopting broad definitions for the concept. Yet, they recognized two common themes that cut across all the reviewed definitions: (1) a focus on innovation and (2) a reference to the relatedness of the innovative activity to the core activities of the organization.

Based on the review, the authors developed a classification framework for corporate entrepreneurship with four dimensions (1999, pp. 22 - 23) as below:

- **Structural autonomy**
  The extent to which internal corporate venturing activities of an organization are embedded within its existing organizational units; ranges from totally embedded within the organization to being a separate new-venture division isolated from the organization;
- **Degree of relatedness to existing business**
  Degree of relatedness (newness to the organization) in terms of product offerings, markets, or core competencies and closely related or completely unrelated resources required;
- **Extent of innovation**
  Degree of newness of a venture in the marketplace; may vary from imitative entries to innovative entries that are potentially "frame-breaking"; and
- **Nature of sponsorship**
  Degree of formal authorization for the venture; may vary from being formal or induced to being informal or autonomous.

To make the definition broad enough, Sharma and Chrisman (1999, p. 18) defined corporate entrepreneurship as "the process whereby an individual or a group of individuals, in association with an existing organization, create a new organization or instigate renewal or innovation within that organization. Thus, strategic renewal, innovation, and corporate venturing are all vital and legitimate parts of the corporate entrepreneurship process.

On another front, Zahra (1991) concluded that corporate entrepreneurial activities can either be internally or externally oriented. Internal activities are characterized by the development of internal markets and relatively small and independent units within a large organization to create internal test-markets or expand improved or innovative staff services, technologies, or production methods within the organization. These activities might cover product, process, and/or administrative innovations at various levels of the organization. Externally oriented activities, on the other hand, entail mergers, acquisitions, or joint ventures. Zahra (1991) also observed that no matter corporate entrepreneurial activities are internal or external in focus, they can be formal or informal. Informal activities occur autonomously, with or without the consent of the official organization. Formal activities may occur by designating a unit to spearhead corporate entrepreneurial activities.

STRATEGIC IMPORTANCE OF CORPORATE ENTREPRENEURSHIP

With the support from the past literature, a number of scholars have provided reasons for the rising importance of corporate entrepreneurship in the research area of entrepreneurship in the past few decades. Some major reasons for such a phenomenon are explained below.

One of the early writers asserting the importance of corporate entrepreneurship is Pinchot (or intrapreneuring in his term). In his books *Intrapreneuring* (1985) and *Intrapreneuring in Action: A Handbook for Business Innovation* (1999, co-authored with Pellman), he regarded corporate entrepreneurship as the primary source of lasting competitive advantage in the twenty-first century. Based on his consulting and training experience, he believes that corporate entrepreneurship can help to make innovation happen inside established organizations. Tan (1997) alleged that together with corporate governance, corporate entrepreneurship is one of the two significant factors sustaining continued success of companies and contributing to global economic well-being in the twenty-first century. Tan (1997) further highlighted that organizations have discovered the need to innovate internally. In order to remain competitive, they need to be innovative in their products or services, processes, and also in management. Large organizations would like to transform themselves so as to incorporate the entrepreneurial spirit in their organizations.

According to Morris and Kuratko (2002), the pursuit of corporate entrepreneurship has emerged from a number of pressing problems such as (1) increased global competition; (2) continual downsizing of organizations for higher efficiency; (3) dramatic changes, innovations, and improvements in the marketplace; (4) perceived weaknesses in traditional corporate management; and (5) the exodus of innovative-minded employees who are disenchanted with bureaucratic organizations. These observations revealed that the increasing importance of corporate entrepreneurship as an area of entrepreneurship research can be attributed to the rising environmental pressures facing established organizations, the need to build up a sustainable competitive advantage to remain competitive in the twenty-first century, and promising payoff with the adoption of corporate entrepreneurial initiatives.

It has also been found from past research that corporate entrepreneurship can help to improve financial and non-financial performance of organizations (e.g., Kemelgor 2002, Zahra 1991; Zahra & Covin 1995). A review of literature showed that Zahra has done substantial research on the impact of corporate entrepreneurship on organizational performance. In Zahra and Covin's (1995) study, they found that corporate entrepreneurship had a positive impact on financial measures of organizational performance. The effect on performance tends to be modest over the first few years and then increases over time. This may suggest that corporate entrepreneurship may be a generally effective means for improving long-term organizational performance. Also, it was also found that corporate entrepreneurship was a particularly effective practice among organizations operating in a hostile environment, as opposed to a benign environment.

The results of Antoncic and Hisrich's study (2001) showed that corporate entrepreneurship was both positively and highly correlated with growth and profitability. Another study done by Kemelgor (2002) also found that Dutch and US management groups' orientation toward corporate entrepreneurship was positively correlated with the number of innovations, patents, and return on sales. The researchers argued that the use of correlation technique was well-established in the corporate entrepreneurship literature (Barret & Weinstein, 1998). The study result indicated that both groups of management realized the beneficial outcomes for their organizations to be "corporate entrepreneurship-oriented". This study also reveals that orientation toward corporate entrepreneurship would lead to not only positive financial performance but also non-financial performance. The four studies showed that corporate entrepreneurial activities can help improve both the financial and non-financial performance of entrepreneurial organizations. All the above discussion provides support for the strategic value and great importance of corporate entrepreneurship.

ANTECEDENTS OF CORPORATE ENTREPRENEURSHIP

Recognizing the strategic value and importance of corporate entrepreneurship, there has been a growing research interest in exploring the antecedents of corporate entrepreneurship. Yet, relatively limited research is found to show how antecedents of corporate entrepreneurship influence the entrepreneurial intensity in organizations. Zahra (1991) attempted to identify the effects of environmental, strategic, and organizational factors on the intensity of corporate entrepreneurship. There are several domains worth noting. Firstly, it is found that environmental dynamism, hostility, and heterogeneity intensified corporate entrepreneurship. Regarding the adoption of strategies, growth-oriented strategies were associated with increased corporate entrepreneurship, whereas a strategy of stability was not conducive to corporate entrepreneurship. Besides, the scanning, formal communication, and integration components of formal organizational structure are positively related to corporate entrepreneurship while increased differentiation and extensive controls negatively affect corporate entrepreneurship. Lastly, it is found that clearly defined organizational values are positively correlated with corporate entrepreneurship.

In addition, Barringer and Bluedorn (1999) examined the effects of five strategic management practices on the intensity of corporate entrepreneurship. The five strategic management practices included scanning intensity, planning flexibility, planning horizon, locus of planning and control attributes (both strategic and financial). The authors developed six hypotheses and four of them were supported. Specifically, the results indicated a positive relationship between intensity of corporate entrepreneurship and certain strategic management practices, namely, scanning intensity, planning flexibility, locus of planning and strategic controls. The hypothesis of a negative relationship between planning horizon length (short-term vs. long-term) and intensity of corporate entrepreneurship was not supported. Another hypothesis of a negative relationship between the degree of emphasis on financial controls and intensity of corporate entrepreneurship was also not supported. The study generally indicated that an organization's strategic management practices can influence its intensity of corporate entrepreneurship.

Similar to the findings identified by Barringer and Bluedorn (1999), Kemelgor (2002) also discovered in his study that three strategic management practices were positively related to orientation toward corporate entrepreneurship in the US sample. Unlike Barringer and Bluedorn's study (1999), Kemelgor's study just focused on three strategic management practices instead of five. They all, including opportunity recognition, planning flexibility and locus of planning, were found to be positively related to orientation of corporate entrepreneurship. Another study by Antoncic and Hisrich (2001) identified the impacts of certain internal organizational factors and external environmental factors on corporate entrepreneurship. They were both found to have impacts on corporate entrepreneurship. Internal organizational factors, namely, communication, formal controls, environmental scanning, organizational support, competition-related values, and person-related values, were found to be positively related to corporate entrepreneurship to a great extent. External environmental characteristics, including dynamism, technological opportunities, industry growth, demand for new products, and favourability of change, were also found to be highly and positively related to corporate entrepreneurship.

Apart from the above endeavors in examining the antecedents of corporate entrepreneurship, Hornsby, Kuratko, and Zahra (2002) found that past research recognized the important role of middle managers in creating an environment that encourages innovation and entrepreneurship. It is also generally accepted that internal organizational factors were regarded as vital in encouraging corporate entrepreneurial activities. However, little was actually known about the specific internal organizational factors that influenced middle managers to initiate corporate entrepreneurial activities. They then developed the Corporate Entrepreneurship Assessment Instrument to assess the key internal organizational factors affecting middle managers to initiate corporate entrepreneurial actions. Five factors were found based on their exploratory and confirmatory factor analyses. They, in order of importance, include: (1) management support for corporate entrepreneurship, (2) work discretion, (3) rewards/reinforcement, (4) time availability, and (5) organizational boundaries.

The above findings confirm that certain external environmental and internal organizational factors are conducive or inhibitive to corporate entrepreneurship. Yet, individual characteristics as antecedents of corporate entrepreneurship have not been extensively tested and reported in the literature and this remains an area for further research.

MANAGERIAL IMPLICATIONS

The empirical findings mentioned above provide hints for top managers who want to promote corporate entrepreneurship in their organizations so as to achieve better financial and non-financial performance. Research findings tend to suggest that corporate entrepreneurship is an effective means in improving long-term organizational performance. Yet, barriers to corporate entrepreneurship go parallel with it. The following discussion addresses the ways to promote corporate entrepreneurship and the barriers that should be aware of.

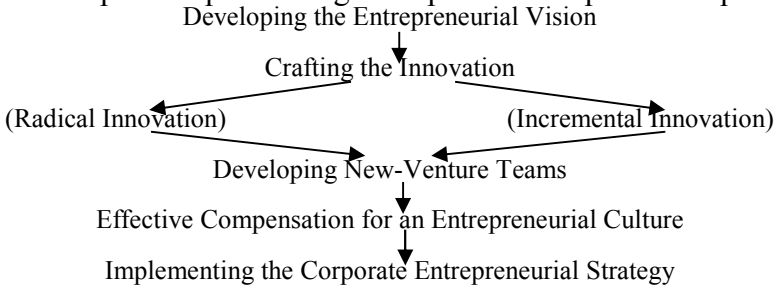
■ Promoting Corporate Entrepreneurship

As external environmental factors are normally beyond the control of an organization, managers are unable to influence them so as to promote corporate entrepreneurship. However, they should pay more attention to the changes in the external environment as some environmental conditions such as environmental dynamism, hostility, and heterogeneity require a higher degree of orientation toward corporate entrepreneurship. Such an orientation should be increased to deal with the increased or higher environmental dynamism, hostility, and heterogeneity. Internal organizational factors are more likely to be "changeable" to facilitate corporate entrepreneurial initiatives. From the above-discussed research findings, it can be seen that management support, communication, planning flexibility and so on can be enhanced to promote corporate entrepreneurship.

Seeing the need to promote corporate entrepreneurship in organizations, Kuratko, Ireland, and Hornsby (2001) developed a step-by-step framework by summarizing their consulting and training experience in corporate entrepreneurial initiatives (see Figure 1). The suggestions are drawn from the literature and the training and consulting experience for The Associated Group, a US insurance company.

Acordia, Inc. had been created as a new venture based on the organization's corporate entrepreneurial initiatives. The new venture has been operated very successfully by adopting corporate entrepreneurial strategies. To succeed in initiating corporate entrepreneurial actions in an established organization, top-level managers must first develop an entrepreneurial vision for the organization that indicates what the organization expects to achieve. This vision can allow affected parties to focus on crucial tasks as they pursue organizational and personal objectives. The next step is to encourage innovation among employees as the key element of the corporate entrepreneurial strategy. Innovation can either be incremental or radical. Incremental innovation refers to the "systematic evolution of a product or service into newer or larger markets" whereas radical innovation represents "unprecedented breakthroughs" (Kuratko & Welsch 2004, p. 356).

Figure 1: Steps in Implementing a Corporate Entrepreneurship Strategy



Source: Kuratko, D.F.; Ireland, R.D.; and Hornsby, J.S. (2001). "Improving Firm Performance through Entrepreneurial Actions: Acordia's Corporate Entrepreneurship Strategy." Academy of Management Executive, Vol. 15, No. 4, p. 62.

New venture teams should then be formed. Top managers nowadays do not have access to all the information needed to innovate. Allowing new venture teams to innovate and to pursue entrepreneurial activities will be more appropriate. They should come from different functional areas to share their diverse knowledge and skills. Thus, the chance to develop successful product, process, or market innovation will increase (Kuratko, Ireland & Hornsby 2001). The next step is to design an effective compensation system to reward for an entrepreneurial culture. It should include not only monetary compensation but also intrinsic reward. Research tends to show that "a mixture of variable pay or incentives results in a more significant effect on firm performance than does any single compensation source" (Kuratko, Ireland & Hornsby 2001). The last part will be the implementation of the corporate entrepreneurship strategy.

According to Ginsberg and Hay (1994), corporate entrepreneurship is both a "top down" and a "bottom up" process. Based on their combined experience in both researching and launching corporate entrepreneurship projects, they discovered that while the process of corporate entrepreneurship should be shaped and directed from the top, the venture must be managed from below by the venture manager. The middle and lower level managers are important in the implementation of corporate entrepreneurship strategies.

■ Barriers To Corporate Entrepreneurship

Based on surveys on a number of medium- and large-sized industrial organizations, an extensive review on corporate innovation and entrepreneurship literature, and also in-depth assessments of three Fortune 500 companies, Morris (1998) identified six categories of barriers to corporate entrepreneurship. They include (1) inflexible and misdirected systems, (2) bureaucratic and mechanistic structures, (3) blurred strategic direction, (4) unduly complex policies and procedures, (5) conservative and complacent people, and (6) ill-defined and unfit culture. The author claimed that the six categories of constraints are neither mutually exclusive nor independent. For instance, systems overlap with policies while people problems might be highly related to

cultural problems. The following discussion explains how these factors could constrain corporate entrepreneurial actions.

Established systems in maturing organizations tend to put emphasis on stability and order and thus create disincentive for corporate entrepreneurship. For example, employee reward system often encourages safe and conservative behaviour that produces short-term payoffs. Bureaucratic structures are prevalent in established organizations. This limits the authority to try new approaches in addressing obstacles or expending required resources. Responsiveness to the market will be slow and cooperation among departments is also not encouraged. Thus, it is difficult to initiate corporate entrepreneurial activities in such organizations. Another constraint is often related to the lack of strategic direction. This may be the lack of top management's commitment to the principle of institutionalized entrepreneurship. There may also be a lack of innovation goals (Morris 1998).

Detailed policies and procedures often lead to burdensome red tape which can reduce employees' initiative to take entrepreneurial actions. Also, they can also slow down the process of innovation. Another obstacle comes from people. The research suggested that people are the greatest obstacle of all. Corporate entrepreneurship is about change and the management of change efforts. It is a natural tendency for people to resist change. There is also a preoccupation among employees with the present demands but not the future ones. Corporate entrepreneurship requires a long-term perspective which does not match with their short-term orientation. The last constraint is related to organizational culture. Existing organizational values are frequently inconsistent with current competitive requirements. There may also be a lack of consensus over value priorities such as customer needs, quality, efficiency, service, reliability, etc. making corporate entrepreneurship with no focus (Morris 1998).

Similar to the above findings by Morris (1998), Bridge, O'Neil, and Cromie (1998) identified similar barriers to corporate entrepreneurship. They include resistance to change by people, management barriers, and finally organizational barriers. According to the authors, resistance to change may be due to the fear of waste of investment in terms of energy in an existing job and/or the inability to see the need for change. Management barriers can come from the unwillingness to take risk and being cautious to employees. Managers need to balance the interests of various stakeholders and thus need to be cautious in their actions. Corporate entrepreneurial initiatives tend to be risky with uncertain results. Hence, they are not willing to take entrepreneurial actions. Organizational barriers may include standard operating procedures and rules, job specializations, and organizational culture that constrain cooperation and initiative.

As a summary, both internal human and non-human factors can exert negative influence on corporate entrepreneurial initiatives as discussed above. Human factors can affect non-human factors and vice versa. For example, a top manager who does not want to innovate and take risk could make organizational culture conservative while this would in turn make employees in an organization conservative. Actions need to be taken if managers want to introduce corporate entrepreneurship in their organizations.

CONCLUSION

Research on corporate entrepreneurship has grown due to the rising environmental pressures facing established organizations, the need to build up a sustainable competitive advantage in the twenty-first century, and the confirmed evidence of improved performance with adoption of corporate entrepreneurial actions. There is yet no universally accepted definition of corporate entrepreneurship. However, there seems to be a general agreement that strategic renewal, innovation, and corporate venturing are all important and legitimate parts of the corporate entrepreneurship process.

Research indicates that corporate entrepreneurship can be caused by a number of individual, organizational, and environmental factors. Also, corporate entrepreneurial actions can lead to better financial and non-financial performance, especially in the long-term. Hence, managers should foster corporate entrepreneurship in established organizations by focusing on the factors conducive to corporate entrepreneurship such as more management support and better communication. Consequently, organizational performance, both financial and non-financial aspects, can be improved. Organizations can then survive and thrive in the twenty-first century.

Although there exist factors conducive to corporate entrepreneurship, researchers find that there are internal obstacles to the implementation of corporate entrepreneurial initiatives. They can be classified and summarized as human and non-human factors. Research tends to show that "people" are the greatest obstacle of all. This key barrier needs to be overcome if managers want to have successful implementation of corporate entrepreneurship strategy. Top managers are important in the development and communication of entrepreneurial visions while the final implementation depends very much on every member in the venture teams, no matter lower or middle level managers.

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In Search of The Equilibrium for ERP Project Success: Dynamic Management of Intangible Resources

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ABSTRACT

Enterprise resource planning (ERP) system is well-known as one of the central technological infrastructure that facilitates efficient business operations in a dynamic business landscape. Adoption of the systems however is mired with numerous problems; a well cited reality in multitude industrial and academic reports. This paper applies the dynamic capabilities view to examine the effects of intangible resources (i.e. Governance, Knowledge and Relationship) toward successful implementation of ERP systems in Malaysian service firms. Results from the Partial Least Square (PLS) estimation shows that Relationship resource has a significant individual and direct effect toward ERP implementation success. Further analysis shows that Governance resource is the mediator that enhances the effects of Knowledge and Relationship resources toward successful implementation of ERP systems. The findings suggests that successful ERP implementation could be prominent if the implementing firm is able to manage their technology project by integrating and reconfiguring their intangible resources in a strategic context. The strategic determination of resources with the capability to enhance the competence of other resources can become the strategic equilibrium for ERP project implementation success.

Keywords:Dynamic capabilities, Enterprise Resource Planning, Intangible Resources, Partial Least Squares

INTRODUCTION

Global socio-economic milieu has been changing unprecedentedly in the past few years. Issues such as global warming, terrorism, health pandemics and financial crisis brings forth new challenges in the pursuit for economic prosperity. For an enterprise, the search for business opulence entails employment of varying strategies. In this context, technology driven growth is one of the most popular strategies for most enterprises in recent times. Enterprises use numerous types of technological applications to support their business activities (Thong & Yap, 1995). An enterprise resource planning (ERP) system is recognized as a competent technological application that integrates diverse business processes, thus improving vertical and horizontal information flows in adopting firms (Davenport, 1998; Bingi, Sharma, and Godla, 1999). ERP system uptake across the world has been spectacular. Jacobson, Shepherd, D'Aquila, and Carter (2007) for example cited a significant increase in global ERP vendors' sales revenue of 14% in the year 2005 - indicating the increasing growth in ERP system sales.

However despite a healthy uptake of ERP system, there are also reports of problems and failures with the ERP system implementation. For instance, Krumbholz, Galliers, Coulianos, and Maiden (2000) reported that ERP projects often overrun project budget by 178%, exceed project schedules by two and half times longer and reap just 30% of the anticipated business benefits. Ragoswsky and Somers (2002) cite that long established and high profile enterprises such as Aerogroup, Boeing, Dell, Mobil and Foxmeyer have experienced significant ERP project implementation failures.

The cases of ERP implementation failure have given rise to numerous research exploring the reasons and strategies for successful ERP implementation. The extent of ERP literature reviews have reported various organisational factors contributing to ERP project implementation failures (see, for example, Nah, Lau, and Kuang, 2001; Kanjanasanpetch, and Igel, 2003; Chang, 2004; and Sun, Yazdani, and Overend, 2005; Rai, Brown and Tang, 2009; Elbashir, Collier and Sutton, 2011). Success factors commonly identified include project teamwork and composition, monitoring and evaluation of performance and knowledge management (Francoise, Bourgault, and Pellerin, 2009; Shao, Feng and Liu, 2012). However whilst the pertinent organisational factors are identified, there seems to be little provisions on how these organisational factors should be deployed, exploited and managed in order to heighten ERP project success. This is important as the uptake of 'a technology driven business growth strategy' requires success – a phenomenon that can be captured by understanding whether the technology implementation is completed within the schedule, budget and fulfills users' requirements (Standish, 1999; Wu, 2007; Saeed and Abdinnour-Helm, 2008). A firm planning to adopt an ERP system needs to understand the adverse dimension of the system implementation that is entangled with non-completion within the targeted schedule, budget and non-acceptance by the intended users. Successful ERP implementation and usage may not only reside in possession of adequate and necessary firm resources but also entails the firm's ability to build, integrate and reconfigure their resources as and when needed to address inherent and unexpected problems. In short, the success of

ERP system implementation resides in the firm's ability to manage and balance the equilibrium of success. The equilibrium of success is characterised as the competency of a firm in the administration of the dynamic interrelationships amongst firm resources and deployment of primary resources with the capacity of reinforcing the capabilities of other resources in pursuit of success.

The primary aim of this paper is to model the equilibrium of successful ERP system implementation by examining the dynamic interactions and the primary role played by Governance, Knowledge and Relationship resources in Malaysian service firms. Modeling the dynamic interactions amongst the resources will assist in determining the important resources that could balance the equilibrium of ERP system success. The remainder of the paper is structured as follows:. Section 2 presents a discussion on the theoretical background and the hypotheses developments. Section 3 highlights the research methodology. Section 4 discusses the results of the empirical estimations, and Section 5 provides the conclusion, limitations and future research directions.

THEORETICAL BACKGROUND AND HYPOTHESES

The dynamic capabilities view as envisaged by Teece (1990) is enveloped within the resource based view of firm growth (Penrose, 1959; Barney, 1991). The resource based view suggests that the ownership of valuable, rare, inimitable and non-substitutable internal resources can assist firms in rent creation. Followers of the Schumpeterian economic perspective (see, for example, Nelson, and Winter, 1982 ; Dierickx, and Cool, 1989 ; Amit, and Shoemaker, 1993 ; Mahoney, and Pandian, 1992 ; and Teece, Pisano, and Shuen, 1997) however criticised the resource based view as being static in nature, as attainment of competitive advantage is proposed for one point of time only (Teece, 2009). Such views led to the establishment of the dynamic capability view.

The dynamic capabilities view is defined as 'firm's capacity to deploy resources, usually in combination, using organizational processes to achieve a desired end..... they are information-based, tangible or intangible processes that are firm-specific and are developed over time through complex interactions among the firm's resources' (Amit, & Shoemaker, 1993, p.35). The dynamic capability definition seems to have a clear segregation of the term resources and capability. Ashighlighted by Makadok (2001), a capability or the capacity to carry out organisational processes is inherent within a firm's work culture and practice, and not easily transferable to another party. Cease?? of the firm's operation would dissolve the existing capabilities (Teece, et al., 1997). An ordinary resource on the other hand is easily transferable, especially a tangible resource such as physical infrastructure. Cease?? of the firm's operations often entail a change of ownership of the resources.

The employment of the dynamic capabilities theoretical lens in understanding the underlying reasons for technology adoption success (in a broad sense), and the ERP system implementation success (exclusively), remains scarce. Much of the existing research has used the dynamic capabilities lens to examine the role of tangible and intangible resources towards business performance (see, for example, Bharadwaj, Sambamurthy, and Zmud, 1999; Mata, Fuerst, and Barney, 1995; Ross, Beath, and Goodhue, 1996; Tanriverdi, 2005; Tanriverdi 2006).

Karimi, Somers and Bhattacherjee (2007) were one of the first to use the dynamic capabilities concept to examine the associations between tangible (IT infrastructure) and collective intangible resources (i.e. relationships and knowledge capabilities) toward ERP system implementation success, in a sample of US manufacturing firms. The authors found that knowledge, relationship and IT infrastructure mutually reinforces ERP building, subsequently leading to positive business process outcomes. This paper explores a similar assessment, albeit with significant differences.

First, this study investigates the role of intangible resources exclusively. Three intangible resources are selected for this purpose: Governance, Knowledge and Relationship. Technology implementation in today's environment is not only about having the adequate hardware and software, but is also about adherence and compliance with governance procedures (Bowen, Cheung, and Rohde, 2007; Bernroider, 2008). ERP system is a complex business application that promotes 'best business process practices' and thus facilitation of effective governance processes are essential to safeguard the system's reliability and success (Bernroider, 2008). Effective governance also facilitates efficient alignment of information technology (IT) with business processes (Ramos, 2004) – a key requirement that needs to be met for effective implementation of the ERP system.

A core functionality of an ERP system is to facilitate management of knowledge flows within the firm (Jones, 2005). The implementation process of an ERP system also entails extensive knowledge creation, sharing and dissemination activities, both from external consultant to project members, and the project members to system users (Stenmark, 2000; Vandaie, 2008). Following the suggestions from the literature in ERP knowledge management intersection (see, for example, Sumner, 2000; Soh, Kien and Tay-Yap, 2000; Lech, 2011), it is envisaged that effective management of knowledge is essential for successful ERP implementation. The implementation of the complex and time consuming ERP project requires strong cooperation and relationship building between all those involved in the project. Most critical success factor studies (see, for instance, Bingi, Sharma, and Godla, 1999; King and Burgess, 2006), have identified effective management of the cooperation and bonding amongst

the ERP project members as essential for ERP implementation success.
Second, unlike Karimi et al (2007) manufacturing focus, the current research is focused on the services industry in Malaysia. The selection of this industry is based on two rationales. The first is because the services industry is a major contributor to Malaysia's economic growth. The contribution of the service sector to national growth is increasing each year. In 2010 for instance, the service sector contributed nearly 58% to GDP growth, with strong performance by the finance, wholesale and retail and transport and communication subsectors. By 2015, this sector is expected to increase its GDP contribution share to 61% (EPU, 2011). The second rationale is due to the possible relative importance of intangible resources to the services industry compared to other industries. Unlike the manufacturing industry, services business is contingent heavily on 'soft' business tools and mechanisms such as effective communication, knowledgeable manpower and compliance with rules and regulations. This industry, in most cases, has very little need for tangible resources to execute business with clients. This industry does not produce tangible products offered to clients but rather facilitates a human touch based 'product' to their clients. The intangibility match between the industry and the resources is another underlying reason to focus on the services industry.
The intangible resources discussed above were chosen based on their characteristic of intangible resources or resources without clear physical presence. The management of the intangible resources for ERP projects purpose is conceptualised as being dynamic since the requirements for a particular asset could be paramount at one point of time and decline in another timeline. The changes in the resources requirements and its importance build the dynamism. In another context, the success of ERP system implementation could be determined by a particular intangible resource with ability to balance the equilibrium of success by reinforcing the roles of other intangible resources used in ERP implementation project.

■ Hypotheses

Governing technology functionalities, as well as the processes and activities during technology implementation, is a challenging process. A sound governance strategy will provide better monitoring and control mechanisms to achieve the intended goal as efficiently as possible. In Information Systems literature, the term 'governance' has been used to broadly describe the policies, structures, and processes involved in managing technological functions (Brown and Sambamurthy, 1999; Weill and Broadbent, 2000). Governance is perceived to be critical in the case of ERP implementation as it involves adaptation to the 'best practices' of global business operation standards (Brown and Nasuti, 2005). Adhering to best practices entails compliance to several standards, such as the Sarbanes Oxley Act (SOX), Section 302 (disclosure of internal controls), Section 404 (annual assessment of internal control effectiveness), Section 409 (disclosure to the public on material changes to firm's financial condition) and Section 802 (authentic and immutable record retention).

In recent years, new governance frameworks have emerged to induce greater control and adherence to best practices. In this context, the Control Objectives for Information Technology (COBIT), the Institute of Internal Auditors Research Foundation's Systems Electronic Security Assurance and Control – eSAC, and the IT Infrastructure Library – ITIL stands out (Brown and Nasuti, 2005, Salle and Rosenthal, 2005). The literature recognizes the COBIT standard as one of the best governance standard for technology implementation (Pathak, 2003; Ramos, 2004). The COBIT standard governs most aspects of technology implementation good practices that a business must follow in order to reap expected pay-offs from technological investment (Ramos, 2004).

Based on the discussion, it is clear that successful ERP implementation requires effective coordination and deployment of governance mechanisms that entails adherence to guidelines or standards such as COBIT and Sarbanes Oxley. Thus the following hypothesis is established:

H1: Governance is the primary resource of ERP implementation success equilibrium

There is a growing interest on knowledge as a critical source of competitive advantage in the literature (see, for example, Corso, and Paolucci, 2001; Malhotra, Gosain, and El Sawy, 2005). Firms are giving significant attention on effective management of knowledge in undertaking innovative activities (Hargadon, 1998). The importance of knowledge resource in ERP implementation has been explored in several studies (see, for example, Chan, Walker, and Mills, 2009; Parry, and Graves, 2008; Pan, Newell, Huang, and Galliers, 2006; Vandaie, 2008; Xu, Wang, Luo, and Shi, 2006). One of the primary aims for ERP system usage is to improve knowledge sharing activities within the firm (Vandaie, 2008). For this to happen, ERP system implementation requires sound knowledge management capability (Jones, 2005) that includes engagement of a variety of expertise from both within and outside the firm, cross-functional and cross-divisional knowledge transfer (Baskerville, Pawlowski, and McLean, 2000). Possession of skilled employees is also critical in ERP system implementation success (Vandaie, 2008), as their tacit and explicit knowledge will be valuable in the process of getting the system up and running (Robey, Ross, and Boudreau, 2002).

Within the realm of this study, knowledge resource facilitates successful ERP system implementation in the context of knowledge acquisition, conversion, transfer and dissemination (Li,

Chaudhry, and Zhao, 2006). An ERP project demands the adopting firm to acquire a significant extent of knowledge from external parties such as the consultants and vendors. Proper acquisition of new knowledge is vital to ensure that the knowledge is utilised effectively.

Further, throughout the ERP system implementation process, new tacit knowledge will emerge through discussions, communication, and practice between various interested people. The emerging new knowledge needs to be converted into internal information to be used by all other parties, especially by the ERP project team and end users. In addition, ERP implementation creates knowledge gaps due to different understanding or absorptive capacity between vendors, consultants, internal experts and end users. Firms need to ensure that ERP knowledge obtained is successfully transferred between these parties. Apart from transferring the knowledge, firms also need to have adequate processes to facilitate access to important and relevant knowledge. Effective management of organizational processes relative to these knowledge activities could become a conductive platform for successful ERP implementation. Hence, a second hypothesis is proposed as follows:

H2: Knowledge is the primary resource of ERP implementation success equilibrium

Relationships resource is defined as the ability to coordinate and engage communication and cooperation between IT and business groups (Karimi, et al., 2007). Engagement of different parties, primarily the IT business unit and other management units also entails the sharing of risk and responsibilities relative to an ERP project. Good relationship is also about trust emerging through interactions between different people (Nahapiet and Goshal, 1998). Effective implementation of technology is chiefly associated with the quality of relationship between different user/implementer groups (Ravichandran and Lertwongsatien, 2005).

Appreciation and understanding of different parties' environment can help to deliver expected IT implementation business value (Ravichandran, & Rai, 2000).

Apart from internal relationship (between people within the firm), successful technology implementation is also dependent on external partnership with vendors and consultants. This notion is vital in the context of ERP implementation as the project involves cooperation and participation of internal staff as well as external people. Good relationship management ensures efficient knowledge sharing and trust building between involved parties (Ross, et al., 1996; Wang, and Chen, 2006). Such commodity is not easily exchangeable as it needs to be created upon trust and cooperation between different people within and outside the firm, and often involves a long period of time (Karimi, et al., 2007). Organisational processes enabling relationship building and maintenance could play a pertinent role in ERP implementation success. A third hypothesis is thus proposed that:

H3: Relationship is the primary resource of ERP implementation success equilibrium

■ Researchmodel

The research model based on the above proposed hypotheses is given in Figures 1 - 3. Modeling the primary resource of ERP implementation success equilibrium entails running a series of structural equation modelling (SEM) estimations with the idea of identifying the optimum mediating paths between the different resources, that is, Governance, Knowledge and Relationship. The primary resource will be identified based on the optimum mediating paths depicted by stronger coefficients, t-statistics and R-square values. Each of the independent variable (Governance, Knowledge and Relationship) will function as a mediator if; (a) the variations in levels of the independent variable significantly account for variations in the presumed mediator, (b) variations in the mediator significantly account for variations in the dependent variable and (c) when mediation paths are controlled, a previously significant relation between the independent and dependent variable is no longer significant, Detailed explanation of this measurement is given in the methodology section.

Figure 1: Direct effect model in support of H1, H2 & H3

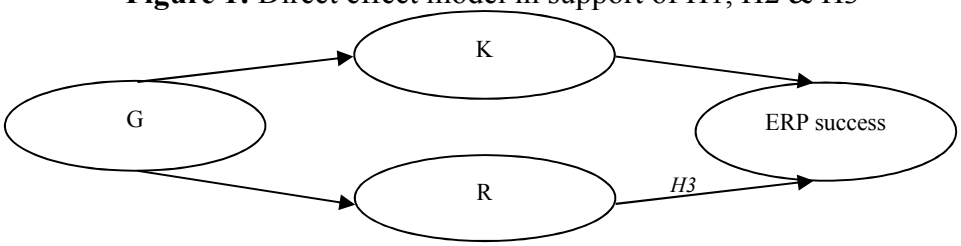


Figure 2: Mediating effect model in support of H4

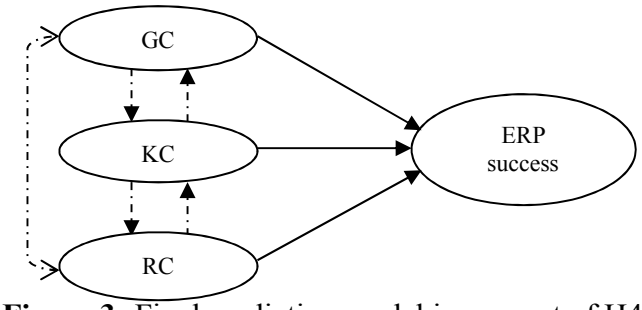
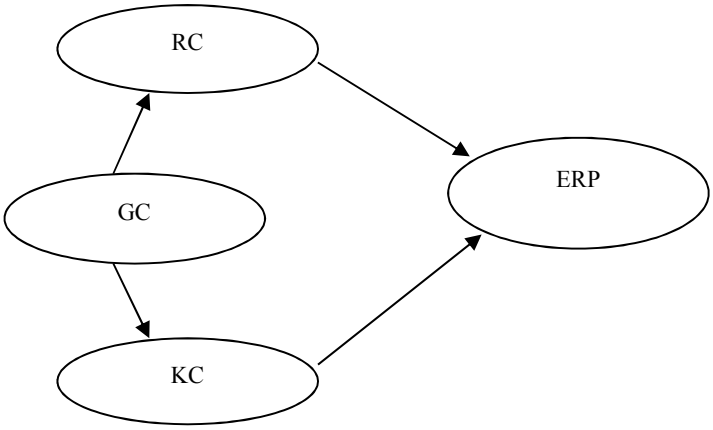


Figure 3: Final mediating model in support of H4



METHODOLOGY

A field survey of 488 service firms operating in Malaysia was conducted to test the research model. The sampling frame was obtained from a local ERP consulting agency. The primary respondents were senior executives in each firm.

The prospective respondents were first sent a pre-notification email regarding the survey and telephoned two weeks later to solicit participation. Four hundred and eighty eight firms indicated voluntary participation in the study. The survey questionnaire was mailed to the 488 firms in March 2009, with 90 firms responding to the survey, representing a response rate of 22.5% (90/400).

■Construct operationalization and scale development

All the constructs in this study were measured using multi-item, five point Likert scales. The knowledge related scales were adopted from Karimi et al., (2007), while the relationships scales were adopted from Stratman and Roth (2002). The governance scales were developed from several guiding literatures and further refined through a series of interviews with a group of experts consisting of three senior ERP consultants, four managing directors of service enterprises and three ERP project leaders. The dependent variable, ERP, comprised of three items: the geographical scope of ERP implementation, the functional scope of ERP implementation and the operational scope of ERP implementation. These items were adopted from Karimi et al., (2007). Table 1 provides an overview of the key constructs and their final measures.

Table 1: Overview of key constructs and associated measures

Construct	No of items	Items	Representative or guiding references
Knowledge	5	1. Knowledge sharing between departments 2. Project management tools & techniques 3. Engagement of capable and experienced project champion 4. Engagement of experienced consultants 5. Transfer of ERP technical knowledge to project team	Karimi et al., (2007)
Governance	5	1. IT infrastructure auditing 2. Operational and financial risks review 3. IT security review 4. Unauthorized access to firm's knowledge 5. |ERP project's financial budgets	Benroider (2008), Control Objectives for Information Technology (COBIT)
Relationships	5	1. Employee acceptance for ERP system adoption 2. Employee involvement in ERP project 3. Relationship between ERP project team members 4. Interactions between consultants and project team members 5. Relationship with our suppliers and clients	Stratman, and Roth (2002)
ERP	3	1. Geographical scope of implementation: single site; multiple sites; national; worldwide 2. Functional scope of implementation: Accounting/Finance; Manufacturing; Planning; Human Resources; Sales & Distribution; Logistics; Others 3. Operational scope of implementation: Department; Division; Entire company; Multiple companies	Karimi et al., (2007)

EMPIRICAL RESULTS

In order to evaluate the appropriateness of the measurement models for the latent constructs, we leverage on the recommendations provided by Fornell and Bookstein (1982) and employ the Partial Least Square (PLS) modeling approach. PLS was chosen over other structural modeling procedures due to the following reasons. First, the ordinary least squares characteristics inherent within PLS suits best to an exploratory research such as the present study. Second PLS is appropriate in research using new or modified measures. In this study, the governance capability measures were newly developed based from the literature. Third, PLS conducts simultaneous analysis for both the measurement model and the structural or theoretical model. In our study, governance (GC), knowledge (KC) and relationships (KC) capabilities are reflective while ERP is a formative construct comprised of three items previously described and adopted from Karimi et al (2007).

■ Test for common method effects

In this study, we rely upon single respondents from each sample firm to inform on the sought information. However such an approach often constitutes the risk of common method biasness (Ganster, Hennessey, and Luthans, 1983). To test for existence of such risk, we employ the Harman single factor evaluation method developed by Podsakoff and Organ (1986). This technique specifies that the individual measures for each construct be loaded into an exploratory factor analysis to identify if the first extracted factor accounts for the majority of the variance amongst all measures (Anderson, Covin, and Slevin, 2009, p. 228). If all measures converge into one single dimension, common method bias will be a concern to consider in this study. The single factor test using EFA produced three factors with eigenvalues of more than one. This implies that the presence of common method risk is immaterial in this study.

■ Descriptive statistics

The majority of the responding firms represent a variety of industries including financial services, telecommunications, engineering services and IT services. The majority of the firms were in business for less than 5 years (56%) with 53% of firms having earning capacity of less than USD200, 000 per annum. Close to 54% of the firms indicated spending an average of USD1.5 million for the ERP project, with a majority (53%) of them implementing the software in less than a year.

■ Measurement model assessment

In accordance with PLS protocol (Chin, 1998), the robustness of the reflective measurement scales was evaluated by:

a. Assessing the convergence of the scales, with the factor loadings higher than 0.70
b. Measuring the internal consistency of the reflective scales by looking at the composite reliability value higher than 0.60.
c. The average variance extracted (AVE) higher than a 0.50 threshold.
d. The discriminant validity of the model. This is achieved by computing the square-root of the AVE value. If the computed value (AVE^2) is above the correlation values, then the latent variables are statistically valid.

Tables 2 and 3 present the measurement model assessment outcomes for the direct effect model while Tables 4 and 5 show the outcomes for the mediating effect model. The results shown in these Tables suggest that the convergence of the scales used in the study are valid as all the factor loadings are above 0.70 in both models. A similar scenario is seen for the internal consistency (composite reliability higher than 0.60) and higher than 0.50 AVE values. The discriminant validity of both measurement models is also satisfactory.

Table 2: Convergence, Internal Consistency Assessment and AVE for Direct Effect Model

Construct	Final items	Valid Scales	Factor loading	Composite Reliability	AVE
KC	2	Q2. Project management tools & techniques Q5. Transfer of ERP technical knowledge to project team	0.76 0.77	0.74	0.58
GC	2	Q2. Operational and financial risks review Q4. Unauthorized access to firm's knowledge	0.78 0.70	0.71	0.55
RC	3	Q2. Employee involvement in ERP project Q3. Relationship between ERP project team members Q5. Relationship with our suppliers and clients	0.78 0.84 0.79	0.85	0.65

Table 3: Discriminant Analysis for Direct Effect Model

Construct	1	2	3
Knowledge capability	**0.74**		
Governance capability	0.63	**0.76**	
Relationship capability	0.29	0.26	**0.80**

Table 4: Convergence, Internal Consistency Assessment and AVE for Mediating Effect Model

Construct	Final items	Valid Scales	Factor loading	Composite Reliability	AVE
KC	2	Q2. Project management tools & techniques Q5. Transfer of ERP technical knowledge to project team	0.64 0.67	0.71	0.55
GC	2	Q2. Operational and financial risks review Q4. Unauthorized access to firm's knowledge	0.81 0.66	0.73	0.58
RC	3	Q2. Employee involvement in ERP project Q3. Relationship between ERP project team members Q5. Relationship with our suppliers and clients	0.84 0.80 0.76	0.84	0.64

Table 5: Discriminant Analysis for Mediating Effect Model

Construct	1	2	3
Knowledge capability	**0.74**		
Governance capability	0.66	**0.76**	
Relationship capability	0.33	0.25	**0.80**

■Structural model assessment

The structural model designed in this study is evaluated using three criterions:

(a) The R^2 of the model. Chin (1998, p. 323) suggests that R^2 of 0.67, 0.33 and 0.19 represents substantial, moderate and weak structural model, respectively.

(b) The estimates of the path coefficients need to be statistically significant and are shown via the bootstrapping procedure.

(c) We also evaluate the t^2 for the effect size. Effects size of 0.02, 0.15 and 0.35 indicates a weak, medium or large effect of the predictor latent variable on the structural model, respectively. This estimation will be shown for the mediating model only.

The R^2 of the direct effect model is 0.215, representing a weak structural model. The bootstrapping procedure for this model (refer to Table 6) implies that structural link emerging from GC → ERP is not statistically significant ($\beta = 0.13;\ t = 0.78$). The result suggests that the hypothesis of governance capability having a direct effect to ERP implementation success is not supported (H1). A similar result is observable for the path relationship between KC → ERP ($\beta = 0.12;\ t = 1.59$), indicating rejection of H2. The RC on the other hand has a positive and significant structural link with ERP ($\beta = 0.33;\ t = 5.73;\ p < 0.001$), thus H3 is supported.

Similar to the direct effect model, the R^2 of the mediating effect structural model is also weak (0.205). Estimation of the mediating model requires several tests to identify the optimum mediating path relationships between the three intangible capabilities. This study found that the structural link emerging from GC to the other two capabilities to be the best achievable outcome. Such decision is supported by the measurement of this path's large effect size of 0.35, which was computed based on the formula: (R^2 *included* – R^2 *excluded*) / (1-R^2 *included*) (Ringle, 2008).

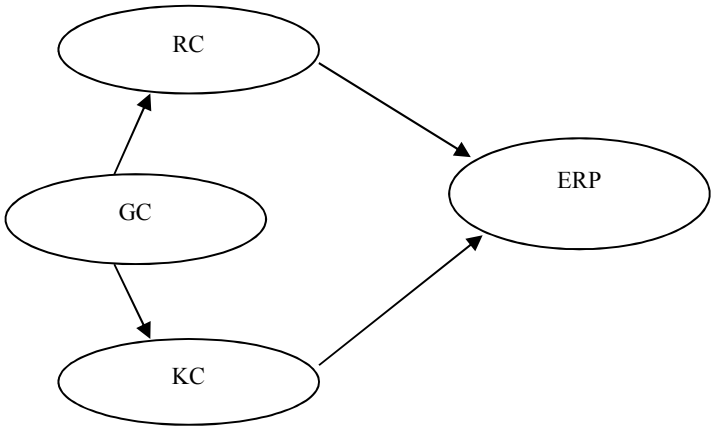
As shown in Table 6, there is a significant structural path emerging from GC to KC ($\beta = 0.66;\ t = 13.73;\ p < 0.001$), which reinforced KC's significant effect toward ERP ($\beta = 0.19;\ t = 3.57;\ p < 0.05$). In the direct effect model previously, KC had no significant effect toward ERP implementation success, but mediation caused by GC seems to have a different effect. GC has a significant link with RC ($\beta = 0.33;\ t = 3.48;\ p < 0.001$). The effect of RC toward ERP is significant ($\beta = 0.36;\ t = 5.67;\ p < 0.001$), although the strength is marginally lower than RC's individual effect on ERP. These results suggest that H4 is supported. The updated research model based upon the estimations is shown in Figure 3.

Table 6: The structural path model results

Paths hypothesized relationships:	Direct model	Mediating model
	$R^2 = 0.22$	$R^2 = 0.21$
GC → ERP (H1)	0.13 (1.78)	NA
KC → ERP (H2)	0.12 (1.59)	NA
RC → ERP (H3)	0.33 (5.73)***	NA
GC → KC; KC → ERP (H4)	NA	0.66 (13.73)*** 0.19 (3.57)***
GC → RC; RC → ERP (H4)	NA	0.33 (3.48)*** 0.36 (5.67)***

Note: *** $p < 0.001$

Figure 3: Final mediating model in support of H4



CONCLUSION AND POLICY IMPLICATIONS

Enterprise resource planning (ERP) system is well-acknowledged as one of the central technological infrastructures that facilitates business operations and growth in a dynamic business landscape. Adoption of the system however is mired with numerous problems, a well cited reality in multitude industrial and academic reports. In this study, we use the dynamic capabilities theory to examine the effects of Malaysian service firms' using intangible resources use toward their ERP system implementation success. Results from the Partial Least Square (PLS) estimation indicate that the direct effect of relationship capability to ERP implementation is more ubiquitous and significant than knowledge and governance capabilities.

The mediation effect shows that governance capability mediates and enhances the effects of knowledge and relationship capabilities toward effective ERP system implementation. Results suggest that achieving successful ERP implementation lie at the firms' capacity to integrate and reconfigure their intangible capabilities to create synergistic effects.

More precisely, in the context of this study, effective management of governance processes relative to operational and financial risks and access to firm knowledge, are important to complement and strengthen relationship management processes between employees, project team members and suppliers and clients. Governance mechanism also reinforces the effectual utilization of project management tools and techniques as well as knowledge accumulation and sharing routines for the ERP project.

The findings of this research have both theoretical and practical contributions. Theoretically, this research is amongst the first to use the dynamic capability lens to explore the individual and combined effects of different intangible resources and its associated processes or routines toward ERP system implementation success. In line with this theory, the results imply that successful ERP adoption is not reliant on the exploitation of any one particular firm resource per se. Such a '*static'* technology management practice may not be relevant in the context of a complex and multi-facet system such as ERP. Successful implementation of the system requires a dynamic management focus that leverages on the co-presence and integration of key intangible resources with reinforcing characteristics. A '*non-static'* management approach could strengthen the strategic impetus of leveraging on advanced technological applications such as ERP, to gain improved and sustained business performance.

From the practical standpoint, this study highlights the importance of the processes or routines related to governance, knowledge and relationships, in successful ERP implementation. Service firms adopting ERP system would need to focus and build upon stringent governance mechanism for other intangible resources to play effective role. Without sound governance mechanism, the relationship and knowledge accumulation and sharing activities may not work well, thus leading to poor or failed ERP system implementation.

Future research is supported in this area to validate further these results. Perhaps, extending it this research to apply it to various sectors of the economy is a good start. Additionally, this research is

also appropriate to be applied to other part of the world. However, this should be treated with extra cautious as ERP systems application may differ from countries to countries, and it is not a good idea to generalize the outcome of this research to the rest of the world. Using heterogeneous sample size from different countries may be is not appropriate and can lead to unreliable outcomes.

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