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Organization Factors for ERP Projects in a Developing Country: A Case Study Jordan

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Abstract

The organization factors integral to the successful implementation of ERP systems are identified in this paper, and the organization factors under scrutiny include: Change Management, Business Process Management, and Top Management Support. Survey questionnaires were circulated to ERP users in companies in Jordan, which led to the collection and analysis of 314 responses in total. The results evidence significant relationship between change Management and top management support with ERP implementation success. However, the outcomes did not support the relationship between Business Process Management and ERP implementation success. This study could assist ERP vendors and consultants in developing countries in preparing certain strategies for dealing with the oddity between their ERP products and ERP adopting organizations. Also, both ERP adopting organizations and managers could attain awareness regarding the intricacies that are inherent in ERP installations in order to prevent obstacles while increasing the possibility of attaining the looked-for results.

Keywords: business process management, ERP, top management support, change management, BPR, developing country, Jordan

1. Introduction

For the majority of enterprise resource planning (ERP) adopters, systems of ERP would improve operations particularly with regard to speed and value which decreases uneconomical costs. Systems of ERP integrate functions, divide businesses pertaining to information exchange and flow, and integrate diverse business functions such as accounting, operations, finance, sales, human resources, customer information, marketing, and supply chain as well. ERP is beneficial and yet, there are issues associated with it. For instance, Zhang et al. (2005) reported that on average, ERP projects were over budget 178%, took 2.5 times longer than the anticipated time to complete, and delivered only 30% of the guaranteed benefits. Hence, some studies (e.g., Dezdar & Ainin, 2010; Dezdar & Sulaiman, 2009) stressed the importance of finding out the factors that contribute to successful implementation of ERP systems.

As ERP has high failure level, factors that encourage the success of ERP implementations need to be identified. Also, there should be more effort towards ERP projects in developing regions/countries considering that these regions/countries signify a massive prospective ERP market with enormous pool of companies (NGAI et al, 2008). In the meantime, a gap in the literature has been identified by Finney and Corbett (2008) in the sense that the strategic factors in the successful management of an ERP implementation project have to be identified. Thus, this research attempts to find out the strategic CSFs for the successful ERP systems implementation in the context of Jordan, through a large scale survey.

Within the market of software, the enterprise resource planning (ERP) systems segment has been among the quickest expanding segments in the last decades, and these systems have been among the most integral developments in the context of information technology. As demand has been strong, countless of ERP systems have been made available, equipped with diverse technologies and philosophies. Notably, the market of ERP is very fragmented.

Software manufacturers, vendors, and systems are countless. Hence, it is important that enterprises find the most suitable software if they desire to implement ERP systems. Further, Winkelmann and Leyh (2010) added that enterprises need to have the awareness of the factors impacting the success of the implementation project. As such, in the adoption and implementation of a new system or in the upgrade or replacement of the present system, the critical success factors (CSFs) must be taken into account. This is to prevent errors that could occur during selection, implementation, or after the implementation of ERP systems while also preventing the inappropriate ERP systems, as these could lead financial disadvantages or calamities, or even insolvencies, as have been illustrated in some studies including Barker and Frolick (2003) and Hsu, Sylvestre and Sayed (2006).

2. Review of the Literature

Critical success factors (CSFs) greatly affect the achievement of organizational goals, and they are also crucial in the general success of the implementation of ERP system. CSF is an approach that eases the recognition and prioritizing of factors which could impact the success of ERP implementation. The critical elements, if discovered and managed in accordance with their respective constituents at the ERP implementation project, would contribute to the implementation success. With respect to the implementation of ERP, CSFs comprise those conditions to be fulfilled for the success of implementation process. However, Zhang et al. (2005) stated that within the ERP literature, factors that are needed to successfully implement, or that could cause failure, differ.

For ERP projects, the CSFs have been examined in various viewpoints. In this regard, a lot of scholars have brought forth diverse factors which could be deemed critical to successful ERP implementation. For instance, the work of Holland and Light (1999) addressed the strategic factors that span the entire project and tactical factors applicable to certain parts of the project. Meanwhile, in the work of Al-Mudimigh et al. (2001), the CSFs of ERP were classed based on strategic, tactical and operational groups. In examining the CSFs for the implementation of ERP, Finney and Corbett (2007) identified the critical success factors based on the CSFs highlighted in the literature and have these factors classed into strategic and tactical groups.

2.1 Critical Success Factors of ERP Implementation Success

Finney and Corbett (2007) defined a critical success factor for ERP projects as any condition or element viewed as essential for the success of ERP implementation. The literature review was performed primarily for achieving a comprehensive knowledge regarding the different CSFs that other researchers have identified.

Several works were identified, and these papers brought forth single or multiple case studies, surveys, reviews of literature or articles. From these papers, the identified CSFs are Change Management, Top Management Support, Business Process Management, and ERP System Configuration as detailed below.

Change Management: The factor of change management comprises the initial involvement of all individuals that are impacted by a process of change so that resistance against these changes can be reduced. Here, among the crucial components include sufficient training particularly pertaining to the IT-department, in addition to early communication of the changes so that employees could react (Al-Mashari & Al-Mudimigh, 2003). The strategies of change management manage the cultural and structural changes in the entire firm. Training and education of employees using many ways is thus important. As such, the aim of change management is not merely to avert rejection and support acceptance, but also to generate understanding to the employees and make them desire the changes. It is important to have the employees involved in the planning and implementation at the early stage of the process so that this understanding could be attained. In addition, there should also be a support team during user training. The support team provides clarification and responds to questions on new processes and functions. Also, another assessment with end users should be carried out following the "go live." This, according to Loh and Koh (2004), is to find out problems while also preventing disagreement.

Top Management Support: Achanga et al. (2006) highlighted this factor as among the most essential factors for ERP implementation. According to Finney and Corbett (2007), dedicated leadership from top management underpins the unremitting success all projects. Hence, employees would show better acceptance towards innovations, especially new technologies if top management endorses them. Prior to the initiation of the project, challenges and also the irregularities of the planned ERP implementation have to be identified by top management. A lot of the decisions that are made during the project impact the entire enterprise. Hence, these decisions are usually made by senior managers only, and as indicated by Becker et al. (2007), will necessitate maximum acceptance and commitment by employees. The allocation of the needed resources, the making of fast and effective decisions, the resolution of conflicts which require acceptance from the whole enterprise, and reaching and supporting a co-operation of every department, need commitment from top management (Al-Mashari et al. 2003; AL-Zoubi, 2016).

Business Process Management: Business Process Management (BPM) is a phase in ERP projects that is deemed as important. However, as indicated by Kumar et al. (2003), BPM frequently causes postponements in implementation of ERP. All through ERP projects, companies are required to go through their business processes, and delve into fresh methods of performing things pertinent to best practices which have been set within the ERP system. As stated by Francoise et al. (2009) and Rajagopal (2002), a review that is more in-depth and more detailed will generate superior BPR outcome. Remus (2007) indicated that the execution of change pertaining to activities and workflows in processes of business before, during, or after the implementation of ERP may cause a dissimilar and minimized level of ERP system configuration. Minimizing the degree of ERP system modification is worthwhile as it would decrease errors and allows company to easily benefit from the latest versions and releases. Hence, Therefore, Rosario (2000) suggested that the project team or top management makes the decision on how far company has to modify their processes of business so that they correspond with the ERP system.

ERP System Configuration: The preliminary ERP system version is grounded upon best practices. Hence, in each project of ERP implementation, the system has to be configured or adapted in accordance with the processes of business. As such, for companies, Esteves and Pastor (2000) mentioned the importance of adopting the process and options established into the ERP as much as possible, instead of trying to make modification. In fact, Hong and Kim (2002) stated that the more considerably the original ERP software is changed, that is, even beyond the "normal" configuration, the lesser the chance is for a successful implementation project. This is the reason why Esteves and Pastor (2000) perceive the usefulness of a good vision of business; because it decreases the effort relating to seizing the functionality of the ERP business model which in turn minimizes the necessitated impact for the configuration. Extensive modifications made to the system will lead to problems associated with implementation and adversely affect system maintenance. Hence, Loh and Koh (2004) suggested that lesser adjustments decrease the effort of incorporating new versions, releases or updates.

3. Research Framework and Hypotheses Development

3.1 Research Methodology

The methodology that this study has chosen to apply is discussed in this section. This methodology comprises the study's research model, operational definitions for both the independent and dependent variables, research hypotheses, instrument to gather data collection, as well as research population and sample.

3.2 Research Model

In this research, the establishment of the primary elements follows the extant literature, empirically and theoretically, whereby the variables commonly associated with organization factors are employed. Accordingly, Figure (1) highlights this study's model comprises: Business Process Management, Top management support, and Change Management as the independent variables as follows, ERP as the dependent variable, and the conjectured relationship between them.
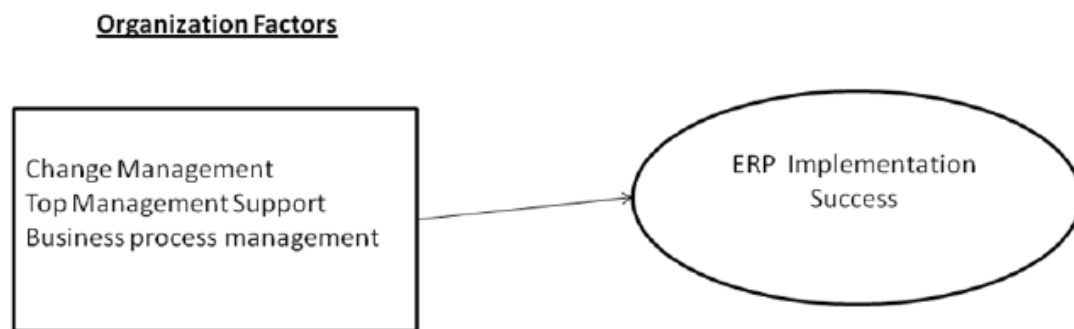
Figure 1. ERP implementation success model

3.3 Operational Definitions

As mentioned, there are three independent variables in this research namely: Business Process Management, Top management support, and Change Management). Meanwhile, ERP is the dependent variable.

Many authors including Al-Mashari et al. (2003), Umble et al. (2003) and Zhang et al. (2005) emphasized top management support as major factor in successful ERP implementation. For instance, Ngai et al. (2008) found top management support to greatly contribute in the success of ERP implementation because in general, ERP is

considerable in size and requires extensive resources. In measuring top management support, four items adapted from Zhang et al. (2005) and Umble et al. (2003) are used.

Change management entails human resource management and social changes that top management requires during the introduction of new processes and structures for the purpose of preparing the people in the acceptance of changes while also reducing these people's reluctance towards those changes. Two items are used to measure change management. These items are adapted from Harmon (2007).

Business processes are dispersed within the organizational bounds. Hence, prior to reengineering, the fundamental business processes have to be first identified. In this regard, Hammer and Champy (2003) proposed the use of a process map, akin to the usage of organization charts, with well-defined business processes in order to ease the comprehension and sharing of the workflow the company. Two items are used to measure Business Process Management. These items are adopted from Kovacˇicˇ and Bosilj-Vuksˇic´ (2005) and Hammer and Champy (2003).

Meanwhile, the dependent variable in this study which is ERP implementation success is measured using two items adapted from Ifinedo (2008) and Damijan et al. (2009).

3.4 Research Hypotheses

This study attempts to test the proposed research model which illustrates the impact of Business Process Management, Top management support, and Change Management, on ERP (see Fig 1). For the purpose, the hypotheses below will be put to test:

H1: Change Management is positively related to ERP implementation success.

H2: Top management support is positively related to ERP implementation success.

H3: Business Process Management is positively to with ERP implementation success.

4. Data Analysis and Findings

The respondents' characteristics are highlighted in Table 1 and as can be observed from the table, the respondents had good amount of experience and were highly educated. The respondents were also aware of the processes relating to the business and company, in addition to the implementation projects of ERP. In other words, the respondents were able to provide valuable information for the study.

Table 1. characteristics of the respondents

Measure	Categories	Frequency	Percent	Cumulative (%)
Gender	Male	251	80	80
	Female	63	20	100
Age	Below 30 years old	39	12.4	12.4
	31-40 years old	102	32.4	32.4
	41-50 years old	109	34.7	34.7
	Over 50 years old	64	20.4	100
Education	Undergraduate	48	15.3	15.3
	Graduate	179	57	57
	Postgraduate (MS)	75	23.9	23.9
	Postgraduate (PhD)	12	3.8	100
Employment with this company	Less than 3 years	26	8.2	8.2
	3-5 years	57	18.2	18.2
	6-10 years	99	31.6	31.6
	More than 10 years	132	42	100

The measurement model was evaluated in this study and the evaluation included the convergent and discriminant validity. Accordingly, Table 2 presents the convergent validity test outcomes. As the table is showing, the measurement model items have factor loadings higher than 0.70 and the item each loaded significantly (p < 0.01 in all cases) on its underpinning construct. In addition, the composite construct reliabilities appear to be within the commonly tolerable range which is higher than 0.70. With respect to average variances extracted, all were greater than the proposed level of 0.50. This means that each constructs carries sufficient convergent validity as Hair et al. (2006) had proposed. Further, as shown in Table 3, the convergent validity test outcomes demonstrate that the constructs share more variances with their indicators rather than with other constructs.

Table 2. convergent validity test

Construct	Items	Factor Loading	Composite Reliability	Average Variance Extracted
Change Management	CM1	.817	.810	.674
	CM2	.746		
Top management support	TMS1	.816	.813	.673
	TMS2	.747		
	TMS3	.756		
	TMS4	.718		
Business Process Management	BPR1	.872	.939	.754
	BPR2	.878		
	BPR3	.873		
ERP implementation success	ERP1	.855	.853	0.734
	ERP2	.874		

Table 3. discriminant validity test

Construct	CM	TMS	BPM	ERP
Change Management (CM)	**.755**			
Top management support (TMS)	.538	**.876**		
Business Process Management (BPM)	.550	.574	**.868**	
ERP implementation success (ERP)	.628	.722	.498	**.846**

Note. Leading diagonals represent the square root of the average variance extracted between the constructs and their measures, while off diagonal entries are correlations among constructs.

This study used AMOS 17.0 software in the examination of the proposed structural model. As shown by the outcomes, the normed $\chi2$ was 2.564 and this obtained value is within the suggested level of 3.0. Meanwhile, RMSEA was 0.065 which is lower than the suggested cut-off of 0.08, whereas CFI was 0.925 which is higher than threshold value of 0.90. The structural model hypothesized generally shows an adequate fit for the data. Figure 2 highlights the results of SEM path, standardized path coefficients and t-values of all hypothesized relationships. As shown, SEM analysis results are in support to the Hypothesis 1 (MC to ERP) (β=0.061, p= 0.017) and Hypothesis 2 (TMS to ERP) (β=0.394, p<0.002). On the other hand, Hypothesis 3 is not supported as the coefficient of BPM to ERP shows non-significance (β=-0.129, p=0.335) which does not support.
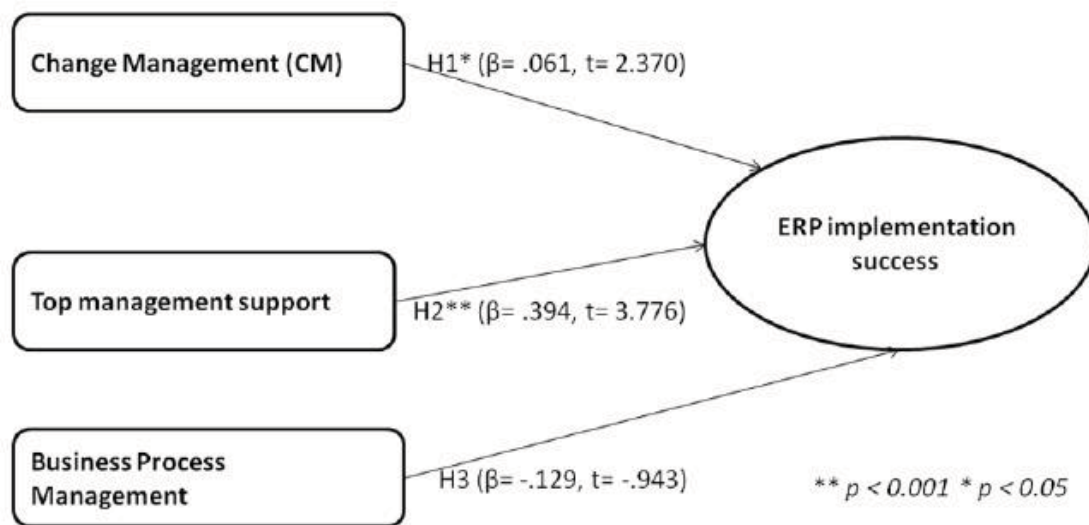
Figure 2. Path analysis results for ERP implementation success model

5. Discussions

The outcomes obtained in this work are affirms the positive relationship between change Management and the success of ERP implementation. For organizations wishing to adopt ERP, they should have clear scope of ERP implementation project, ability to control it all through the project, and be assured that requests of scope expansion are meticulously evaluated prior to approval. This is necessary in the provision and establishment of a comprehensive project plan with well-defined objectives, deliverables, reasonable project goals and end-dates, in addition to their enforcement with quantifiable outcomes.

The positive relationship between top management support and ERP implementation success is also affirmed in this study. This implies the importance of Top Management's involvement in ERP implementation in every step. It is also important that Top Management shows commitment in the allocation of valued resources to the implementation effort. Furthermore, top management should explicitly identify the project as a primary concern, establish the appropriate and capable project team, and share the role of new systems and structures in the entire organization. Top management should adequately function as or assist the executive committees in monitoring the implementation project and team as well.

Lastly, a formal management process has to be available in order to enable the periodic tracking and monitoring of the project progress. It should be noted that this study does not affirm the positive relationship between business process management and the success of ERP implementation. In this regard, inadequate experience among BPR consultants was found to be the major hindrance to BPM projects in Jordan. In addition, governmental rules and regulations were too many, and they can neither be changed nor eradicated. As such, firms that wish to use ERP are obliged to carefully assess and choose the ERP package. The selection of ERP system should be in accordance to the best fit, or compatibility with the procedures of the present business. Furthermore, change in the organization should be progressively attained by utilizing business process improvement which entails evolutionary changes. It is thus a more fitting attempt of reengineering in developing nations such as Jordan.

6. Conclusions

This study is of value as it enhances to the academic research by presenting the empirical evidence to lend support to the theories of critical success factors and the implementation success of ERP. The reservoir of knowledge regarding ERP implementations particularly in the context of developing countries is also expanded by this study. Furthermore, a research model that this study presents may be tested in other Asian, Muslim and developing countries in terms of its applicability. In addition, this study is among the few that explore ERP implementation success from the viewpoints of important stakeholders. Noteworthy managerial implications are also found in this study. At the same time, the assumption that best practices entrenched in foreign ERP applications will automatically be applicable to developing nations should be made with caution.

The results obtained in this work are of value to vendors and consultants of ERP in their formulation of certain strategies in dealing with the incongruity between their ERP products and ERP adopting companies, in the context of developing countries. Furthermore, the revealed experiences can be perused by other developing countries that have identical settings, in this context, such as, the Middle-East, North Africa, Muslim countries and other developing countries. The Middle-East, North Africa, as well as other Muslim countries should in fact be studied in this context. For successful ERP implementation, this study concentrated on the strategic organizational CSFs. Hence, future works may consider looking into the environment and technical CSFs. Also, for future works, the questionnaires may be distributed to different groups of respondents including users, chief information officers, and team members of ERP project.

This study notes the limitations pertaining to the literature review. Firstly, this study could not provide assurance that the papers pertinent to the subject under study have all been reviewed. In this study, five databases and five international conferences were selected. This means that the journals that are not included in the selected databases and conferences may also contain articles relevant to the subject under study. The CSFs coding is a limitation as well but this subjectivity has been reduced in this study by the creation of coding rules and also through the discussion with three neutral researchers. As such, CSFs may be coded differently by other scholars.

For the reproduction or repetition of this study's procedure, the list of identified papers from each step can be obtained from the author.

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Global Crisis, Innovation and Change Management:
Towards a New Systemic Perception of the Current Globalization Restructuring

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Abstract

The "crisis of capitalism" is not, of course, an unprecedented discourse in the evolution of economics and the investigation of economic realities. In Neo-Schumpeterian economics crises constitute necessary evolutionary steps, intrinsically linked with breaking 'moments' and change. However, what makes the current crisis clearly different, and to a large extent subversive, is its ever increasing complexity and evolutionary-dialectic substance. The mixing of cooperation and competition, on an organizational and macro-economic level, reproduces on a global scale the need for a reconsideration of basic economic mechanisms. It tends to undermine and rapidly destroy the mechanistic relations and structures of all kinds and dimensions that have managed to provide profitability and effectiveness over the recent years. In this context, the search for strategic innovation, constant organizational renewal and the diffusion of production oriented at high technological expertise, seem to progressively become the critical synthetic components for building a new development model at all levels and for all agents of action.

This paper focuses on the introduction of a three tier question which could be put forward as follows. First we ask what is the current global restructuring crisis and what would be a new growth model that would lead us to the exit of it on a global scale. Second we address the issue of what kind of innovation mechanisms does such a new model of interspatial restructuring and development require. Finally we analyse why is this new innovative direction—both in global terms and in individual socioeconomic systems—a prerequisite for building new types of effective change management mechanisms.

The starting point of our approach is the position that any fragmented approach in the individual aspects of the triangle of global crisis, innovation, and change management, is now analytically misguided and practically powerless. Only an effort to systemically understand the phenomenon, in its constant and dialectic structure, is now an adequate condition for outlining the future developmental path of globalization at all levels of action.

Keywords: change management, global crisis, globalization, innovation, realistic innovative liberalism, Stra.Tech.Man analysis

1. Introduction: The Dialectical Connection between Global Crisis, Innovation, and Change Management

The central task of this research is to focus on studying the closely related evolutionary interconnection of three fundamental dimensions/pillars of modern reality, namely the global economic crisis, innovation and change management, as these unfold at every level of action (Amable, 2000; Amable, 2002; Aglietta, 2008; Aoki, 2001; Artus, 2001; Boyer, 1986; Boyer, 2002; Coriat, Petit, & Schmeder 2006; Esping-Andersen, 1990; Esping-Andersen, 1999; Gadrey & Jany-Catrice, 2012; Stiglitz 2003a). This paper delves into the structural core of every organization, strategy, technology, and management (Stra.Tech.Man) which, in a deeper sense, shapes and mobilizes them (Vlados, 1996; Vlados, 2005; Vlados, 2007; Vlados, 2012; Βλάδος, 2006; Βλάδος, 2016; Βλάδος, 2017). In particular, we lay down this analysis on the interconnection level between global crisis, innovation and change management, which are required to overcome the first, in a process of global restructuring, towards a "new globalization" (Aglietta & Rebérioux, 2004; Aglietta, 1998; Artus & Virard, 2015;

Boltansky & Chiapello, 1999; Braudel, 2014; Brender & Pisani, 2009; Chavagneux, 2011; Curien, 2000; Dobbs, 2015; Reich, 1993; Rifkin, 2002). In particular, we argue here that these three critical dimensions in the years of late modernity have been erroneously seen as unrelated, independent and self-explanatory, thus favoring a conceptual autonomy. In this paper we are facing the three most critical dimensions of modern reality, which—quite incorrectly, according to the alternative view we propose—are usually considered in modern literature as being unrelated, independent and self-explanatory—in their conceptual autonomy. An effective consideration, on the contrary, we think, is precisely one that opposes this fragmentary and analytically disruptive logic (Aglietta & Orléan, 1982; Aglietta & Orléan, 2002; Aglietta & Brender, 1984; Benassy, Boyer, Gelpi, & Lipietz, 1977; Billaudot, 1996; Billaudot, 2001; Boyer, 2004; Boyer & Freyssenet, 2000; Chavance, 2012; Coriat, 1979; Coriat, 1994; Delorme & André, 1983; Dulong, 2012; Lahire, 2005; Lipietz, 1979; Lipietz, 1983; Lordon, 2002; Orléan, 1999; Petit, 2005). (Figure 1).
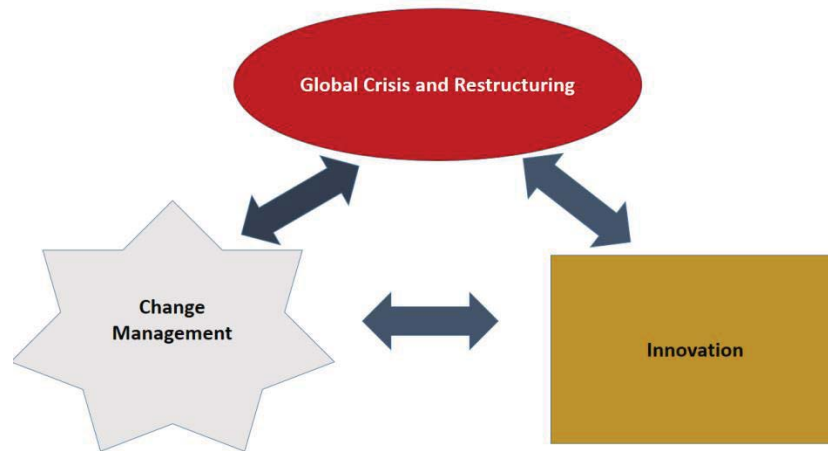
Figure 1. Global crisis and restructuring, innovation and change management

We consider that it is analytically misplaced and fruitless to try to approach any of these dimensions in the absence of the other two; you could never completely understand each of these spheres by looking at them separately one from another. As Tsoukas (Tsoukas, 2017) and other scholars recently argued, it is by bringing forward a complexification of concepts and by investigating social relations that may produce theoretical models that would link with real life and societal challenges. Consequently, the only way to conceive them all, in their analytical depth, is to explore them in their narrow evolutionary systemic interplay. In the next sections we will explore the various parts of this relationship.

2. Elements of Literature Review on the Global Crisis

What we have been experiencing since the end of the first decade of the 21st century is historically unique and profoundly subversive to the "regime of things" we have been accustomed to over the recent decades. Of all the places that have the power to shape the dominant political perception and act in the global economy, today, the findings seem to be almost unanimous: Nothing in the world appears to balance, now, like it used to in the past (National Intelligence Council, 2008).

It becomes obvious that we live in a complex context of crisis, of increasing liquidity and uncertainty. A variety of complex dynamic dimensions (economic, social, developmental, political, institutional, demographic, cultural, religious, energetic, climatic, geopolitical, and geostrategic) are interwoven and redefined inside the 'crisis' to an impressive extent and by now to a planetary level (Avant, Finnemore & Sell, 2010; Breslin, 2016; Carroué, 2004; Chauprade, 2007; Chavagneux, 2010; Cohen, 2008; Huntington, 2005; Kitchin, 1998; Lacoste, 2006; Lévy & Poncet , 2008; Luttwak, 1990; Mackinder, 1904). And in this fluid environment of the global crisis (Greenspan, 2008; Kotler & Caslione, 2009), nothing can be the same, now, with respect to the reality experienced over the past years (Adrian & Shin, 2008; Greenspan, 2004; Laudicina & Peterson, 2016; Prasad, Terrones, & Kose, 2008; Stiglitz, 2003b).

The emerging new globalization can be conceived to be born and reproduced by the diverse social and economic interconnections and flows that it creates and exploits. (Figure 2)
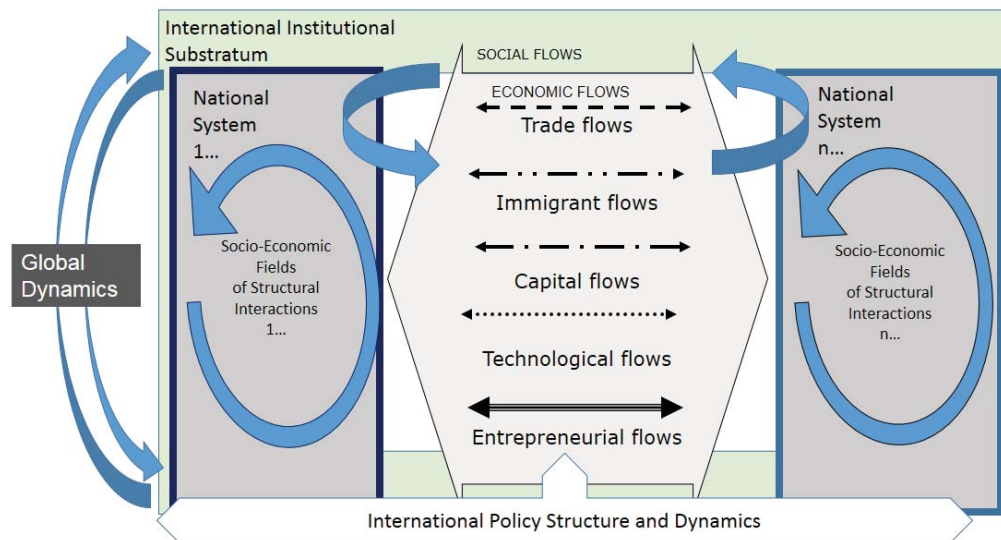
Figure 2. Global dynamics, international economic and social flows, international political structure and dynamics, and national fields of structural interactions (FSI)[1]

In this complex systemic framework, all sorts of globalizing flows and dynamics are integrated and operating. In the long run, if there were no special opportunities for the various factors of action to exploit—as well as differentiated threats—deriving from different values, fields and structures of any kind, then it would be pointless and even the very process of globalization would not exist.

2.1 The Concept of Crisis in Economic and Business Science and the Basic Theoretical Perspectives

In economics, although the concept of crisis is fundamental, at least since the time of Classical Political Economy, it does not cease to delimit a subject that is particularly shadowy and ambiguous (Amoore, 2002; Aydalot, 1984; Cohen, 2011; Overbeek & van Apeldoorn, 2012; Reinhart & Rogoff, 2009; Servet, 2010; Χριστοδουλάκης, 2012). In a deeper sense, we can say that there are two major "visual perceptions" and definitions of the notion of crisis: The conjunctural and the structural.

As a conjuncture, the crisis is perceived as something extraordinary, situational, as an occasional overthrow of the balance of facts/matters and ultimately as something "unnatural" but assimilable by the current system of things. Eventually, the crisis is a temporary social and economic construction that constitutes a breaking moment within an otherwise undisrupted normality (Bourdieu, 1999). The crisis arrives like a temporary fire that will eventually get extinguished and everything will go on like they used to. In this perspective, the crisis is considered to have an exceptional and unexpected character and is structured upon specific unspecified events—or a series of events—that lead to high levels of uncertainty and threat—or viewed as a threat—in relation to some high priority goals of an organization, of every level and kind.

Over the second category of perception and interpretation, in the structural, the crisis is considered a deeper situation, like something evolutionary necessary, something organic, historically irreversible, and as something that brings unavoidable changes to the system that it leans (Anderson, Arrow & Pines, 1988; Boulding, 1970; Brian, 1989; Kuhn, 1962; Le Moigne, 1990; Lefebvre, 1968; Lugan, 2010; Prigogine & Stengers, 1984; Prigogine & Stengers, 1986). Hence, in this way, the crisis is captured as something endogenous, inevitable, expected, and ultimately, normal. The crisis comes, is overcome and is once more overcome, but always by taking with it the "old status" of things. Nothing then goes on like before, under the previous "regime". In this approach, the "old regime" of things necessarily collapses and is replaced by a new one (Biel & Kho, 2009; McKeon, 1954; Popper, 2014; Postan, 1962; Spranzi, 2011). This conceptual consideration of the crisis refers to something that resembles not only the irreversible death of a system but also the inevitable birth of a new one: "the birth of the new and the death of the old" (Schumpeter, 1942). Here is the mutation which involves the irreversible changes that are placed within the logic of evolution. And here comes that situation where the rule is transformed, one class fades and another is formed (Passet, 1996).

Only in the second direction of understanding the concept of crisis, in its structural, historical and evolutionary perspective, could be recognized the structural and deeply subversive content that the crisis always conveys in every socio-economic system (Boyer & Durand, 1998; Boyer & Saillard, 1998; Mitroff & Silvers, 2009; Venette,

2003). This is also the main reason behind the growing interest in the reconstruction of economic science by some recent and old trends (Georgescu-Roegen, 2011; Rodrik, 2011; Tofler, 1970; Tofler, 1980; Tofler, 1990).

2.2 Approaches to the Current Global Crisis and the "New Globalization"

The global system has entered into a structural crisis and a somehow emergent remodeling, where over the next twenty to forty years, according to Wallerstein (Wallerstein, 2012), will result in a completely new system (or systems), which will either be worse than the existing ones or much better (Ahmad, 2013).

In a possible "new globalization" (El Namaki, 2017), a group of approaches tend to consider that the barriers are redeployed and become even more complex, while a lot more countries are dynamically involved and guide global growth. In this multipolar world (Pieterse, 2011), the trade growth is likely to decline, especially in commodities as well as in cross-border investments due to the protectionist forces. These rapid restructurings decentralize global supply chains, as the "computerization" which is absorbed by the new business ecosystems in a structural way is intensified. Economic policy is becoming increasingly sensitive to sudden and conjunctural changes by moving, most of the time, towards a direction in favor of nationalism and against shared global goals. In this context, there are also emerging opportunities for inter-state cooperation to institutionally change and to resolve rising threats such as cybercrime, international terrorism, and to deal with tax heavens across the globe (Bhattacharya, Khanna, Schweizer, & Bijapurka 2017).

The impact of globalization and free trade encompasses a lot of diversity; there are always different prospects per spatial level and business sector. So, it makes sense for the individual industrial and organizational policies to have a different focus on the incentives they give for development and modernization, as long as there are differences in terms of democratic stability, of management in public and local government and of their levels of corruption (Peters, Pierre & Randma-Liiv, 2011).

This phase of new globalization, since 2008 and about a decade earlier, represents the most expansive and technologically advanced form of globalization, with respect to all the previous ones. The prevailing analysis, however, is very often limited to mono-thematic theories of "neo-colonization" and exploitation (Milanovic, 2016), by referring especially to the poor regions of the world (Klay Kieh, 2008), and by omitting the systemic regulatory issues and the need for structural reforms. There are not, of course, few who claim that this is not a purely "new globalization" but a "new regionalization" where the complex interaction of these two phenomena is in a direction of both mutual exclusion and convergence (Hettne, Inotai & Sunkel, 1999). As Hirst and Thompson (Hirst & Thompson, 1999) argued, globalisation and global economic integration is organised in historical cycles that lead to decades of expansion followed by periods of contraction and regional centralisation.

According to some theorists, the new globalization is predicted to be a new regime of increasingly integrated production, while the former regime, the "old globalization", has been a phenomenon of rapid interconnection between the global and local markets (Margulesku, 2015). The diffusion of services makes the system a lot more complicated and, therefore, it is not possible to distinguish the boundaries between globalization and regionalization (Caselli, 2012; Vujakovic, 2010). The repeated appeal of the European Union's institutions—a union which represents the largest regional cooperation on the planet—is a typical example of the effort to manage globalization, already by globalization's early stages, by trying to explore and integrate relevant regulatory mechanisms (Siles-Brügge, 2012).

So, how is the global crisis going to influence the shaping of new power relations? What does it mean for the new globalization the decrease of the economic role that the US has had until recently? How is the lack of a truly global governance expected to shape the new national sovereignty (Grinin & Korotayev, 2010)? In this context, we realize that even in the field of international relations there is no absolute shift from the national to global level (Chandler, 2009). Instead, it seems like the very ideologies of globalization get re-codified (Steger, 2013) and even more elements of complexization are introduced to the system.

There are also appearing some "new rules" for sustainable development in globalization that tend to over-protect national interests and lead to a form of a "guarded globalization" (Bremmer, 2014). Also, in the new globalization there will be no rapid financial expansion (financialization) like in the previous phase (Philip, 2012). It seems that the power and privileges of knowledge and expertise will acquire a significant strategic role (Bresser-Pereira, 2010): The cognitive capital seems increasingly as the crucial structural block for the new global economic construction.

2.3 Structures, Behaviors, Returns, and Crisis, inside the Global System

In the systemic concept of global dynamics we could recognize the following co-determined dimensions, under a dialectical point of view:

❖ The structures that define the behavioural boundaries of the individual "players" and the behaviors that, in turn, determine the returns of each player, hence their survival and developmental potential.

❖ The players' returns during the crisis seem to declining drastically for a relative big number of players, by endangering at the same time their individual survival and development and also the respective potential of the whole system on a global scale. In this way, the global system reproduces its crisis.

❖ The global system, under certain conditions, is able to compose the necessary innovation as a way out of its crisis which, in turn, leads necessarily to the restructuring of the system's "structures" based on a successful change management, and which opens, consequently, a new cycle of development.

❖ Over the course of this uninterrupted process, every link of the chain determines and at the same time is determined by the underlying dynamics of the global system (Figure 3).
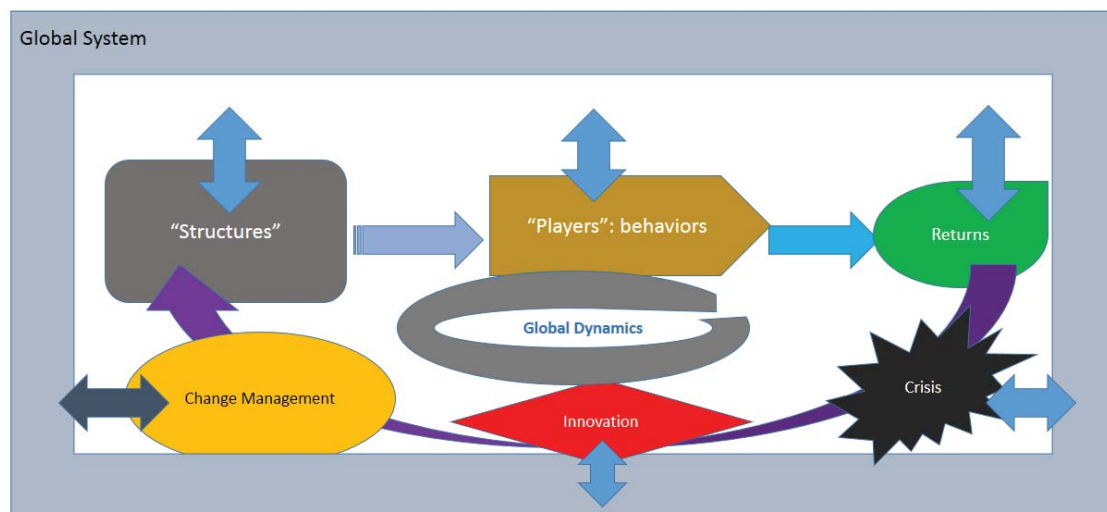
Figure 3. Structures, behaviors, returns and restructuring, inside the global system

However, besides these methodological clarifications, an effort toward a meaningful and valid understanding of globalization require a clear view of some certain key aspects and thematic challenges that the approaching new globalization carries within.

2.4 The Challenges of Globalization Restructuring

The public engagement concerning globalization, internationally, has almost exploded over the past thirty years. The concept of globalization has been accompanied—and still is—by passionate statements—usually against—which often lead to multiple political, social, ideological, and theoretical conflicts. And, most often, in those conflicts there is a completely paradoxical structure of "opposing camps" that is perpetuated (Abélès, 2008; Adda, 2012; Bayart, 2004; Bourg & Papaux, 2010; Cerny, 2010; Cooper, Hughes & De Lombaerde, 2007; Dembinski, 2008; Golub, 2011; Jaffrelot, 2008; Kunz, 2011; Lordon, 2009; Mattli & Woods, 2009; Orléan, 2009; Palan, 2000; Rainelli, 2011; Reinert, 2008; Sinclair, 2012).

The global crisis we currently experience is, in its essence, the birth of a continuous structural process of maturity and incubation. Like in every evolutionary phase of capitalism (Michalet, 1998), the ongoing global crisis has come as a structural destabilization result of the older development regime, on a global scale. This became a reality through a long chain of events that initiated, superficially, when the sub-prime loan markets collapsed and this turbulence spread everywhere, at all levels of socioeconomic relations. It is therefore clear that and this crisis has not "fallen from the sky", it is not something exogenous. On the contrary, it "established its roots and stepped over" the structural maturity of the "previous" globalization development model: a maturity, that is, which accomplished in the last three decades, since the mid-1980s up to the mid-2000s. (Figure 4)
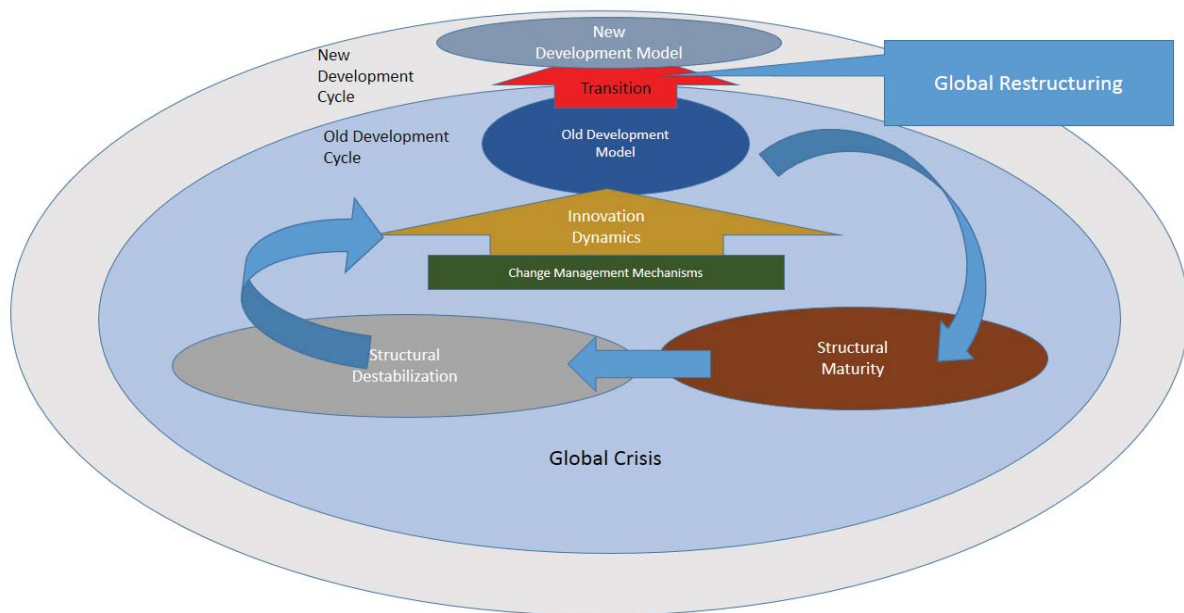
Figure 4. Global crisis and restructuring

In total terms, the formation of a "new globalization" is now called upon to give an answer to the ever intriguing questions of the evolutionary course of the global economy. The challenges which concern the rising future and the present, in our view can be distinguished in the following fundamental conflicting features of modern reality:

  i. Poverty versus wealth

  ii. Equality versus inequality

  iii. Real versus financial economy

  iv. Economy versus society, nature and humanity

  v. Freedom versus control

  vi. Uniformity versus diversity

In this basis, we consider that the shaping process of the new globalization is systematically determined by these new and sharp contradictions and challenges. In this dialectical process of globalization restructuring, there are many "diseases" and respective particular "treatments" dealing with them (Βλάδος, 2017: 127-176). To sum up, therefore, some critical "disease-treatment" pairs could be briefly presented as follows:

❖ The best treatment for poverty in any socioeconomic system, more or less developed, is away from a superficial and temporary growth and towards a structural socioeconomic transformation focused on a long-term developmental perspective.

❖ The best treatment for inequality is not some "exogenous aid" but the systematic empowering of equal opportunities to development, for all people and in every society.

❖ The best treatment for a braking of the financial exaggerations and speculation is to create a new effective regulatory framework on a global scale.

❖ The best treatment to combat the narrow "economism" is to understand there can be no lasting economic success over a degraded and declining social and environmental background.

❖ The best treatment to strengthen human freedom is to reevaluate and restructure the role of state intervention, by focusing primarily on increasing the development potential of every socioeconomic system.

❖ The best treatment for preserving diversity and heterogeneity on our planet is the constant effort of every society to protect the values of tolerance and pluralism.

As far as this view is concerned, undoubtedly, the "post-crisis of globalization" world—which struggles to emerge nowadays—requires drastic reorientations and deep structural changes in order to get consolidated and

prevail in evolutionary terms. All of those require, of course, a vast variety of innovations, and across every corner on our planet. Diagonally, through every hierarchical level, and cross-functionally, leaning on every institution and organism, either private or public, whether large and small.

It is, therefore, found that behind every major restructuring effort, there is a demand for new institutional knowledge, by having the innovation as source, and followed by the context of change management which produces that innovation: Here, ultimately, lies the essence, according to the theoretical view of this article.

3. The Contemporary Global Dynamics of Innovation and Change Management: Toward a New Research Model

A structural prerequisite of overtaking the global crisis is the production of innovation which is always connected to the procedures of change management that take place in every socioeconomic structure (Aghion, Bloom, Blundell, Griffith & Howitt, 2005; Amable, Barré & Boyer, 1997; Boyer & Didier, 1998; Brynjolfsson & McAfee, 2015; Carlino & Kerr, 2015; Freeman & Soete, 1997; Guo, 2017; Rifkin, 1997; Schumpeter, 1911; Schumpeter, 1939). However, innovation never enters our world undisturbed and entirely peacefully; it demands, most often, multiple structural sections and breaches. In reality, innovation is created through constant dialectical cross-fertilization between creativity, potential of adjustment and the composition of strategy, technology and management capabilities (Stra.Tech.Man) of human resources, groups and organizations, within the systematic framework in which they operate. (Figure 5).
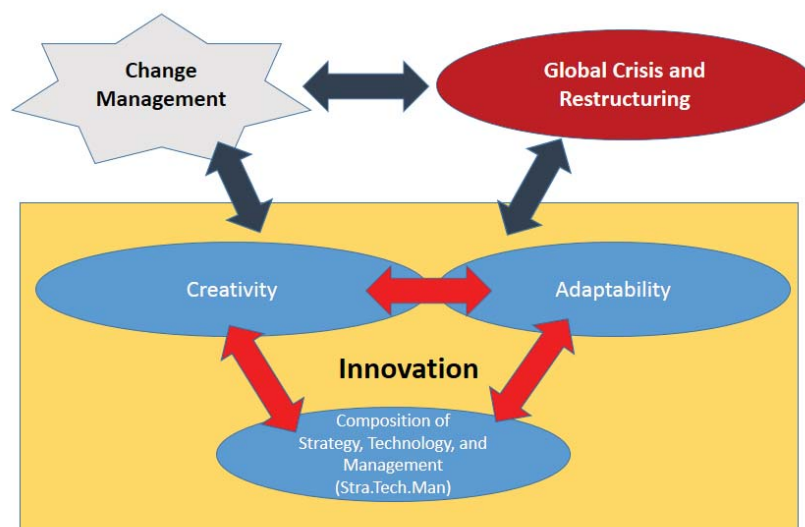
Figure 5. Innovation dynamics

In this sense, becomes clear that our world will not easily overcome in a lasting and stable way the current crisis of globalization, if it does not embrace, absorb and integrate a wide scale of innovations: The sought after restructure of the global economy seems to necessarily go through the way of systematic and effective innovation, in every level of action, private and public, economic and social, productive and consumptive, material and intangible. This, however, sought after victorious progress of innovative potential of our world, will not be achieved automatically.

It requires and it will always require, as a critical precondition, the consolidation of a complete and effective mechanism of change management in every level of structure of our contemporary world (Levin, 2012; Marquis & Tilcsik, 2013; Marshak, 2005; Phillips, 1983; Vora, 2013). It will demand, eventually, a renewed understanding of the central dimensions of change, a gradual consolidation of a dialectical point of view in the effort of understanding the contemporary, ever-evolving reality and a new, coherent change management in terms Stra.Tech.Man, in every level of our thinking and action. (Figure 6)
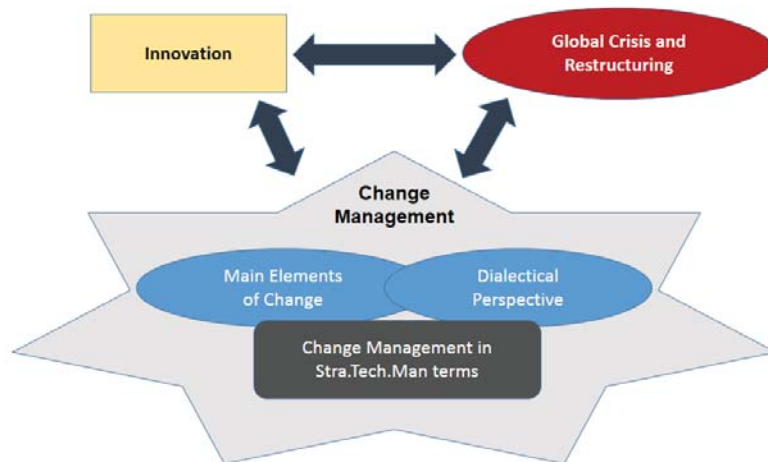
Figure 6. The challenge of change management

3.1 Multiplicity in the Perception of Innovation

A great number of theorists has tried to convey, in the last few decades, the content of the different point of views for innovation. These perspectives summarise a great number of various theoretical concepts deriving from different disciplines and ideological origins. We summarise some of these views in the Table below.

Theorist	Conceptual Approach on Innovation
Peter Drucker	Innovation as a specific process of the business culture, expressed primarily at a personal level: Innovation is the specific function of entrepreneurship, whether in an existing business, a public service institution, or a new venture started by a lone individual in the family kitchen. It is the means by which the entrepreneur either creates new wealth-producing resources or endows existing resources with enhanced potential for creating wealth (Drucker, 2002).
Porter	Innovation as the crucial factor of defining and altering the industrial structures, as the ultimate strategic priority and as a one-way street for the acquisition of a competitive advantage. More specifically, Porter presents innovation as the result of unusual effort. The firm that successfully implements new or improved ways of competing is the one that doggedly pursues its approach, often in the face of obstacles. The strategy is the personal crusade of an individual or group. As a consequence, innovation often results from pressure, necessity, or even adversity. The fear of loss often proves more powerful than the hope of gain (Porter, 1990).
Nonaka and Kenney	Inherently, innovation is the process by which new information emerges and is concretized in a product that meets human needs. The healthy firm is a negative-entropy system which constantly creates new order and structure in its struggle to survive and grow. (…) To remain competitive any firm must constantly be creating new strategies, new products, and new ways of manufacturing, distributing and selling (Nonaka & Kenney, 1991).
Rogers	An innovation is an idea, practice, or object that is perceived as new by an individual or other unit of adoption. It matters little, so far as human behavior is concerned, whether or not an idea is "objectively" new as measured by the lapse of time since its first use or discovery. The perceived newness of the idea for the individual determines his or her reaction to it. If the idea seems new to the individual, it is an innovation (Rogers, 1982).
Rosenfeld	Innovation involves more than turning out high-tech gadgets, and innovators are complex human beings of different backgrounds and all types. Unfortunately, innovation has hit a wall in the workplace because the human component has frequently been neglected. Organizations focus too much on the mechanics of innovation and not enough on the underlying people-based principles. To promote innovation, leaders must first understand what drives it: people (Rosenfeld, 2008).
Gets and Robinson	A business is creative when its workers produce something new and probably useful without having been taught or guided by anyone else. For them, the material evidence of creativity are the upgrades-changes to what has already been accomplished while the innovations represent something entirely new for the business. Many good companies have fallen prey to 'Innovate or Die' mantra, skipped over the foundations of progress—customer-focused processes and managing their employees' spontaneous ideas—and jumped straight into building the penthouse—the layer of innovation capability. They have paid the price of not taking care of the foundation first. It is always fun in the penthouse, but the fun will not last long if it is built on moving sand (Getz & Robinson, 2003).
Narayanan (2001)	"Innovation refers both to the output and the process of arriving at a technologically feasible solution to a problem triggered by a technological opportunity or customer need" (Narayanan, 2001).

This very short summary of definitions on innovation is enough to realize the multiplicity of the term. Despite the same notion of innovation can be perceived in many ways, it is clear that innovation can derive only from

creativity and business development that, in turn, is the end result of strategy and organizational sustainability. However, the organic character of innovation is omitted by the traditional economic and administrative approaches and, as a result, the systemic and strategic response of organizations to external crises and environmental changes lacks analytical and practical efficiency. Businesses ought to constantly adjust themselves within complex, almost chaotic, conditions and innovation by itself is the response—and also the catalyst—to all the crises.

3.2 Contemporary Approaches of Innovation and Change Management within the Crisis

The social changes, chaotic and unpredictable as they may be, always involve a systematic personality. Without the understanding of this systematic personality, nothing can interpret the structural continuance and change to the human and organizational behaviors (Burns, 2007).

Although, of course, the gradually deeper specialization of the economic science in matters of organization, few approaches are able to shed a light in the correlation between the three forces: the crisis, the innovation and the change management. In the direction of a "neo-schumpeterian" approach (Kleinknecht, 1987), we could claim that the crisis is not so much a result of a "dry" and intangible financialization (Beck, Chen, Lin & Song, 2016), but it is about a phenomenon born from the business evolution and innovative potential. It is a dialectical readjustment of the old order of things that guides the system (the global economy in this instance) towards a new, different from the past, evolution.

In the majority of contemporary scientific articles, however, the approach of the global crisis is simplistically identified through the consequences of the financial globalization (Hausman & Johnston 2014; Sánchez, 2010; Sveiby, 2012), sometimes carrying a positive sign, and most times, a negative one. Certainly any narrow financial mechanisms for facing the crisis are not sufficient to provide effective solutions, because a stimulation of active demand, within the ethnocentric framework, is unfeasible due to the current accomplished interspatial complexity of the global economy. On the other hand, the exclusive focus on the relational and human resources (Melé, Argandoña & Sanchez-Runde, 2011; Sultanova & Chechina, 2016) shifts away from the ultimate target of a complete developmental agenda in economic policy, as it leaves out crucial characteristics of the system that led to the need of an advanced human capital.

Entering, therefore, into the deeper characteristics that consist the economic activity, it is important to report an indicatory relationship between the global crisis and the innovative results of businesses and their consequent developmental courses. A recent research (Paunov, 2012) proves that for the years 2008-2009 in eight countries of South America, crisis led a number of companies to pause their innovative projects. Businesses that had access to public funding were less likely to give up, while newer companies and businesses-suppliers towards multinational foreign counterparts there were those that presented halting of their activities at a more usual rate.

This fact indicates not only the lack of targeting in economic policy by the majority of the emerging and medium level of development nations towards the methods of enhancement of local development (Vlados, Deniozos, & Chatzinikolaou, 2018), but also the struggle in establishing mechanisms of change management within the businesses themselves. To achieve all the above, it is important to penetrate those forces that determine the operation of the business and, as a result, the total dynamics that is diffused within the global economic system: The structural triptych of strategy technology and management.

3.3 The Innovative Environment and the Dynamics of Strategy, Technology and Management (Stra.Tech.Man)

In this paper we propose a conceptual model that bring together the conditions of macro-economic and systemic crisis with the internal, organisational and strategic responses. We have argued so far that crises constitute moments of cosmological collapses (Weick, 1999) but they also constitute moments of deep thinking about the business models and should be linked with intensive innovation.

The main point of this present work, consists of the finding that although many innovations seem to be pushed authoritatively towards the organizational cell of the procedure, by one of the three forces Stra.Tech.Man—either by strategy, or technology, or management—there can never be any innovation completed in the inside of any organization without going through and transform synthetically all of its three main structural spheres (Vlados & Katimertzopoulos, 2017). (Figure 7)
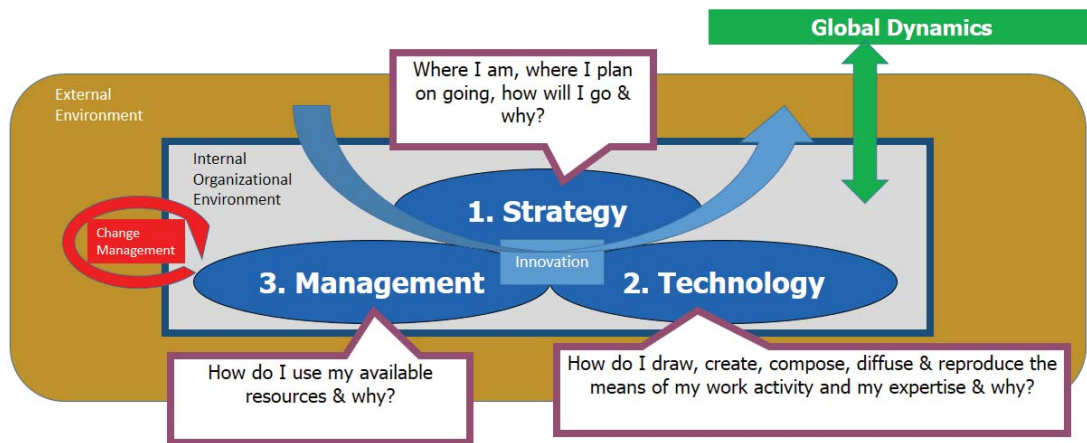
Figure 7. The evolving core of business, innovation, change management, and global dynamics

All these three dimensions of the organizational Stra.Tech.Man always converge and evolve. All the dimensions together get reorganized and coordinated necessarily in the dynamics of the global environment and are evolutionary reinserted in the innovative game. This is necessary and unescapable. And all these together lead to the constant evolving of the organization itself in terms Stra.Tech.Man and of its structural external environment as well. (Figure 8)
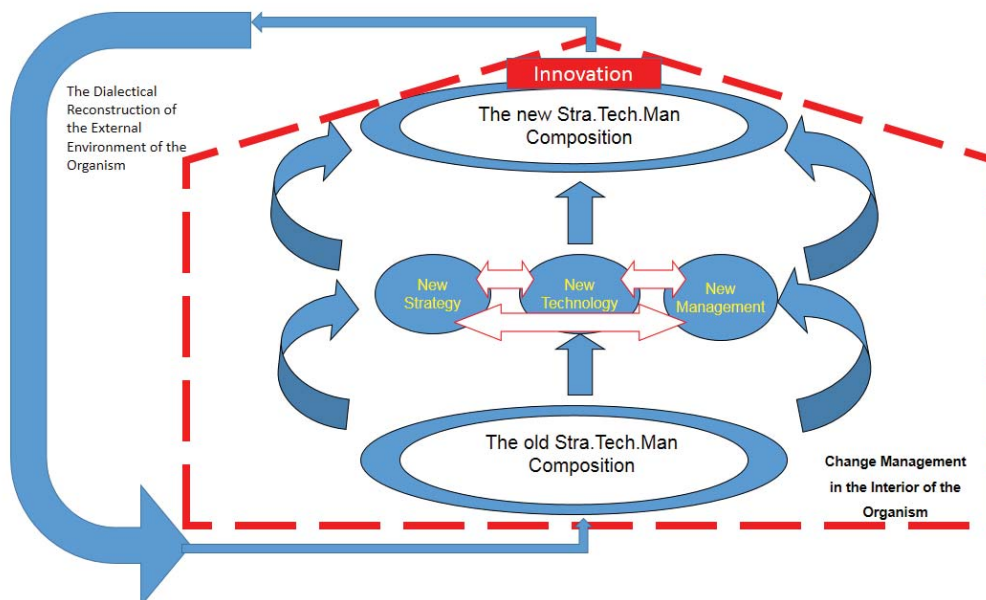
Figure 8. The reproduction of the innovative dynamic of the business in terms Stra.Tech.Man and the constant restructure of its external environment

Within a world that tends to be more "open" and interactive, the borders of organizations, of any type and level, they become more and more porous and vague. In this contemporary reality the notion of "innovative environment" (milieu innovateur) (Aydalot, 1986), in every level of space—national, international, regional and local—seems to be getting progressively critical importance. In practice, we can perceive the innovative environment as a spatially established socioeconomic composition of multiple knowledge, decision and action, which is dialectically opened externally, towards its environment. "Gives and takes", incorporates and diffuses ideas, expertise, practice, values, and methods of operation, rules and "relational capital". It is about, in practice, an environment "tied", always, with a community of carriers/perpetrators and their available resources, human, cognitive, informative and material. It is not a "closed box" but, instead, it is a complicated system in a constant interaction and intellectual evolution with its wider external environment.

Essentially, every organization in its core is a receiver and, at the same time, a transmitter of elements, data and actions within its operational ecosystem in which it is based and evolved. And in that way, the composition

Stra.Tech.Man which is achieved by any organization depends directly upon its structure and the dynamics of the ecosystem in which it is based and evolved and which, in turn, participates and contributes, more or less in the utterance of the global dynamics. (Figure 9)
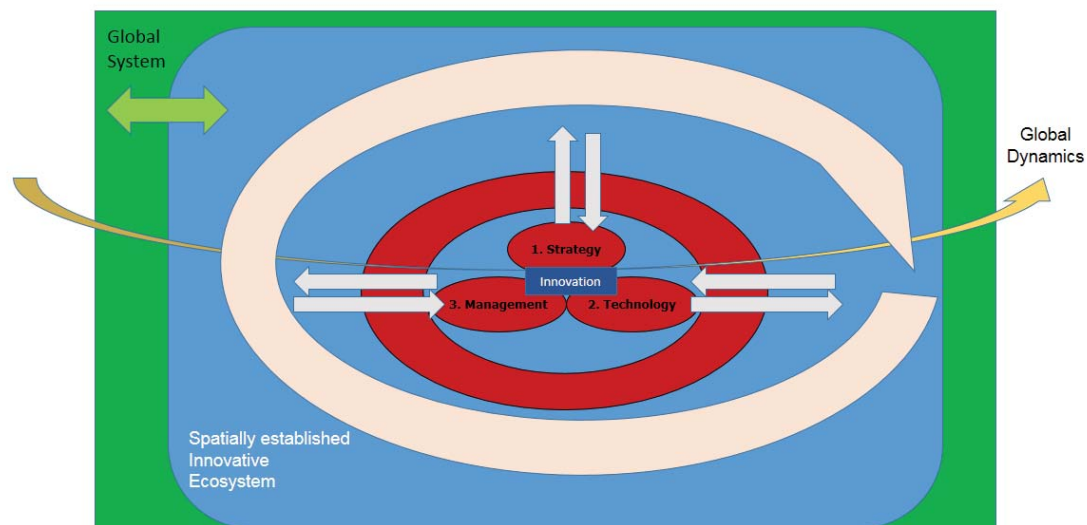
Figure 9. Spatially established innovative environment, composition Stra.Tech.Man and global dynamics

In practice, every organization draws data with which it develops the strategic, technological and managemental "arsenal" and, at the same time, channels towards its environment strategic, technological and managerial components and resources. It "inhales" strategic, technological and managemental resources, it synthesizes it, internally, in its way, trying then to "exhale" it as innovation. And, of course, cohabits and develops articulating—and restructuring without interference—its necessary structural relations that overtake its plain market transactions. And through this notion every organization is a birth of the innovative wealth—or poverty—of the same "space" that hatches and hosts it while, at the same time, contributes ceaselessly with its presence and action in the structure of the innovative wealth or the poverty of that space (the "space" can be perceived in every level of space: national, international, regional or local).

The innovative resources Stra.Tech.Man of every organization "do not just fall of the sky". The fauna (organizations) of the "ecosystem" directly depend upon the flora that surrounds it and "breeds" it (institutions, regularities, total socioeconomic framework). Likewise, of course, the "flora" of every innovative ecosystem is influenced directly by the way the various "living organisms" act within its evolving interior.

3.4 The Renewal of the Mechanisms of Change Management, in Every Level of Action

The problems in change management do not constitute an establishment, something settled and reassured scientific field so there can be clear and predefined theoretical limits and clear methodological preconditions in its approach. There is no "general theory" on the subject and there is no agreement over a paramount example. On the other hand, not only the theory but also the practice of the change management seems to result, in our time, from the convergence and interference of a big number of branches of the social studies and various notional interdisciplinary traditions. Even if that is where the power and the charm may lie, the investigation of its theoretical foundation and potential does not ceases to make up for a difficult case (Burnes, 2009: 258-261).

Change, according to the point of view we suggest, is a procedure that materializes ceaselessly for the entire life and operation of the organization, whether it desires so or not. With the simplest definition possible, change is the procedure of modification of the way in which an individual, a team or an organization acts as a group by going through a set of ways of action and behavior to another one, transforming its performance and effectiveness.

The forces that influence the change are always, simultaneously, both external and internal in a business. The external forces are about its direct micro-environment (market, competition, suppliers, franchises and supplementary products, distribution networks etc.) as well as its macro-environment (legislation, society, technology, environment, economy etc.). The internal forces come from the internal strategic mechanisms, its technological structure and from the special nature of authority and administration at its interior and human resources.

In the international bibliography of the subject, what prevails is the distinction of change in the base of three distinct models:

- The incremental model of change (Burnes, 2009: 254), in which change becomes perceived as a procedure through which the unique pieces of an organization arrange incrementally and uniquely a problem, facing one target at a time. With managers meeting the needs of the changing internal and external environments. One step at a time, through the progress of time, organizations transform and evolve (Miller, 1984).

- The model of interrupted balance of the organizational transformation (punctuated equilibrium) (Burnes, 2009: 255) which perceives organizations to be evolving through relatively big periods of time of stability (stability periods) in the main models of their activity and which get interrupted by relatively small "outbreaks" of fundamental change (revolutionary periods). Those revolutionary time periods, the "times of explosion", essentially, disrupt the installed motives of activity and re-establish the foundations for the new periods of balance (Tussman & Romanelli, 1994).

- The model of constant transforming of change (continuous) (Burnes, 2009: 255-258) claims that in order to survive, organizations must develop their ability to constantly change themselves, at a stable and continuous rate, every moment and ceaselessly (Brown & Eisenhardt, 1997).

Under these conditions, therefore, is born inevitably the reaction to change. It is about that force which appears in individuals, groups or even entire organizations and which tends to refuse, obstruct, limit or even completely cancel the magnitude of the necessary changes. In practice, conflicts always brings about a special content in terms of personal, team, sectional and total organizational and intra-organizational dimensions.

3.5 The Five Steps of the Stra.Tech.Man Viewpoint in Change Management

The contemporary change manager, in every type of organization, according to the viewpoint we present, owes to clarify the main "physiological" targets of change, before any action, in terms Stra.Tech.Man. In detail, every organization owes to conceive and understand the unique "physiological" advantages and disadvantages, based in the composed Stra.Tech.Man viewpoint and which opens up at the same time, space for special opportunities and threats that they face in the contemporary, uniquely demanding and labyrinthian, global economy. The more critical problems that the organization faces and those that put a barrier in the effective change management are finally at its physiological core. That is, they are born and reproduced through the total evolving dimensions.

- In its complete strategy
- Its complete technology
- Its complete management

This is the reason why, in our perception of change management, we firmly move away from the analytic theory which perceives social organizations of every kind linearly and as static mechanisms, and we move, unreservedly, towards an understanding that perceives them in a dialectical way (Cassin, 2004; Corbett & Connors, 1998; Fox, 2005; Kaufman, 1966; Lenin, 1976; Popper, 2015; Sartre, 1984), like living and evolving organisms. As a result, we remain convinced that every effort of managing change, inside any organization, must primarily take under consideration its "living" nature, inside its ever evolving "living", external environment.

In this way and on these conceptual foundation, we can formulate five phases (Figure 10) of change management under the Stra.Tech.Man viewpoint we propose, as an endeavor of composing the approaches concerning management change. Specifically, we suggest those five steps of change management under the Stra.Tech.Man viewpoint as a constant cycle of five perpetually repeated steps, which are destined to ensure: (i) the successful strategic transformation, (ii) the successful technological transformation, (iii) the successful managerial transformation, (iv) the successful innovative composition and (v) the successful assimilation of change and the constant, adaptive variation of organization.
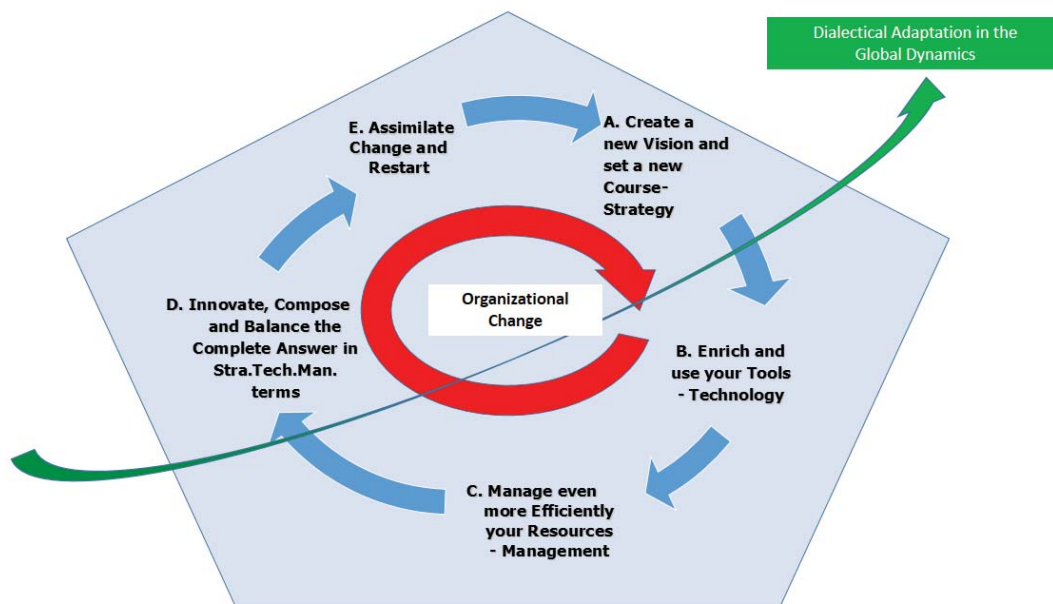
Figure 10. The five steps of change management through the Stra.Tech.Man approach and the dialectical adjustment of organizations in the global dynamic

All these previous steps, in each individual link, we assess they have to be materialized, always, through an open, evolving, dialectical spirit. Otherwise, they cannot fulfill the potential of change management that every organization holds.

4. Conclusive Comments and Limitations: Towards a New Economic-Political Synthesis for the Overcoming of the Crisis at a Global Level. The Direction of a Realistic Innovative Liberalism

The idiosyncratic track of the current crisis of globalization seems to be imprinted by now, directly, in the deepest level of the socioeconomic evolution of every region and every agent of action on the planet. It penetrates and dissects the real life of every individual, group and entire organization, their plans and actions of every kind.

The successful innovation on behalf of the various social organizations, as well as the structure and operation of their management change mechanisms cannot be fulfilled under "institutional gap". Entirely differently, the total institutional substratum, in every level of structure and operation constitutes, simultaneously, both the engine and the institutional receiver of the global dynamics of the sought-after restructure.

In conclusion, the global restructuring process will end up in benefiting the socioeconomic development only when a new global structural triptych will get effectively combined and established: toward a new model of ideological and political understanding of the contemporary global developments. (Figure 11)
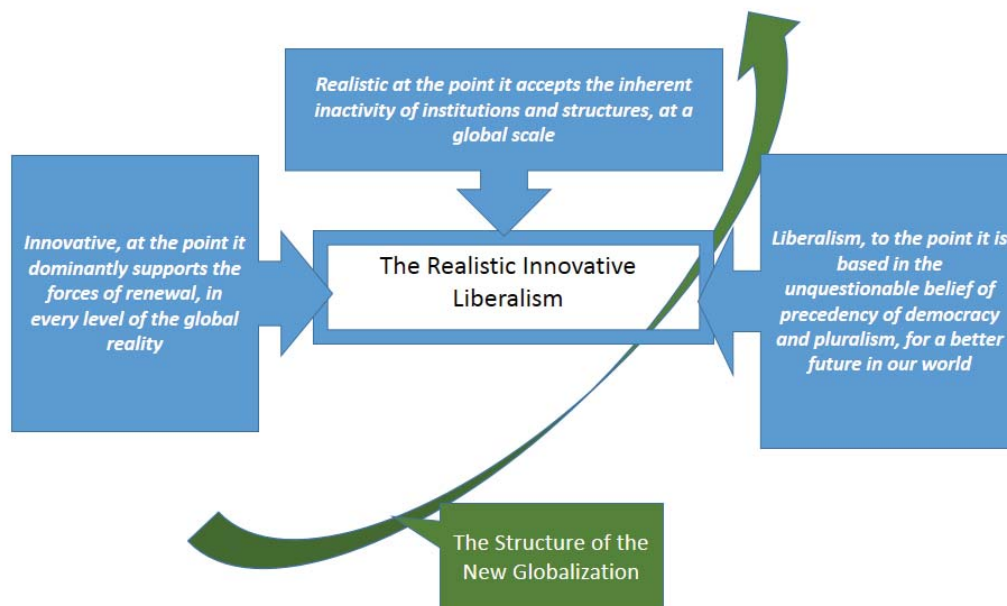
Figure 11. Realistic innovative liberalism and the structure of the new globalization

Thus, for building an effective structural triptych of a "realistic innovative liberalism" first of all a renewed way of viewing global dynamics is needed. A view that achieves to give the appropriate emphasis to all three components and fertilize them in practice.

- Realistic, at the level it accepts the inherent inactivity of institutions and structures, in global level.

- Innovative, at the level it supports dominantly the forces of renewal, in every operating level of the global reality.

- Liberalism, in the level it is based in the undisputed belief of the precedency of freedom, democracy and pluralism, for a better future in our world.

Over the course of a world which constantly reminds us of its increasing uncertainty, the combination of an ideological-political thought characterized by a structural link between realism, innovation and the creation of favorable conditions for liberal action can be the decisive criterion for integrating all those actors that are called upon to shape a sustainable new model of development; that is the new globalization. The limitations of that perspective are, of course, of theoretical and practical reach. Ideological and methodological repositions and policy restructurings will be definitely required for such kind of perspective to flourish; and over multiple levels of understanding and, of course, on a global scale.

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[1] Think of this diagram as the phenomenon of electricity. As it is known, the electric current is the oriented movement of electric loads or electricity carriers along a duct. The electrical current is generated by the potential difference between two points (from high potential points to low potential points). If there was no such difference, there would be no flow of electricity; this is also the case with globalization.

A Study on Progress of Students in Nizwa College of Technology with Special Emphasis on Stress Related Issues

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Abstract

In today's competitive world, challenges faced by students from different sources contribute to stress and effects the consistency in their performance. So the researcher felt a need to study the reasons behind their underperformance. An exploratory study, conducted to know the latent intentions of the respondents towards learning process in Nizwa College of Technology, across three departments— Engineering, Business studies and Information Technology. Out of total population of students studying in three departments of Nizwa College of Technology, a sample of 102 students were taken for research which comprised a mix of Male and Female Students. The sampling method adopted for the study is convenient sampling method, wherein the students were contacted on a random basis by administering a structured online questionnaire using google forms. Data is collected from primary and secondary sources. The supportive literature review and the conceptual framework were taken from secondary sources. Data was analyzed with the help of T-test and Factor analysis. It is found that most of the students get worried and tired when they are in stress. To reduce the stress levels almost 33% of students believe that talking to their friends and taking rest reduces stress. It revealed that various factors that contribute to stress are economic, personal, college resources, learning methods, outcomes, teaching methods, recreational activities and infrastructural facilities. Hence, it is concluded that apart from academic issues there are many other things which are contributing towards stress among students. Many students are either worried or tired because of the pressure they face in their day to day activities. Stress related issues cannot be ignored in an academic environment, as this may lead to a negative impact on a student's life.

Keywords: challenges, intentions, learning process, performance, stress, teaching methods

1. Introduction

College life is one of the most memorable experience in a youngster's life. It is in college that the youth enjoys a lively environment, the company of friends and the various academic and co-curricular activities, which enriches, nurtures and prepares them for adulthood. College students are at a critical period where, they enter adulthood. They are expected to be the leaders in the society. Thus, they should enhance their stress management abilities so as to live a healthy life after entering the society as adults. Adolescence is a stage of human development that occurs between childhood and adulthood. Due to physical changes and mental development at this stage, students may experience incompatibility of their mental development with their physical changes or with the social environment and they suffer from problems arising from inadequate variations. These problems may further cause psychological troubles and even induce divergent behaviours. Adolescence is a perilous period of time where young people experience self-organization and role confusion. For them, stress mainly comes from academic tests, interpersonal relations, relationship problems, life changes and career consideration. Such stress may usually cause psychological, physical and behavioural problems. This study examines the various aspects that contributes to stress among college students.

2. Background of the Study

Today's students are more stressed than the past. In fact, in 2015 American College Health Association National College Health Assessment found that 85.6 percent of students had felt overwhelmed in the past year. The pressures of getting top grades, balancing extracurricular activities with studying, and spending time with family all add up. In addition, students manage another identity in the digital world. Social media platforms are one more thing to keep up with and are often common with stress-inducing comparisons, gossip and bullying. Significant life changes—such as a death in a family, moving to an unfamiliar location or a divorce—are likely

to cause high spikes in stress. 2016 study published in the International Journal of Clinical and Health Psychology shows daily stressors play just as significant a role in affecting overall mental health. When a student is stressed and preoccupied, it takes over their ability to focus during lectures or studying. Stress may even cause students to drop out of college or drop classes. As research shows, stress exhibited by instructors directly increases the stress levels of students while in the classroom. Stressors may pop up any moment to disrupt learning and concentration. Nizwa College of technology comprising of various Departments like Engineering, Information Technology and Business is imparting a systematic education to the students for their personal and professional development which is helpful for their future. Due to the competition and challenges faced by students from different sources made those not equally competent to accept the education offered in Nizwa college of Technology. It is noticed that there is a variation in the students' performance from time to time. So the researcher felt a need to study the reasons behind their underperformance and provide valuable suggestions to improve the system of teaching learning process in NCT.

2.1 What is Stress?

Stress is the reaction of one's body and mind that causes a change in the balance. Stress is a common aspect of many different emotions like anxiety, frustration, anger, worry, fear, sadness and despair. A very clear physical aspect is involved in it. Some may experience such as a pain in the chest or in the bottom of the stomach or in the form of compressing their jaws. (MyersDG, 2005)

2.2 Definition of Stress

A state of mental or emotional strain or tension resulting from adverse or demanding circumstances. (Oxford dictionary). Stress is your body's way of responding to any kind of demand or threat. When you sense danger—whether it's real or imagined—the body's defenses kick into high gear in a rapid, automatic process known as the "fight-or-flight" reaction or the "stress response". The stress response is the body's way of shielding you. When working properly, it helps you stay attentive, energetic, and alert. In emergency situations, stress can save your life—giving you extra strength to defend yourself, for example spurring you to bang on the brakes to avoid an accident.

2.3 Different Forms of Stress

Stress can be of two forms: positive stress (Eustress) and negative stress (Distress). Eustress is the feeling of relief. Distress is an emotion that leads towards disease. This type of distress is generally caused by an event in one's life, for example, failure in exams, divorce, notification of debt, tax, and etc. Eustress is a positive stress set off by a positive event in one's life. Its examples may include winning a championship, planning or attending a wedding, wining a lottery, or receiving an unexpectedly good result in an exam. Eustress allows people to engage in the challenges of life.

2.4 Causes of Stress

Causes of stress are known as stressors. Being physical or emotional, internally or externally generated, the stressors are classified as:

1. Exogenous or external factors: they are those factors which originate from exterior and individual has no control over that. For example, the death of loved ones, etc.

2. Endogenous or internal factors include strong memories of previous unpleasant experiences, which make individuals highly sensitive to such instances. They anticipate the same unpleasant events, and their fear gives rise to feelings of inferiority, insufficiency and insecurity.

3. The combination of endogenous and exogenous factors also leads to the creation of stress. (Holahan & Moos, 2000)

4. System induced stress is another type of stress identified by psychologists; System refers to organizations like school, family, office and other such social structures, in which an individual functions. Life becomes tough if any of these structures are stress inducing. (Holahan, Charles, 1982)

This type of stress is highly relevant to under-developing societies in the context of changing demands in the family and workplace. One group of society which is a victim of system induced stress is the student community. The natural instincts of children to be playful and fun loving come in severe conflict with the pressure imposed by the academic overload and expectations. The academic burden in school and unrealistic parental demand and social expectations are imposing severe stress on students especially among young students Most of the high school students in Iran concentrate only on academics and do not give much importance to other activities. Even the parents are convinced that these are the crucial years where the children need to concentrate only on

academics in order to perform well in the race of entrance examinations at the end of senior intermediate. Thus, the students are left with no choice except participating in this race, especially those students who opt for science and mathematics branches at high school levels. Other branches such as art, commerce and literature are considered to be low grade by the staff, students, parents as well as the managements of educational establishments. (Ko,SM,Kua Eh,1999)

3. Review of Literature

Stress is the process by which an individual or a person react when opened to external or internal problems and challenges. "The organism processes numerous systems to coordinate such adaptive responses both at systematic and cellular levels "by this, stress has direct effect on the brain and the whole anatomy of the body as such failure to adapt to a stressful condition can result in brain malfunction, physiological problem and also many areas of psychological challenge's in the form of depression, nervousness, discomfort and burnout.

According to Wheeler (2007), stress is physics word which refers to the amount of force used on an object and it relates in real life as to how certain issues that carry force applied to human life. Examples financial difficulties, health issues, conflicts with friends, all carry force or pressure on person's body -mind and spirit. Some of the pressure or power originate from the environment but most often comes from within a person's head in the form of worry, anxiousness, repentance, discouragement and low confidence. Therefore, stress is basically force applied to a person and may result in a strain which is a result of an unmanaged stress i.e. when a person is not able to handle a task or problem encounters strain. To some people, the effect is minimal which means they are able to tolerate pressure whiles in others the effect is huge and have an adverse effect. Junru Yang & Lei Zhang. (2005) College students are at a special stage in life. Their mental development is in the process of maturity but still immature. Their interpersonal communications are complex, which produces mental stresses. In life, they mostly depend on family, plus most of them are the single child in one family, their self-care abilities are poor, which may produce mental stresses either. In addition, the college students who experienced unhappy family matters have more worries, depressions, and physical diseases than people who did not. Meanwhile, stresses from family conditions may be from parents' expectations for children. Al-Busaidi, Z et al. (2011). A study was conducted to find out the incident of depressive symptoms among the university students in Oman. According to this study there were various factors which contributed towards depression. Factors such as moving away from your family home for the first time, losing the adult supervision and the traditional social support. Some students' might also have to deal with financial difficulties for first time in their lives. These changes were recognized as risk factors for evolving depression. Nakalema ,G., Ssenyonga, J,.(2013) This study examined academic stress, study habits and academic performance of undergraduates of Mbarara University of Science and Technology in Uganda using a cross-sectional survey research design. Findings showed that daily academic disturbances were found to be the most stressful while personal problems were reported as the least stressful. First year students experienced more academic stress from financial hardships academic burden/time and social expectations than the ongoing students. Motivation was the most used study among the respondent, while studying a chapter was the least common study habit among the students. Faculty of Development Studies students had better study practices than other faculties/institute based on grade performance. Elzubeir M A, (2010) Stress, unhappiness and nervousness are common among Arab medical students as compared to students elsewhere. Little is known about the contribution of different curricula methods to perceived stress and what coping strategies institutes and students apply to help alleviate stress. Large, prospective, multicentre, multi-method studies are needed to identify personal and program features that influence stress, depression, anxiety and coping strategies among Arab students. Carver CS (1997) Managing strategies refer to the specific efforts, both behavioural and psychological, that people employ to master, reduce tolerate or lessen stressful events. 'Active coping' means taking action or exercising efforts to remove or avoid the stressor, 'positive reframing' means making the best of the situation by growing from it or seeing it in a more positive light, 'denial' is an attempt to reject the reality of the stressful event while 'behavioral disengagement' means giving up or retreating efforts from the attempt to attain the goal with which the stressor is interfering. Elizabeth, (2003) a healthy lifestyle is an essential mate to any stress-reduction program. Stress occurs when pressure exceeds beyond its perceived ability to handle. Stress is the body's reaction to a change that requires a physical, mental or emotional modification or response. Today, stress levels among children have been going up hazardously high due to the pressure of their academic and large amount of syllabus content in a limited span of time and too much expectation from parents. High level of stress is likely to eventually affect the health of the students. Strong et al., (2008) Being able to manage responsibilities, problems, or difficulties in a quiet and thoughtful manner is one way of handling. Students are being pressured frequently by a variety of factors which cause them to have stress in one or more ways.

3.1 Theoretical framework
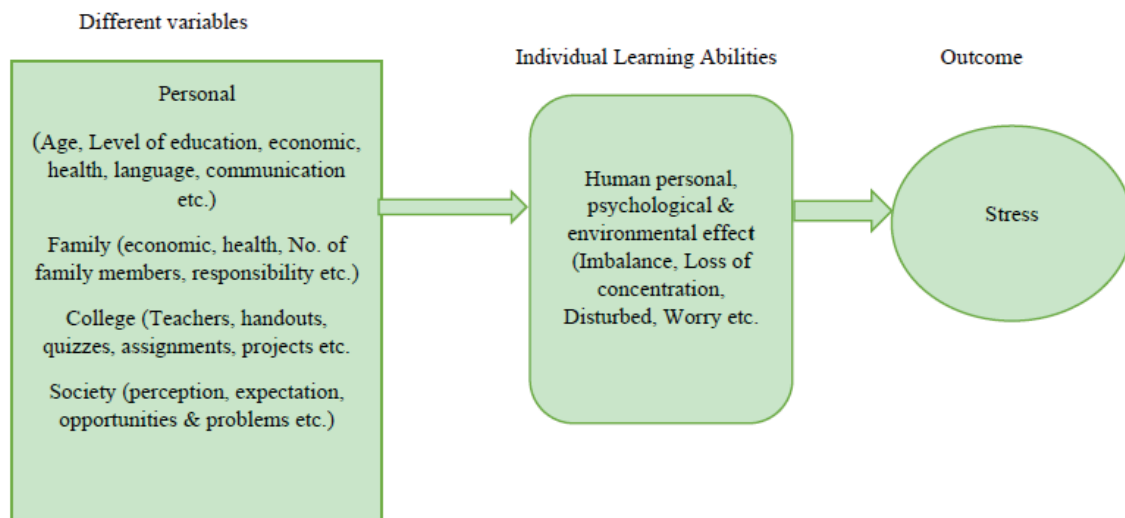
4. Research Approach

4.1 Objectives of the Study

1. To study the prevailing education system in Nizwa College of Technology.
2. To understand the problems faced by students in the teaching learning process in NCT.
3. To identify the reasons for under performance of students in NCT.
4. To suggest measures to improve the performance of students in NCT.

4.2 Scope of the Study

The scope of the study is confined to Nizwa College of technology covering various departments like Engineering, Information technology and Business and it is restricted to the students problems faced during learning process and the respondents are limited to the students of NCT. The research has been conducted between January-March 2018.

4.3 Methodology

It is an exploratory study, conducted to know the latent intentions of the respondents towards learning process in NCT. The area selected for this study is Nizwa College of technology across three departments— Engineering, Business studies and IT. Out of a total population (3462) of students studying in three departments of NCT, a sample of 102 students were taken for our research which comprised a mix of Male and Female Students. The sampling method adopted for the study is convenient sampling method, wherein the students were contacted on a random basis by administering a structured online questionnaire by using google forms. Data is collected from primary and secondary sources. The supportive literature review and the conceptual framework are taken from secondary sources. Primary data is collected with the help of a structured online questionnaire. The instrument consists of closed ended questions which helps the respondents to give proper responses. A list of 24 questions are included that addresses the objectives of the study. Data is analyzed with the help of T-test and Factor analysis.

4.4 Significance of Study

This study is essential to find out the various components contributing to stress among students and thereby decreasing their performance. It is required by the college to analyze the causes of declining grades of students in their academics. The outcome of the study is important for Ministry, college, teachers, students, parents, society and industry.

5. Analysis

The results in succeeding tables demonstrated significant differences on causes of stress when they were grouped according to their gender. The T-Test of independent means was used for two groups' variables

Table 1. Gender- Causes of stress

Sl.No	Causes of Stress	Gender	N	Mean	T	Sig. (2-tailed)
1	Not having enough money to run monthly expenses.	Male	43	2.23	-2.061	0.042
		Female	59	2.64	-2.06	0.042
2	Workload given by the teachers (Assignments, HW, Quizzes etc.)	Male	43	2.77	-1.064	0.29
		Female	59	2.95	-1.058	0.293
3	Competition among friends and class mates in the college.	Male	43	2.28	-0.983	0.328
		Female	59	2.44	-0.963	0.338
4	Family commitments hinders towards achieving academic success.	Male	43	2.42	-1.576	0.118
		Female	59	2.68	-1.545	0.126
5	Health conditions will interrupt the academic performance.	Male	43	2.12	-3.083	0.003
		Female	59	2.66	-2.964	0.004
6	Spending more time playing sports and games.	Male	43	2.6	0.899	0.371
		Female	59	2.42	0.893	0.374
7	Examination results declared.	Male	43	2.74	-0.468	0.641
		Female	59	2.83	-0.46	0.647
8	Not enough time to manage personal, family and academic work.	Male	43	2.72	-1.455	0.149
		Female	59	2.97	-1.436	0.155
9	Not being happy with the existing infrastructural facilities (Handouts, transport, library etc.)	Male	43	2.81	1.257	0.212
		Female	59	2.59	1.196	0.236
10	Overall your level of stress at present	Male	43	2.6	-1.04	0.301
		Female	59	2.78	-1.009	0.316

The analysis of findings in the above table no: 1 using T-Test of independent means illustrated that 'significant differences' existed when the respondents are grouped by 'gender' regarding the causes of stress. This was reflected as results. Not having enough money to run monthly expenses (0.042) and Health conditions will interrupt the academic performance (0.03) had computed values (t) with significant levels (sig.), which are lesser than p value at 0.05.

5.1 Perceptions of Respondents towards Teaching Learning in NCT

Factor analysis is performed for the data obtained from the questions asked to the respondents related to the teaching learning in NCT. Principle component analysis method and varimax rotation with Kaiser Normalization is done.

Table 2. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.721
Bartlett's Test of Sphericity	Approx. Chi-Square	731.725
	df	276
	Sig.	.000

From the above table no: 2 it is evident that Kaiser –Meyer-olkin and Bartletts test sampling adequacy is 0.721(> 0.5) which is acceptable for the present study.

The component matrix found that there are 7 factors extracted from original 24 variables. Table 3 examines the total variance explained by the factor analysis and gives an indication about the number of useful factors. The table 3 has three parts. First part titled initial eigen values gives the variance explained by all the possible factors. Second part extraction sums of squared loading gives the information for factors with eigen values greater than one The last part titled, rotated sum of squares gives the information for extracted factors after rotation. The result indicates seven factors with eigen values greater than one suggesting a seven-factor solution. The factor 1 explains 11.52 percent of variance (under varimax rotation) out of total variance of 60.89 percent of 7 factors.

Table 3. Total variance of the respondents' perceptions towards teaching learning in NCT (Total Variance Explained)

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumula tive %	Total	% of Variance	Cumulati ve %	Total	% of Variance	Cumula tive %
1	5.588	23.283	23.283	5.588	23.283	23.283	2.767	11.529	11.529
2	2.112	8.8	32.082	2.112	8.8	32.082	2.696	11.232	22.762
3	1.556	6.485	38.567	1.556	6.485	38.567	2.383	9.93	32.692
4	1.492	6.218	44.785	1.492	6.218	44.785	1.985	8.272	40.964
5	1.385	5.769	50.555	1.385	5.769	50.555	1.8	7.499	48.463
6	1.254	5.225	55.78	1.254	5.225	55.78	1.531	6.378	54.84
7	1.227	5.113	60.892	1.227	5.113	60.892	1.452	6.052	60.892
8	0.987	4.112	65.005						
9	0.954	3.977	68.982						
10	0.903	3.763	72.744						
11	0.803	3.344	76.088						
12	0.718	2.99	79.078						
13	0.684	2.849	81.927						
14	0.638	2.658	84.585						
15	0.582	2.426	87.011						
16	0.507	2.111	89.121						
17	0.497	2.069	91.191						
18	0.386	1.61	92.8						

Extraction Method: Principal Component Analysis.

Results of factor analysis for the questions related to the respondents perceptions towards teaching learning in NCT.

Each factor is analyzed by identifying those items that had high factor loading and 0.6 is used as cut-off for assigning variable to the factors.

Factor-1 Economic and personal

1. Not having enough money to run monthly expenses.
2. Not having enough time to manage personal, family and academic work.
3. Not being happy with the existing infrastructural facilities (Handouts, transport, library etc.)
4. Overall your level of stress at present

Factor-2 College resources

1. The college library has enough resources to help students.
2. The number of classes in a week are acceptable by the students.

Factor-3 Learning methods and outcome

1. More presentations and Practical activities helps the students to increase their performance.
2. Duration of class time is acceptable by the students.
3. Examination results declared.

Factor-4 Personal

1. Family commitments hinders towards achieving academic success.
2. Health conditions will interrupt the academic performance.

Factor-5 Teaching methods

1. Class activities and discussions help to understand the concepts better.
2. Language used by teachers is understandable by the students.

Factor-6 Recreational activities

1. Spending more time playing sports and games.

Factor-7 Infrastructural facilities

1. The college Wi-Fi assists students towards better performance.
2. The college cafeteria is helping the students to relax in their busy schedule.

5.2 Descriptive statistics of the of the respondents' perceptions towards teaching

The following table 4 shows that the mean, standard deviation of the variables asked to the respondents towards their perceptions towards teaching learning in NCT.

Table 4. Descriptive statistics of the of the respondents' perceptions towards teaching learning in NCT
(N=102)   (SA-1 A-2 DA-3 SDA-4)

Sl.no	Components	Mean	Std. Deviation
1	The college provides appropriate timetables to the students	2.51	.941
2	The college gives enough information about the level of study	2.48	.829
3	The college provides acceptable number of courses per level	2.31	.783
4	The college Wi-Fi assists students towards better performance.	**3.08**	.972
5	The college library has enough resources to help students	2.63	.889
6	The college cafeteria is helping the students to relax in busy schedule.	**2.98**	.912
7	The number of classes in a week are acceptable by the students	2.32	.977
8	The course contents are easily understandable by students.	2.68	.786
9	The handouts are in easy and simple language.	2.47	.875
10	Moodle is helping students to understand the topic better.	2.62	.868
11	Class activities and discussions help to understand the concepts better.	2.21	.788
12	More presentations and Practical activities helps the students to increase their performance.	2.35	.981
13	Language used by teachers is understandable by the students.	2.33	.812
14	Duration of class time is acceptable by the students.	2.62	.845
15	Not having enough money to run monthly expenses.	2.47	1.012
16	Workload given by the teachers (Assignments, HW, Quizzes etc.)	**2.8**7	.852
17	Competition among friends and class mates in the college.	2.37	.820
18	Family commitments hinders towards achieving academic success.	2.57	.827
19	Health conditions will interrupt the academic performance.	2.43	.917
20	Spending more time playing sports and games.	2.50	1.002
21	Examination results declared.	2.79	.916
22	Not enough time to manage personal, family and academic work.	2.86	.845
23	Not being happy with the existing infrastructural facilities (Handouts, transport, library etc.)	2.69	.879
24	Overall your level of stress at present	2.71	.839

From the above Table 4 it is revealed that most of the respondents accepts that, the college Wi-Fi is not assisting students towards better performance (mean = 3.08) with S.D. of 0.972, followed by the college cafeteria is not helping the students to relax in busy schedule (mean = 2.98) with S.D. of 0.912 and the workload given by the teachers (Assignments, HW, Quizzes etc.) are not acceptable with a (Mean = 2.87) with S.D. of 0.852.

6. Findings, Conclusion & Suggestions

It is found that most of the students get worried and tired when they are in stress. To reduce the stress levels almost 33% of students believe that talking to their friends and taking rest reduces stress. However, the students have a disagreement towards the course contents which is not easy for them to understand and technology (Moodle) is also not helping them enough in understanding the topics. The study also indicated that students want to have more class activities, presentations and discussions to improve their performance. Stress management is a very important aspect of a student's life. If students are not able to resolve their stress related issues in initial stages, then it will have a great impact on their performance. This research helped us to find out the various factors of stress like Economic and personal, college resources, leaning methods and outcomes, teaching methods, recreational activities and infrastructural facilities. Hence, it is concluded that apart from academic issues there are many other things which are contributing as a stress factor among students. Many students are either worried or tired because of the pressure they face in their day to day activities. Stress related issues cannot be ignored in an academic environment, as this may lead to have a negative impact on a student's life. Though the college is undertaking enough efforts to provide a better education still they can improve technology usage and should focus more on library resources. The teaching and learning process should be made more student centric. Students' involvement in the class activities and discussions should be encouraged. More focus can be given on improving the language gap among the teachers and students. Teaching them time management will reduce stress. Interactions with parents/advisors can help in this regard. Motivate the students

to involve in practical activities by linking them to their performance, which will enhance their skills and abilities for their personal and professional growth.

7. Scope for Further Research

This research can be further extended to all the colleges of technology for getting better results and it can also consider various other components like personal, family, social, technological etc. Further study can also be extended to identify the dropouts from various technical colleges and explore the reasons for improving the situation in Oman.

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Structural Change behind GDP Growth Rates via Key Indicators: Chile 1996-2015

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Abstract

This paper deals with the change of some aggregate structural indicators in Chile over the *20-year* period 1996-2015. We first produce an accounting growth decomposition to assess the changes in the contribution of capital productivity, capital intensity and labour participation to the growth rate of output *per capita* as well as the growth rate of labour income participation in national income. We then combine an accounting growth decomposition with a standard production function growth accounting to assess the contribution of both capital productivity and capital intensity to total factor productivity (TFP). To complement the latter, we produce optimal estimates of incremental capital productivity and incremental income elasticity to capital by means of a linear programming exercise. Our main conclusion is that capital intensity, rather than capital productivity or labour participation, has been the main growth contributor. TFP has contributed in a decreasing way from positive to negative over our sub-periods, so adding to and subtracting from GDP growth over time, with the main positive contributor to TFP growth systematically being a proportion of capital intensity.

Keywords: structural change, incremental capital productivity, growth decomposition, optimal consistency method (OCM), total factor productivity (TFP)

JEL Classification: O4, B4, E2

1. Introduction

There has been a good deal of macroeconomic studies about Chile's productivity and related issues. These are normally framed in standard production functions, especially the Cobb-Douglas, via growth accounting (Denison 1993, Hulten 1992), under the assumption of constant returns to scale (CRS) and often, implicitly or otherwise, assuming perfect competition with their theoretically convenient marginal conditions. CRS is often imposed in econometrics studies or directly used to calculate the elasticities via some estimation of the actual capital share in GDP from official statistics, which is unwarranted. In turn, the income elasticities of capital and labour are assumed constant over all the target period, which may be unlikely (e.g. Beltran 2017, Fuentes, Larraín & Schmidt-Hebbel, 2006; Dipres; CNP). This means that the results necessarily carry a baggage of assumptions that may not tally with the reality of especially relative latecomers and/or countries with unstable growth, let alone those undergoing significant structural change, as has been the case of Chile. This is especially the case over 1975-1985, which includes a deep downturn over 1982-85, then a recovery at lower rates over 1985-1990, then after some policy adjustments coming from the newly reestablished democracy, high growth rates over 1990-1997, and after it a slowdown due to internal policy changes and world shocks. All this within a relative stable economic consolidation in a very open economy over the period 1996-2015, which was affected by three foreign shocks: the Mexico crisis of 1994, the Asian crisis of 1997 and the Great Recession with effect from 2008 (Ffrench-Davis, 2018, 2014).

The present paper attempts an aggregate viewpoint that is more founded on empirical patterns than theoretical assumptions and may complement alternative approaches. This is a quantitative paper that deals with structural indicators that are mostly based on definitional accounting, rather than functional, relationships. The point is to produce useful decompositions of growth rates by means of discrete first differences. And then observe compositional contributions to the actual growth rates as well as to total factor productivity (*TFP*), among other relevant items. The paper structure is as follows. First, we produce a definitional accounting growth decomposition via first differences to assess the changes in the contributions of capital productivity, capital

intensity and labour participation to the growth rate of output *per capita* over the said period. We also produce a decomposition of the growth rate of labour-income participation in national income via the difference between the growth rates of average wages and average labour productivity. Second, we combine a definitional accounting decomposition with a standard growth accounting decomposition of a production function to assess the contribution of both capital productivity and capital intensity to the total factor productivity growth rate (G_{TFP}). Then we produce aggregate estimates of the optimal productivities of incremental capital over this 20-year period by means of a linear programming exercise to complement the above. This latter approach may reduce the difficulty of assessing idleness, as capital formation is related to optimal output directly (Albala-Bertrand 2010)[1]. From here, a value for the optimal incremental income elasticity of capital can be derived, which can give us an idea about the level and variability of the marginal elasticity of capital used in standard production functions. All our basic data comes from official Chilean sources, unless otherwise indicated[2].

As a general conclusion, we show that the growth contribution of capital productivity has been becoming small and/or negative, and that of labour participation positive but secondary to capital intensity. The latter has taken the bulk of supporting both GDP growth and total factor productivity. This does not necessarily mean that GDP growth has relied on the quantity rather than the quality of resources and production, as behind capital intensity are changes in human capital, organization, adaptations, technical efficiency and the like. So it has not just been physical capital, but the important changes in economic and social structure required to use it and absorb it.

2. General Background

The context for our results can be seen via the 3-year average values of some key variables for both 1996 and 2005.

Table 1. Basic data for beginning and end of the period (3-year moving averages)

Period	GDP	G_Y	G_{FCF}	G_I	Knet	G_K	N	G_N	L	G_L	I/Y	I/K	K/Y	L/Na	Na/N	L/N
	($bn2008)	(%)	($bn2008)	(%)	($bn2008)	(%)	(m)	(%)	(m)	(%)	(%)	(%)	(units)	(%)	(%)	(%)
1996	56211	7.6	10655	13.9	130445	6.1	14.6	1.5	5.3	1.6	19	8.2	2.3	52	70	36
2015	118447	1.8	28349	-1.8	321311	4.1	18.0	1.0	8.1	1.3	24	8.8	2.7	56	80	45
G(1996-2015) (%)	**111**		**166**		**146**		**23**		**53**		**26**	**8**	**17**	**8**	**15**	**24**

GDP : Gross Domestic Product (Y)   *N* : Population G_X: growth rates

GFCF : Gross Fixed Capital Formation (I)   *Na* : Active Population

Knet : Net Capital (K)   *L* : Employed Labour Force

Source: Central Bank of Chile and National Institute of Statistics

Table 1 shows, in 3-year averages, the state of some economic indicators at the beginning and end of our focus period. The growth rates of *GDP*, investment (*GFCF*), net capital stock (*Knet*), population (*N*) and secondarily employment (*L*) significantly fell (or were negative) by 2015. In turn, the investment coefficient (*I/Y*) significantly increased with secondary increases in the capital accumulation rate (*I/K*), and also in the proportion of labour employed-to-active population (*L/Na*) as well as the proportions of both active population-to-total employment (*Na/N*) and employment-to-total population (*L/N*). The capital-output ratio (*K/Y*) increased, indicating that its inverse, the average productivity of capital, fell. So this shows a mixed bag, which can be attributed to a combination of international conditions, endogenous structural change and important policy reforms, especially those starting around 2015 (Ffrench-Davis 2018).

3. Discrete Growth Decomposition Analysis

A definition of output *per capita*, *Y/N,* can be decomposed as:

$$Y/N = (Y/K)(K/L)(L/Na)(Na/N) \tag{1}$$

Where *Y*: output, *N*: population, *K*: net capital stock, and *L*: Labour. That is, output *per capita* is equal to the product of capital productivity (*Y/K*), capital intensity (*K/L*) and labour participation (*L/N*). The latter split into employed labour-to-active population and active population-to-total population. Calculating the first difference of (1), dividing by $(Y/N)_0$ and manipulating to transform all terms into growth rates, we get:

$$G_{Y/N} = G_{Y/K} + G_{K/L} + G_{L/Na} + G_{Na/N} + G_{Y/K}G_{K/L} + G_{Y/K}G_{L/Na} + G_{Y/K}G_{Na/N} + G_{K/L}G_{L/Na} + G_{K/L}G_{Na/N} + G_{L/Na}G_{Na/N} +$$

$$G_{Y/K}G_{K/L}G_{L/Na} + G_{Y/K}G_{K/L}G_{Na/N} + G_{K/L}G_{L/Na}G_{Na/N} + G_{Y/K}G_{K/L}G_{L/Na}\,G_{Na/N} \tag{2}$$

This shows that the discrete growth rate of income per capita is equal to the addition of the growth rates of its four components plus their interactive terms. If we proportionally distribute the interactive terms into the three basic growth rates, as we do in the calculation later, we preserve the accounting identity and get:

$$G_{Y/N} = G'_{Y/K} + G'_{K/L} + G'_{L/Na} + G'_{Na/N} \tag{3}$$

Where G' indicates that the interactive terms have been incorporated to the growth rates, as mentioned above[3]. Notice that the addition of the first two terms on the right hand side of equation (3) is equal to the growth rate of labour productivity $G'_{Y/L}$, which we use below. Similarly, we can have a measure of the evolution of the change rate of the wage share in GDP by means of making $W/L = (W/Y)(Y/L)$, or the wage rate equal to the wage share times labour productivity (where W: total real wages). Applying the same procedure as above, we end up with $G_{W/L} = G'_{W/Y} + G'_{Y/L}$. So solving for $G'_{W/Y}$, we get:

$$G'_{W/Y} = G_{W/L} - G'_{Y/L} \tag{4}$$

That is, the growth rate (or rate of change) of the share of wages in *GDP* is equal to the growth rate of the average wage minus the growth rate of the average productivity of labour. Notice also that the growth rate of the share of wages in *GDP* would correspond to the growth rate of the average labour-unit cost of the economy.

Table 2. Contributions to the Growth of Income *per capita* (in percentage points, pp)

Period	$G'_{Y/K}$	$G'_{K/L}$	$G'_{L/Na}$	$G'_{Na/N}$	$G_{Y/N}$	$G'_{W/L}$	$G'_{Y/L}$	$G'_{W/Y}$
1996-2000	-0.8	4.0	-0.7	0.5	**3.1**	1.2	3.2	**-2.0**
2001-2005	0.3	1.8	0.5	1.1	**3.7**	1.9	2.0	**-0.1**
2006-2010	-1.1	2.1	1.0	0.6	**2.7**	2.6	1.0	**1.6**
2011-2015	-1.1	2.6	0.7	0.5	**2.7**	1.8	1.4	**0.4**
Average 1996-2005	-0.2	2.9	0.7	0.8	**3.4**	1.5	2.6	**-1.1**
Average 2006-2015	-1.1	2.4	0.9	0.6	**2.7**	2.2	1.2	**1.0**
Average 1996-2015	-0.7	2.6	0.4	0.7	**3.0**	1.9	1.9	**0.0**

Table 2 shows the growth contribution of capital productivity ($G'_{Y/K}$), capital intensity ($G'_{K/L}$), employed-labour participation ($G'_{L/Na}$) and the proportion of active population-to-total population ($G'_{Na/N}$) to the growth rate of income per-capita ($G_{Y/N}$). In other words, the former four represent the contribution in terms of percentage points (pp) to the latter, so they add up to the value of the latter. As a whole, the capital productivity (*Y/K*) contribution has been negative, except for 2001-05 where is slightly positive, becoming a negative contributor to the growth rate of *GDP per capita* over the whole period, which made the productivity of labour fall too (i.e. $G'_{Y/K} + G'_{K/L}$). This is consistent with the declining or constant optimal incremental capital productivity as shown in the Appendix. Capital intensity (*K/L*), however, represents the most important contributor to the *GDP per-capita* growth rate, representing for the whole period around 70% of the positive contributions to such a rate. This means that it has also been contributing to compensate for the decline in capital productivity. The remaining 30% of the rate has been carried by both employed labour participation (*L/Na*) and active population participation (*Na/N*). Does this mean that it is the quantity rather than the quality of resources that appear to be largely the driving force behind the growth of output? To help sort out such question, we turn to our proposed decomposition of total factor productivity in the next section. But before let us have a look at labour-income participation in total *GDP*, which is represented in growth rates in the last three columns of Table 2 above.

Three important observations come from such data. First, the growth rate of the average real wage of the economy (or real wage rate) has been systematically increasing over the sample period. Second, the productivity of employed labour (i.e. $G'_{Y/K} + G'_{K/L}$) has been positive all along, representing some 65% of the growth rate of GDP *per capi*ta, mostly on account of capital intensity, as shown above. And third, the previous two rates have on the whole made the growth rate of labour-income participation in GDP about even for the whole period, which is consistent with other sources that show a wage participation in value added of around 42% over this period (Banco Central, 2016). In other words, the gains in labour productivity have been proportionally passed to labour income on the whole, but not in a stable manner. The 1996-2000 period shows that this transfer falls significantly short of it, then improving but still negative over the 2001-2005 period, and then showing a positive but declining excess over the last two periods. This also mean that the average labour-unit cost (or wage cost to produce one unit of GDP), which is another way to look at the

employed-labour income share in GDP has been about constant over the whole period. The text recommendation is that average wages should grow at the same rate as labour productivity. If income distribution was not an issue, i.e. if the Gini coefficient or any other measure shows low levels of inequality, then the result above would be of little concern, as long as it was systematic. But in the case of Chile, where inequalities are high (Casen, OECD), this result is troubling as it may show a persistence of inequality. Of course, labour productivity should grow at higher rates to secure a stable reduction in inequalities, but causation may also run the other way, i.e. higher wages may stimulate higher productivity (Taylor, 2004; Peach & Stanley, 2009).

The analysis above accounts for the evolution of some important structural contributors to the growth of the Chilean economy up until 2015. The significant reforms that started in early 2015, which also created significant political opposition and conflict, together with a deep slip in international commodity prices (notably copper, still the main Chilean export) did upset the economy and its GDP growth rate up until the time of this writing (Ffrench-Davis, 2018). The reforms however are only likely to start consolidating and delivering their aims over the medium term.

4. A Decomposition of Total Factor Productivity (*TFP*)

If we combine an accounting decomposition of the growth rate of labour productivity (equation 5) with a standard production function growth accounting (equation 6), we can then derive a decomposition of *TFP*.

$$G_{Y/L} = G'_{Y/K} + G'_{K/L} \tag{5}$$

$$G_{Y/L} = G_{TFP} + \alpha G'_{K/L} - \gamma G_L \tag{6}$$

Where and (implicitly) are the income elasticities of capital (*K*) and labour (*L*), respectively, while takes the slack for $\alpha + \beta + \gamma = 1$. This means that if $\gamma = 0$, then the economy would be under of constant return to scale (CRS). In turn, if $\gamma < 1$, then the economy would be under increasing return to scale (IRS), and if $\gamma > 1$, then the economy would be under decreasing returns to scale (DRS). So if we equalize (5) and (6) and solve for G_{TFP}, after manipulating we obtain:

$$G_{TFP} = G'_{Y/K} + \beta G'_{K/L} + \gamma (G'_{K/L} + G_L) \tag{7}$$

Where the term $G'_{K/L} + G_L$) is about G'_K) when the yearly G_L is small, which is normally the case. So given that G'_K has been positive and relatively large over our target period, then if the economy exhibit increasing returns to scale, i.e. $\gamma < 0$, assuming an unchanged β, G_{TFP} will be smaller than under constant returns to scale (CRS). So unless the economy exhibits decreasing returns to scale, which is highly unlikely, this means that *TFP* under CRS should be considered as an upper limit, ceteris paribus. In the table below we assume CRS (i.e. $\gamma = 0$) under the above considerations. We first assume $\alpha = 0.5$, which seems to be the standard approach in Chile (Beltran 2017, Fuentes et al., 2006; Dipres; CNP). That is, they use some calculation of the share of capital income in *GDP* in lieu of the elasticity α, which as indicated above may be unwarranted on the grounds that this implicitly assumes perfect competition, and explicitly assumes a constant elasticity over the whole period. In addition, CRS might not be an appropriate assumption in all periods. The latter means that under IRS the values for *TPF* below are bound to be smaller, as capital and labour are assumed to have enhanced themselves endogenously, being pulled by productive and organizational changes, reducing therefore the role of the exogenous *TFP*. We then produce an eclectic alternative elasticity $\alpha*$ by simply averaging the capital-share value of 0.5 with our optimal incremental elasticities from our method in the Appendix (Table A1), which generates one different elasticity for each period (last column). Below we show both results, i.e. with and α and $\alpha*$.

Table 3. Contributions to TFP Growth in percentage points under CRS(4)

Period	α = 0.5, β = 0.5			β = 1−α*			α*
	$G'_{Y/K}$	$\beta G'_{K/L}$	G'_{TPF}	$G'_{Y/K}$	$\beta G'_{K/L}$	G'_{TPF}	
1996-2000	-0.8	2.0	**1.2**	-0.8	1.4	**0.6**	0.65
2001-2005	0.3	0.9	**1.1**	0.3	1.4	**0.3**	0.82
2006-2010	-1.1	1.1	**-0.1**	-1.1	0.8	**-0.3**	0.62
2011-2015	-1.1	1.3	**0.2**	-1.1	0.9	**-0.3**	0.67
Average 1991-2005	-0.2	1.4	**1.2**	-0.2	1.4	**0.5**	0.74
Average 2006-2015	-1.1	1.2	**0.0**	-1.1	0.8	**-0.3**	0.64
Average 1996-2015	-0.7	1.3	**0.6**	-0.7	1.1	**0.1**	0.69

Y/K: capital productivity   α: capital elasticity to income

K/L: capital intensity   β: labour elasticity to income

TPF: total factor productivity   G': discrete growth rate (corrected for interactive terms)

α*: average (0.5, Opε$_{Y-K}$)

Table 3 shows the value of the growth rate of *TFP* (G_{TFP}), decomposed into the growth rates of capital productivity ($G'_{Y/K}$) and that of a fraction of capital intensity ($G'_{K/L}$). This decomposition, which we propose, shows that *TFP* growth (positive or negative) has mostly relied upon positive values for capital intensity, rather than capital productivity. Notice also that now G_{TFP} can be calculated directly rather than as a residual, which also means that is not quite the "coefficient of our ignorance", as it depends on known and quantifiable variables. What is behind such variables is however something more trying, just as what is behind of any macroeconomic variable, as we clarify below.

Recall that *TFP* theoretically represents anything that cannot be attributed to the growth of physical capital and labour of the same proportional productive quality or capacity[5]. So we call *TFP* any effect on income that goes beyond such a proportion. This then means that the growth of capital productivity above represents the rate of change in the embodied quality of physical capital and the disembodied architecture and organization to deploy it (including scale economies, technical efficiency, socio-political conditions, etc), while the growth of capital intensity represents changes in human capital (education, training, nutrition, health, motivation, working milieu, etc) and their socio-economic conditions and adaptations to work efficiently with both more capital and new technology. Both contributions are interrelated, but changes in capital levels and technology, whether motivated by competition, catching up, sectoral shifts, learning by doing and so on, are likely to drag and pull a good deal of the way labour is enhanced and deployed[6]. If this is so, then a good deal of fast capital accumulation represents actually important social and economic qualitative changes, which are encapsulated under the heading of total factor productivity and/or increasing returns to scale.

Under the above assumptions for α*, in terms of averages since 1996, the growth rate of *TFP* has contributed to the growth of *GDP per* worker only 0.1% a year. This being positive, but low, in the first two periods, while negative in the last two periods. This is around the results in terms of *TPF* growth average and trend from other studies, which vary significantly between authors and studies, as shown in note 4. The explanations for it are controversial, but there appears to be some acceptance that the significant slowdown after 1995 coincided, first, with the Asian crisis and the abandonment of countercyclical policies; second, with the World Recession and the necessary ensuing adjustments; and third, with the unavoidable upset brought by long-delayed economic reforms that started at the beginning of 2015 (Ffrench-Davis, 2018). And all along there were pretty unstable, small and negative GFCF growth rates, especially towards the end of our period (Banco Central).

It is apparent from the data that despite the assumption of a constant elasticity of capital, the *TFP* contribution to the growth rate of *GDP* has been variable over time. It is however likely that the elasticity of capital has been moving together with their productivity, following the optimal incremental elasticity of it (see Appendix). But it may also be the case that overall capital elasticity was higher than 0.5 on account of likely increasing returns to scale (IRS), especially in the period of strong positive reforms, which came together with the restoration of democracy after 17 years of dictatorship (i.e. 1991-1997). If IRS is considered, this would have likely produced some significant differences for the *TFP* contribution to the growth rates, making it smaller over such a period. This simply means that focusing on *TFP*, while ignoring the possibility of IRS and the level and variability of elasticities, is likely to be misleading, especially for comparisons over time, let alone across countries.

5. Conclusion

We started by decomposing the actual growth rate of *GDP per capita* into the growth rates of capital

productivity, capital intensity and labour participation. It shows that the most important positive contributor has been capital intensity, which for the whole period represents around 70% of the per-capita GDP growth rate, compensating for the negative contribution from the growth rate of capital productivity. In turn, labour participation has been contributing some 30% of the growth rate of GDP *per capita*.

We then propose a decomposition of total factor productivity (*TFP*) by combining an accounting decomposition with a standard production function growth accounting. The result is that the contribution to *TFP* growth can be separated into the growth of capital productivity and a fraction of the growth of capital intensity. Assuming CRS and using a combination of the standard elasticities used by other authors and our incremental optimal elasticities (see Appendix), we showed that the growth of *TFP* has been unstable and relatively poor or negative. Over the whole period, on average, *TPF* growth has no contribution to GDP per-capita growth rate. That is, despite that capital intensity has positively contributed to the *TFP* growth rate, the capital productivity growth rate has negatively contributed to it, undoing the former. In our example, 31% of the growth rate of capital intensity is actually contributing to *TFP* growth, which has been compensating for the negative contribution of capital productivity to it. The aim here was also to show that it seems unlikely that the marginal capital elasticity is actually constant over time, and also that capital elasticities may be larger than the ones normally used in production function studies in Chile.

Finally, recall that *TFP*, theoretically, represents anything that cannot be attributed to the growth of physical capital and labour of the same proportional productive quality and conditions. The growth of capital productivity represents the rate of change in the quality of physical capital and its production environment, while the growth of capital intensity represents changes in human capital and its socio-economic conditions and adaptations to work efficiently with both more capital and new technology, these two growth factors acting in strong interrelation. So qualitative changes especially associated with the latter seem to have been important, despite the negative *TFP* growth contribution from the former.

Notes

(1) We proposed and applied this method, which we termed OCM (optimal consistent method), to OECD and Latin American countries, showing comforting levels of accuracy between our capital stock series and those coming from other *studies and* official sources (e.g. Hofman 2000; OECD 2001), despite the use of significantly less data (see Albala-Bertrand, 2010). In addition, Hao (2006, 2004) compared results from the OCM for China and other existing capital series for China showing similar levels of accuracy. In contrast to other methods, the OCM takes account of measures of the productivity of capital and output at optimal levels, which are integrated into the estimation method itself. This in addition contributes to dampen productivity fluctuations due to actual capital use or idleness, which may improve the estimate of a capital stock benchmark (see Appendix).

(2) That is, the basic data on GDP, GFCF, and price indices/deflators, comes from the Central Bank of Chile; data on population, labour force, employment, wages comes from the National Institute of Statistics of Chile; while regular studies about productivity come from the Budget Directorate (Dipres) of the Ministry of Finance, and capital stock series and depreciation from particular studies carried by staff of such institutions (Fernandez & Pinto 2017). All monetary data has been made constant to 2008 prices, unless otherwise indicated and all series are smoothened into 3-year moving averages to prevent the undue influence of rogue years.

(3) When using the logarithm transformation to produce continuous growth rates, the interactive terms are lost, which may produce some statistically significant differences from actual data, especially over the longer term, and even more if the growth rates are large. So we simply stick to discrete first differences.

(4) Of course, the estimation of *TFP* is a cottage industry, so other authors produce elasticities significantly different from the ones used here, showing a large variability between them. For a comprehensive reporting on them, see Beltran (2017). Among such sources, every year, the Ministry of Finance via Dipres (Budget Directorate) produces a set of given aggregate statistics that include *TFP*. They ask a number of known economists (between 15 and 19) to produce a forecast for the next 6 years, starting with the year in question. By the time of the reports, the latter is already in August, so it is meant to be rather accurate for this year. The results for the *TFP* contribution to *GDP* growth rates for this year, let alone the forecast ones, have wide varieties, to the point that the two extreme values are removed. For example, for 2009 the *TFP* range is -0.9 to -3.91, for 2012 is -0.72 to 1.50, for 2015 is -1.6 to 0.7, and so on. At the beginning of the report the economists are mentioned with a number and their full names. In the stats reporting, however, you have only the number and the estimation associated to that number with a clear footnote that warns the reader that the number here does not correspond to the number associated to the economist name. In other words, the

participants are so fully aware of the inaccuracy of results that prefer to keep their names confidential. But also it is a more honest exercise, as it avoids both collusion and public pressure, if not mockery. Our paper results fall well within the said variability. But the point is to show a *TFP* decomposition and in passing the possible difference between using CRS and IRS, whatever the initial levels of elasticities. The use of only two factors is sometimes called multifactor productivity (MFP), rather than total factor productivity (TFP). But as all the referred sources call it "TFP", we stick to it in this paper.

(5) That is to say that given a constant elasticity of capital (or labour), any additional percent increase in the factor, will produce exactly the same proportional effect on income as any previous percent increase of that factor, decreasing returns notwithstanding. Physical capital growth, via investment, is counted at the cost of production or its market value, and that of labour in employment levels, whether in number of hours or that of individuals. This has little to do with the productivity of capital or labour, which is then, in growth terms, encapsulated in a fixed elasticity over time.

(6) This is what is sometimes called technological change, i.e. a societal concept, as distinct from technical change, i.e. mostly an engineering concept. So it is rather misleading to claim that persisting high GDP growth rates in some countries (e.g. China, South Korea, etc.) are mostly due to brute quantities, rather than qualitative changes (i.e. the "perspiration" vs "inspiration" tagging). The other normal claim is that as soon as these gains are fulfilled, this type of *TFP* is exhausted. But this ignores that, on the one hand, this type of *TFP* sets a high platform for endogenous innovation and, on the other, even if that was not the case, countries can lock to the *TFP* of developed countries via imports of technology and know-how, a pattern associated with globalization. A mixed of these two is of course more likely.

(7) Linear programming is an empirical technique that optimizes an objective function via its defining parameters, subject to given inequality constraints, by means of the Simplex method (Hess, 2002). For the optimization, we use the GAMS (General Algebraic Modelling System) software. We estimate our optimal parameters over 5-year periods, so we assume them constant at optimal level, over such periods. The constancy of capital-output ratios, especially at optimal levels, is a reasonable assumption, which can come about either via correcting capital series by removing idle capital (which is hardly straightforward) or by optimizing the productive capacity of uncorrected series of capital or investment over the target periods, as we have done here (Albala- Bertrand 2010). We also assume that capital is the dominant factor of production, in the sense that it drags or pulls the other factors in the economy. This is standard assumption, explicitly or not, in many growth models and empirical models, e.g. Harrod- Domar model or the AK endogenous model, among others (Thirlwall, 2011; Taylor, 2004; Aghion & Howitt, 1998; Blades, 1993; Jones,1975), which should be acceptable, especially when focusing in shorter periods, and also when labour availability does not seem to be a constraint, as in Chile over our target period.

(8) We also averaged the depreciation rates estimated by the Central Bank of Chile over our 5-year periods, so implicitly we assume the same depreciation over it.

(9) The incremental income elasticity of capital can be defined as $\varepsilon_{Y-K} = (\Delta Y/\Delta K)/(Y/K)$. Then *$\Delta Y/\Delta K$* comes from our 5-year incremental optimal capital productivity (Op *$\Delta Y/\Delta K$*), while for *(Y/K)* we used the optimal Y from the OCM and the estimated K series from Fernandez & Pinto (2017), all in 5-year averages. This should give us an optimal elasticity, as this K series contains the total estimated capital without discounting for idleness. So it is a more accurate measure of average capital productivity than using the actual income, as the latter is likely to underestimate such productivity, i.e. actual income, as a rule, is bound to be on average lower than the optimal one, so its productivity will also be lower by using the same estimated capital levels.

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Appendix: Estimation of the Optimal Incremental Indicators

Below we estimate the optimal incremental capital productivity and the optimal incremental income elasticity to capital by means of a linear programming approach. Following a variation of our proposed method to calculate a reasonable benchmark capital stock with little data availability (see Albala-Bertrand 2010), for each year, output (Y) is defined as $Y_t = Y_{t-1} + \Delta Y$, which is a definition of a first difference. From here, we apply a simple functional mechanism via the productivity of capital to the two right-hand side terms, so that $Y_{t-1} = \delta b K_{t-2} \mu$ and $\Delta Y = \delta_a I_{t-1}$, where δ_b and δ_a are respectively the average and incremental capital productivities, while $\mu = (1-\lambda)$ is the depreciation rate, K is the capital stock, I is investment, and "t" is any given year. The depreciation rates used are the 5-year averages that come from the capital stock estimation carried by Fernandez & Pinto (2017). This functional form assumes that labour, required row materials and other productive requirements are available, which may not be too strong assumptions for Chile. These requirements, by the way, are almost always assumed as available in production function studies, whether that is the case or not.

We also assume the standard convention that new capital becomes productive with one year lag. Optimal output is then defined as $Y^*_t = \delta_b K_{t-2} \mu + \delta_a I_{t-1}$. Where $\delta_b = Y^*/K$ and $\delta_a = \Delta Y^*/\Delta K$ are respectively the average and incremental capital productivities, corresponding to that optimal output, and the symbol "$*$" denotes "optimal". Let $K_{t-2} = K_{by}$ be the base-year capital stock. Then the iterative solution of the above equation for any one year "t" is:

$$Y^*_t = \delta_b K_{by} \mu^t + \delta_a \sum_{i=1}^{t} I_{i-1} \mu^{(t-i)} \tag{8}$$

Where the year "t" ranges from 1 to n. The base year K_{by} would correspond to the year before the 5-year periods for gross capital formation (*GFCF*) and *GDP*, which we use to estimate the said parameters (e.g. 1995 when the *GFCF* series start in 1996). The initial or base-year product $\delta_b K_{by}$ and the incremental productivity coefficient δ_a are the two parameters that our estimation approach will throw. But in this paper we are only interested in the latter, as this would correspond to the incremental productivity of capital, i.e. the productivity of the accumulated investment over our 5-year periods. We will also use Y_t^* to estimate the optimal incremental income elasticity to capital, as explained later. We then estimate the said parameters by means of a standard linear programming (LP)[7,] which takes the following form (Ibid.):

Minimize:

$$Z = \sum_{t=1}^{n}(Y^*_t - Y_t) = (\delta_b K_{by} \sum_{t=1}^{n} \mu^t + \delta_a \sum_{t=1}^{n} \sum_{i=1}^{t} I_{i-1} \mu^{(t-i)}) - (\sum_{t=1}^{n} Y_t) \tag{9}$$

Subject to: $Y^*_t \geq Y_t, \delta_b K_{by} \, and \, \delta_a \geq 0$

Where n = 5 corresponds to the length of our series (e.g. when 1996 is the initial year for GDP and GFCF, then 2000 would be the last year, and the base-year capital stock would then be 1995). We estimate such parameters from a moving 5-year period from 1996 to 2015. This then generates our target parameter a, i.e. the optimal incremental capital productivity, over such period. This is then averaged in 5-year periods from 1996 to 2015.

We apply the above methodology, using the data for investment (*GFCF*) and output (*GDP*) that comes from official statistics. To prevent a single rogue year from having undue influence on the optimal point, we apply a three-year moving average to both series over the sample period. Finally, all series have been made constant to 2008 prices via available deflators[8].

Table A1. Optimal Levels of Incremental K-Productivity, Average K-Productivity and Income Elasticity to Capital

Period	Op$\Delta Y/\Delta K$	OpY/K	Opε_{Y-K}
1996-2000	0.35	0.43	0.8
2001-2005	0.47	0.41	1.1
2006-2010	0.30	0.41	0.7
2011-2015	0.32	0.39	0.8
Average 1996-2005	0.41	0.42	0.98
Average 2006-2015	0.31	0.40	0.78
Average 1996-2015	0.36	0.41	0.88

Op $\Delta Y/\Delta K$: optimal incremental K-productivity

Op Y/K : optimal average K-productivity

Op ε_{Y-K} : optimal income elasticity to K

Table A1 shows the optimal incremental and average capital productivities, and the optimal income-to-capital elasticity[9] from 1996 to 2015, split in 5-year periods. It shows that incremental capital productivity has fallen towards 2015, after an increase in 2001-2005. This also shows that the average capital elasticity over the whole period is around 0.9, with a larger average over 1996-2005 of around 1.0, decreasing to around 0.8 towards 2006-2015. The importance of this is simply that (i) it seems unlikely that the actual economy, as distinct from a theoretical production function, exhibits a blanket constant marginal capital elasticity, (ii) the marginal capital productivity may be larger than the ones normally used, and/or (iii) constant returns to scale may be too strong an assumption. The standard approach is first to assume constant returns to scale, but increasing returns may also be an acceptable proposition, especially when developing countries grow fast in some periods; second, to assume that capital elasticity can be replaced with the capital share in total income, so implicitly assuming perfect competition, which may be highly unlikely; and lastly the use a of a blanket constant elasticity over the whole period, which may be unwarranted.

The Role of Technology, Organization, and Environment Factors in Enterprise Resource Planning Implementation Success in Jordan

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Abstract

In many ways, the application of Enterprise Resource Planning (ERP) systems is useful. In today's business arena, ERP is regarded as a necessity. Implementation of ERP is costly and requires a lot of efforts but in Jordanian organizations, its success rate has been unsatisfactory. Hence, this study attempts to identify factors linked to implementation success of ERP in Jordan. The strategic factors are examined and they include technology adoption, web site service, competitive, top management support, change management, business process management, and trust. Questionnaires were distributed to ERP users in Jordanian firms which returned 141 responses which were analyzed. The results show significant linkage between technology adoption, web site service, competitive, top management support, change management, and business process management, and ERP implementation success. Nonetheless, the findings do not support the linkage between business process management and ERP implementation success. The findings show that firms can leverage TOE for improving ERP's implementation success to gain the anticipated benefits. Also, there is possibility that different critical success factors have different impacts on ERP benefits. Such finding expands the supposition of TOE theory that resources generate competitive advantages. This paper adds to researches on ERP by providing further evidence of the differing impacts of TOE on the successful implementation of ERP.

Keywords: trust, business planning, organization, technology, environment, enterprise resource planning

1. Introduction

The phenomenon of globalization in addition to increasing competition in the market can be a threat to organizations. As a respond to this threat, enterprise resource planning (ERP) is implemented (Taube & Gargeya, 2005 and Dong-Wook, 2018). Systems of ERP are now crucial to companies that attempt to obtain competitive advantages which include reduction of cost, improvements of business processes, integration of operations and departments all of which assist in improving the organizations in terms of their effectiveness and competitiveness (Vlachos, 2006). Somehow, to be implemented, ERP needs substantial amount of financial resources while also complicated, challenging as well as lengthy. Also, the success rate of ERP particularly in the context of Jordan is very low. Relevantly, Indihar S ̌ temberger and Kovac̆ic̆ (2008) mentioned the risk of losing competitive advantage by having flexibly customized business processes as another disadvantage (Damijan Ž, Andrej K, and Mojca, 2009).

System of ERP is a standardized mass-produced package of information technology (IT) which offers the first actual prospect for modern organizations in integrating the processes and functions of their business (Klaus et al., 2000; Davenport, 2000). ERP comprises software commonly used all over the world among organizations that seek to, among others, change their outdated legacy systems, achieve strategic advantage, and enhance inter- and intra-operational efficiency (Davenport, 1998; Ifinedo, 2006a). ERP is essentially an application package which combines all linking organizational divisions such as human resource, production, marketing and so forth. The system links activities of front-office and those of back-office in-house and external supply chain operations (Yang & Su, 2009). Still, Shao et al. (2012) reported failure among many companies in attaining the anticipated benefits of ERP even after they have implemented it for more than a decade.

Several studies (e.g., Ein-Dor & Segev, 1978; Thong et al., 1996; Bajwa et al., 1998) have identified a vast range of contingency factors which have positive impact on the IT systems success. Among these factors are: organizational

culture, size of organization, management of change, structure, business process management, top management support, internal IT support, and external (Competitive/ Trust). The past works have presented data on the impacts of some of the aforementioned contingency factors on the application of IT. Still, there should be caution when making generalization on findings and inferences to all contexts. Among the most extensively cited positive impacts in the success of newly spreading IT systems are top management support and engagement of quality vendors and consultants (Attewell, 1992; Bajwa et al., 1998; Wang & Chen, 2006). Furthermore, researches on the interaction between some of these mentioned factors and the success of ERP are still uncommon.

As indicated by Wilson (2012), the interrelationship between the organization and its connected parts is crucial or otherwise, it would be difficult if not impossible for businesses to establish dynamic interaction with their customers, suppliers or even the environment. Furthermore, Paradice (2009) and Wilson (2012) noted the necessity to have a comprehensive outlook pertaining to the interrelationships that are present between organizations, technology and the environment when addressing the effectiveness of ERP. As such, the effect of external trust of customers and the competitiveness of ERP which could guarantee the successful implementation of ERP for attaining the anticipated ERP benefits are investigated in this study.

Accordingly, TOE theory will be used in this study. Many studies have in fact employed this theory, particularly for the examination of the pre-implementation and implementation of some applications of IS, including ERP, as exemplified in the works by Bradford and Florin (2003), Zhu and Kraemer (2005), Al-Zoubi (2013), and that of Zhu et al. (2010). In addition, the applicability of contingency factors such as the technological, organizational, and external setting for the implementation of ERP and also benefit achievement have been expressed by several authors including Kouki et al. (2007), Kouki et al. (2010) as well as Schniederjans and Yadav (2013). The integration of TOE framework conjectured that various factors relating to organization will impact the implementation success of ERP.

The TOE framework is thus a fitting theoretical support as it recognizes the conceivable antecedents, and this could impart influence on the success of post-implementation. In this regard, based on the past works, it appears that all the ERP CSFs in the stage of post-implementation under the factors of external environment have been classed into three factors as follows: ERP external pressure, ERP external consultant support, and external trust. Albeit this classification, their relationships with post-implementation success are yet to be investigated empirically(Soltan , Jusoh , and Bagheri , 2015).

A number of antecedent factors have been found to be drivers to innovation as a whole, specifically the uptake of ERP. These antecedent factors include technological factors, organizational factors, and external/environmental factors (Nejib, 2013; Soltan et al., 2015; Al-Zoubi, 2013; Schniederjans & Yadav, 2013; Shaul & Tauber, 2013). The literature covering these variables is vast but some scholars (e.g., Zhu et al., 2010; Shaul & Tauber, 2013; Soltan et al., 2015; Ononiwu, 2013; Nejib, 2013; Schniederjans & Yadav, 2013) reported the lack in empirical works and comprehension toward the ERP antecedents. These authors also reported an inconsistency of results across diverse environments of business which may be attributed to the differences of size, countries, and type of industry. Jarrar et al. (2000) and Soltan et al. (2015) for instance, documented that the acceptance of new innovation among small business organizations is dictated by internally essential factors such as management of business processes and support from top management. Somehow, as stressed in the work of Soltan et al. (2015), the process of deciding on new technology adoption appears to be more influenced by exogenous reasons as opposed to business related factors.

Notably, in the context of developed countries, several factors are viewed as less crucial including the factor of IT application. However, in the context of developing countries such as Jordan, the same factor is regarded as more important. For instance, Jordan is facing a considerable barrier to ERP seeing that the application of IT necessitates adequate financial resources so that it would be accessible (Al-Zoubi, 2016;Soltan et al. 2015). Hence, within the context of the developing countries, certain factors including technological factors have been stressed while others were not addressed. Among business organizations, this has become a significant barrier to their successful ERP. Also, some factors which are proposed in this study have not been adequately addressed in the literature. These include the factor of business process management which has been reported as a significant impacting factor.

2. Literature Review

ERP systems were first in practice since the beginning of the 90s, and the complicated implementations of these systems have been discussed in countless publications. Accordingly, professionals and academics alike have proposed several solutions to improve the performance of these systems. The literature on ERPs can be broken down into three different approaches.

The first approach focuses on the process of implementation. As reported by Parr and Shanks (2000), there has

been considerable amount of efforts made in identifying and proposing several promising strategies. The proposed processes for attaining success in the first attempt have been ascertained (Donovan, 1999). Furthermore, the primary features of the essential tasks have been recommended (Al-Mudimigh et al., 2001). Some comprehensive works in this issue also have been carried out. For instance Luo and Strong (2004) analysed the boundary that is present between optimization and adaptation. Meanwhile, in the work by Esteves and Pastor (2002a), tools for evaluation of project were proposed.

Furthermore, some of the feasible avenues for best practices were explored by finding out the common points between successful companies and unsuccessful their counterparts (Mabert et al., 2003). Somehow, it appears that the use of ERP systems among organizations is increasingly more expansive. In Western Europe, more than 50% of the software licenses and maintenance revenues are related to accounts of ERP software and this rate is double the rate of the whole market of application software. The past few years have seen the implementation of ERP systems among countless of organizations, and as reported by Jacobson et al. (2007), through year 2011, the market for ERP remained expanding at a compounded annual growth rate of 11%. Yen et al. (2002) predicted ERP to remain one of the biggest, swiftest expanding, and the biggest leaders in the application software industry in the following decade.

The second approach revolves around the analysis of the created organizational problems. The implementation of ERP causes the overturning of the organization's whole structure. From the pecking order of user involvement, Amoako-Gyampah (2004) highlighted the difference in viewpoints where some may contradict with others, and these have to be appropriately managed. An organization that is dispersed physically (mono- or multi-site) is compelled to make certain choices (Markus et al., 2000) because as mentioned by Davison (2002), issues related to culture may arise. Project management, particularly in terms of its specific procedure has been reevaluated in Agile management (Alleman, 2002) and Goal directed project management research (Metaxiotis et al., 2005). In addition, the size of company will expectedly raise some questions. This is because as indicated by Muscatello et al. (2003), enterprise of small or medium-size will not deal with implementation in the manner that multinational companies would.

The third approach relates to risk management. This is factored by the fact that ERP implementations have high uncertainty level. Several studies have examined the risks that are linked to these projects (Bernard et al., 2002; Huang et al., 2004). In these studies, the techniques of identification used are different based on the study itself. As reported by Zafiropoulos et al. (2005), managers are also provided with tools for identifying the risks most applicable to their projects.

2.1 Technology Factors

In the context of container shipping, the use of IT in the transportation of messages and in attaining smoother transport service are common, and this is caused by the institutional pressure of ERP (Lun et al., 2008; Makris et al., 2008; Wong et al., 2009). Accordingly, some researchers including Mokhtarian (2004) documented the crucial implication of the aforesaid development in e-shipping context. E-commerce and e-collaboration for instance, have the capacity to offer far more flexible and all-inclusive interaction and communication to companies that implemented ERP, with less financial cost incurred.

In addition, in terms of the application of radio frequency identification, the utilization of an innovative active system of FRID assists in the security improvement in commercial transportation system (Rizzo et al., 2011). Here, web databases are commonly employed to review records of previous transport and performance. This enables the arrangement and forecast of future flow of container for ERP. Within the context of companies involving in liner shipping, their website's service attributes have been broken down by AL-Zoubi and AL-Zawaideh (2017) and Lu et al. (2005) into four categories namely: response of customer, tracing, schedules of vessel, and electronic document services

Internet connection makes available a number of services including services of support, online transaction, and market information. The Internet also provides information on performance and equipment. Using the platforms of website, companies of container shipping provide to clients, particularly shippers and consignees rates of freight and time of transit (Al-Zoubi, 2014). Through these platforms, shippers and consignees could obtain the necessitated information regarding the consignments. Hence, using the website of carrier, schedules of sailing could be obtained by clients, and they can also track containers while also able to access online auctions (Lu et al., 2007).

As indicated by AL-Zoubi and AL-Zawaideh (2017), the design factor of website plays a major role in the attainment of e-Satisfaction level. 67% of change in the usage behaviors e-government to the website design factor. In particular, Perceived ease of use has positive impact on adoption if user only visits the website for obtaining information. However, if user visits the website for transaction purposes, then, this construct

(perceived ease of use) might not impact the adoption rate within national e-Government portal of Jordan. AL-Zoubi and AL-Zawaideh (2017) indicated that satisfaction of Jordanians will increase from engaging in online governmental transactions.

2.2 Organization Factors

The implementation of ERP considerably affects the culture and structure of organization (Bosilj-Vuksˇicˊ & Spremicˊ, 2004; AL-Zoubi and Al-haija, 2018), and as indicated by Umble and Umble (2002), the success of implementation needs change in individuals, processes, departments, and in organization as well. Accordingly, change management has been reported by many studies as among the strongest factors which impact the success of ERP implementation, as can be referred in Table I. Change management involves management of human resource in addition to social changes that top management needs in introducing new processes and structures for equipping the organizational members in accepting changes and also in reducing their hesitancy in changing.

Change requires effective communication, and effective communication is necessary for all levels of business process, even when employees have no direct relation with BPM (Harmon, 2007). BPR also involves the transmission of power to companies of lower levels. Such transmission leads to adequate organizational culture and climate which causes employees to feel more accountable and important. In addition, BPR leads to changes of structure reflecting new tasks and responsibilities. Hence, La Rock (2003) reported the necessity to have a formal and clear delineation of every task and responsibility that is driven by the new process. Here, employees clearly are able to accomplish each new task. This also means that they are flexible enough to adapt to new changes in the organization, and demonstrate the willingness to learn.

Somehow, Hammer and Champy (2003) reported the common underestimation about teaching employees in organizations. In human resources, change management comprises activities including employee training particularly those impacted by change in business process, development of the needed new skills to cater to the new processes, and the development of systems of management for cultivating the values needed. Accordingly, Gargeya and Brady (2005) warned about the possible jeopardy to the anticipated success of the project when these vital factors within the project are not established. Subsequently, employees become less adversely impacted by the competitive business environment as the culture embraced by the organization has made them resilient. Somehow, Bashein and Markus (1994) and Umble and Umble (2002) stressed that everyone at every level must be educated.

As reported by many studies (e.g., Al-Mashari et al., 2003; Umble et al., 2003; Zhang et al., 2005, AL-Zoubi and Al-haija, 2018), top management support is an integral factor of ERP implementation success. Ngai et al. (2008) indicated top management support as crucial in the success of ERP implementation. This is because in general, ERP systems are large-scale and need a large amount of resources. Further, top management support should be given to the whole process of ERP implementation, not just at certain stages (Al-Mashari et al., 2003). In the implementation of ERP, top management support has two primary roles namely in the provision of the resources needed and in the provision of leadership (Zhang et al., 2005). In the implementation of ERP, Umble et al. (2003) and Dezdar and Ainin, (2011) reported that top management is responsible to communicate the company strategy to all members, create an understanding pertaining to the limits and abilities of the organization, show commitment, and formulate the rational objectives for the implementation of ERP

An initiative for transforming the process of business should come from the top, that is, from top management. This highlights the great importance of the transition of process ownership. Relevantly, Caron et al. (1994) indicated the importance of employees working with new processes in 'owning' these processes in order to assure success. Somehow, as mentioned by Hammer and Champy (2003), the majority of companies have inadequate owners of process, or, they appear to be defined to an insignificant extent, and this phenomenon is a resultant of the manner in which the traditional organization operates, which is not process oriented.

The processes of business are dispersed among the organizational confines. Hence, before reengineering, it is important to first identify the core business processes. As mentioned by Hammer and Champy (2003), organizations need to establish a process map with detailed business processes. This facilitates the understanding as well as sharing of the workflow in companies. A process relates to one or more tasks which change a set of inputs into a set of outputs specified. Process performance that is efficient and effective can be attained through the complete comprehension of its structure and the process flow. However, Kovacˇicˇ and Bosilj-Vuksˇicˊ (2005) proposed that it is practical to identify just those activities as processes, which directly or indirectly lead to the generation of end products as added value.

Equally, Zairi and Sinclair (1995) reported that companies in practice outline their core and sub-processes prior to BPR. In their work, the authors found that the majority of the companies (71%) have documented their core

processes. On the other hand, 21% of the companies had planned to do the same. Such findings demonstrate the awareness of companies of the significance of delineating and documenting a process. Hence, the percentage of documented sub-processes was 45% which is much lower, while 37% of companies reported their intention to document.

BPR failure can be factored by business processes that are inappropriately defined (Grover et al., 1995). In fact, processes that are defined too broad or too narrow can cause BPR project to fail (Hall et al., 1993). As expressed in the work of Lok et al. (2005), reengineering overhauls the old information system. However, BPR has been known to include the old systems. Nonetheless, consistent developments have compelled companies to discard their old and adopt new environment with new hardware and software. Such change decreases the costs associated with software maintenance, while also allowing new features. As such, BPR can be jeopardized when documentation is missing or unfinished.

Considering that the goal is to adopt new processes rather than improving the old one, it will not be necessary to analyze and document the present processes that comprehensively. Still, Hammer and Champy (2003) stated that the processes should be defined only to a degree where they are fairly understood, and this becomes a basis for a delineation of totally new processes.

2.3 Environment Factors

Environmental aspects are just as important as other aspects (organizational aspects and technological aspects). The aspects of environment are associated with the domain where a company executes its business, and this includes the industry the company operates in, the company's competitors, and transactions of the company with the government (Pan & Jang, 2008). In this study, external pressures and trust are regarded as two dimensions containing numerous CSFs for the success of ERP implementation. External pressures are competitive, regulatory pressures for the adoption of certain information technology. In this regard, competitive pressure and regulatory policy have been suggested to impact the adoption of ERP (Oliveira & Martins, 2011).

The significance of competitive pressure for innovation adoption, in addition to regulatory environment have been documented by several past works (e.g., Zhu & Kraemer, 2005; Zhu et al., 2003, 2004; Premkumar & Ramamurthy, 1995; Iacovou et al., 1995). Furthermore, by way of strategic aspects of ERP systems, competitive pressure and regulatory environment appear to significantly affect the competitiveness of a company as opposed to other technical aspects (Yen & Sheu, 2004). As frequently reported, the decision of an organization to invest in ERP technology is factored by the scrutiny of the competencies of IT that other organizations have and also by whether or not these organization have invested in ERP technology.

A positive relationship has been reported between external pressures, including competition, in past studies (Bradford & Florin, 2003). However, on the success of ERP implementation, there are still too few studies that look into the relationship between regulatory pressure and implementation. The past works on information technology and ERP were mostly focusing on the system adoption (Pan & Jang, 2008; Yen & Sheu, 2004; Zhu et al., 2004). Still, it is possible that these pressures are also positively related to the success of ERP implementation. Here, the organization is not simply to just adopt an information technology, but to do so effectively and efficiently. This is for reducing pressure from competition and from that caused by regulatory pressure. The effect of external pressure is also supported by resource based view because for mitigating pressures from the outside, firms will try successful internal capacities and a successful implementation of ERP as well. Also, the incentive for first mover advantage and to reduce regulatory problems will eventually provide focus toward successfully overcoming obstacles with ERP implementation (Bradford & Florin, 2003).

The factor that has not been addressed by the past works on ERP implementation success is the importance of trust. As previously mentioned, both user security and system security are crucial facets in success of ERP implementation (Goel et al., 2011). Trust between user, vendor, consultant and system is integral for the security of user and system. This study thus proposes the construct of trust to be among the key CSFs. The past works have highlighted the importance of relationships among people in an organization during the implementation of ERP (Amoako-Gyampah & Salam, 2004). Further, the theories used such as social capital theory discusses the importance of trust in both an individual and organizational level for achieving competitive advantage. Somehow, studies that examined the notion of trust within the community of ERP and the trust of organization towards the system are still too few.

Many have provided the definition of trust, and this construct has been defined in the context of organization as well as individual. For instance, personality psychologists perceive the notion of trust as characteristic of a person (Rotter, 1971). Meanwhile, among economists and sociologists, the manner in which institutions are established for reducing uncertainty and increasing trust in certain business transactions was demonstrated

(Bhattacharya et al., 1998; Zucker, 1986; Goffman, 1971).

Numerous types of trust have been investigated in studies. These trust types include: contractual trust, competence based trust, and goodwill based trust. Contractual trust relates to the confidence of trustor the trustee will or will not adhere to the agreements, while competence based trust is linked to the confidence of trustor that the trustee has the ability and readiness to do what they say they will do, whereas goodwill based trust is about the confidence of the trustor on whether or not the trustee will consider him (trustor) when making decisions (Chun Ha et al., 2011; Ireland & Webb, 2007).

Trust of organization towards ERP system is essential during implementation and for the future. Organization that has no comprehension towards the system may not gain trust. In the work of Rotter (1954), trust is defined as external locus of control. Trust has also been linked to the theory of attribution proposed by Heider (1958). The theory posits that if something seems to be going wrong with the system, people might attribute the problem to the system itself, as opposed to attributing it to their own doing. This inhibits trust.

Also, a system with low level of trust is not likely to be implemented by organization anymore. This restricts the opportunity for the system to be successful. Somehow, the impact of system trust pertaining to the successful implementation of ERP has been insufficiently explored by the past works. A trust link that fails to provide information in a timely manner could harm the implementation of project or system, such as those of ERP which mainly focus on the collection and maintenance of communications inside and outside an organization.

2.4 TOE Theory

In TOE theory, technological factor takes into account the significance of technological insight in internal and external viewpoints, and it is also valuable in the promotion of organizational output (Tornatzky et al., 1990). In these technologies, the information system (IS) comprises various phases, from the basic capacities to organizational compatibility. These technical features will facilitate the foundation for achieving benefits for the organization. Technological factors have been reported as a potent predictor in both ERP pre-implementation or post-implementation (Chwelos et al., 2001; Zhu & Kraemer, 2005).

Organizational factors comprise the existing resources to support and sustain the system acceptance and success. The managerial structure and the size of the organization, sensitive attributes of the organization which include the preparedness of the organization to support the arrangement, and an environment appropriate for system use (ERP system use) are also among the reported factors (Tornatzky et al., 1990; Chau & Tam, 1997). Conducive environment should be provided by the organization to assure effective implementation of the system. Activities of organizational are thus essential for ERP in order to promote businesses.

The environmental factors include the outside environment of the organizations which could impact the system's post-implementation by the central organization. Considering that the implementation of ERP in the organization is a complicated function, the process of operation of ERP needs in-depth information that the organization may not have, that is, knowledge. It should also be noted that organizations are affected by the industries that relate with them, the competitors, and the organization's ability in obtaining the resources others supply.

Table 1. Constructs, supporting theory and literature

Key	Construct	Theory	Supporting Literature
EET	ERP External Trust	Social capital theory, attribution theory, TOE theory	Soltan et al. (2015); Gefen (2004); Amoako-Gyampah and Salam (2004); White (2008); Abdullah (2009); Supramaniam and Kuppusamy (2011); Upadhyay et al. (2011); Basu and Lederer (2011);Schniederjans and Yadav (2013), Thi et al., 2014.
EEP	ERP External Pressure	Institutional theory, resource based view, TOE theory	Soltan et al. (2015); Pan and Jang (2008);Zhu and Kraemer (2005); Zhu (2004);Zhu et al. (2004); Zhu et al. (2003); (Kouki et al., 2007; Kouki et al., 2010); Nejib (2013) ; Schniederjans and Yadav (2013); Shaul and Tauber (2013); Al-Zoubi, 2016.
EECS	ERP External Consultants Support	Institutional theory, TOE theory	Soltan et al. (2015); Somers and Nelson (2004); Kouki et al., (2007; Kouki et al., 2010); White (2008); Kronbichler et al. (2009); Zhu et al. (2010); Shaul and Tauber (2013); Ononiwu (2013); Nejib (2013) ; Schniederjans and Yadav (2013)

3. Research Framework and Hypotheses Development

Taking into account this study's purpose, and in accordance with ERP CSFs' classification by some works Dezdar and Ainin (2011); Soltan et al,.(2015); Damijan et al., (2009); Princely(2008) and Schniederjans and Yadav (2013), this study presents a research framework as shown in Fig. 1. Accordingly, the hypotheses below were developed:

What are the factors that drive the enterprise resource planning implementation success among businesses in Jordan?

H1: Technology factors are positively related with ERP implementation success.

H2: Organization factors are positively related with ERP implementation success.

H3: Environment factors are positively related with ERP implementation success.
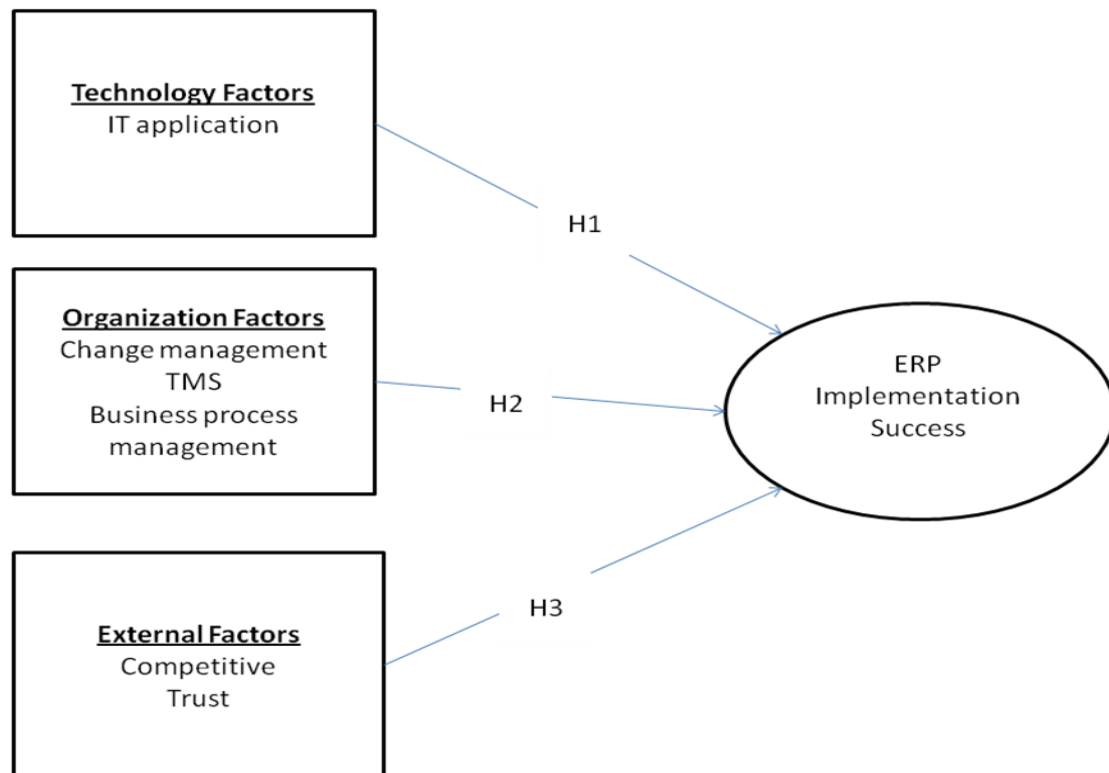
Figure 1. ERP implementation success model

3.1 Population of Study

Managers in Jordanian firms have been chosen as this study's target population. These firms comprise companies registered in the Chamber of Industry and Trade in Jordan. Managers in the sectors of service, industry, banking, and insurance comprise the study unit.

4. Data Collection and Data Analysis

A total of 290 firms were involved in the survey. A total of 141 responses were received in this study (48.6% rate of response), and the data obtained were analysed using Statistical Package for Social Science (SPSS). In particular, this study attempts to determine the causal relationship among the variables as the framework is proposing.

The relationship between three independent variables (technology factors, organization factors, and environment factors) and one dependent variable (enterprise resource planning) was explored in this study. For this purpose, 5-points Likert scale was used in measuring these variables. For this scale, the range of score is from the score of 1 which denotes 'not applied at all' to the score of 5 which denotes 'totally applied.' Reliability and validity analyses were also performed in this study. In addition, this study used the descriptive analysis for providing the description on the characteristic of sample and the respondents to the questionnaires, and also the independent and dependent variables. The hypotheses were tested using multiple regression analysis.

4.1 Reliability and Validity

Reliability analysis is associated with the evaluation of consistency level between multiple measurements of a variable. As for the analysis of validity, it concerns the degree to which a set of measures or a scale exactly symbolizes the construct (Hair et al., 1998). Validity has been explained by Blumberg et al. (2005) as the degree to which an instrument measures is anticipated to measure or what the researcher intends to measure. Cronbach's alpha coefficient was used to measure the instrument's reliability. As suggested by Bagozzi and Yi (1988), for all indicators or dimensional scales, the values of should be greater than the recommended value of 0.60. The Cronbach's alpha results for the independent and dependent variables are shown in Table (2).

Table 2. Cronbach alpha for the TOE and ERP

Variables	Number of items	Cronbach Alpha
Web site service	4	0.874
Technology adoption	4	0.877
Change management	2	0.856
TMS	4	0.911
BPM	3	0.798
Competitive	4	0.759
Trust	4	0.854
ERP	2	0.893

For all the variables tested, the coefficients of Cronbach's alpha were greater than 0.60. This demonstrates the reliability of the composite measure. Also, items that this study has chosen to measure the independent and dependent variables have already been validated and applied in past studies. Hence, the validity of the items is enhanced in this study. Furthermore, the faculty of business from six universities in Jordan reviewed the questionnaire items.

4.2 Respondents Demographic Profile

Table (3) presents the demographic profile of the study participants. As can be observed, the largest portion of respondents was male and employed as consulting engineers. Majority held bachelor degrees, and nearly half (47.5%) had more than 15 years of experience.

Table 3. Description of the respondents demographic profiles

Category	Category	Frequency	Percentage %
Gender	Males	98	56.2
	Females	43	43.8
	Total	141	100
experience	Less than 5 years	28	19.9
	5-less than 10 years	38	27
	10-less than 15 years	8	5.6
	More than 15 years	67	47.5
	Total	141	100
Job position	Consultant	54	38.3
	Administration	23	16.3
	Consulting	64	45.4
	Total	141	100
Qualification	Diploma	2	1.4
	Bachelor	120	85.1
	Graduate studies	19	13.5
	Total	141	100

4.3 Descriptive Analysis

Table (4) shows the results of analysis. As can be seen, in the context of Jordan, organization factors are used to a substantial degree with the mean score of 3.75, denoting the importance of organization factors. Additionally, high level of presentation demonstrates the presence of positive attitude pertaining to the top management support processes. Somehow, this study found that the factors of technology, environment, and resource planning of enterprise to be moderate. This implies the current presence of TOE activities among Jordanian firms. These firms appear to concentrate on enterprise resource planning in preserving their competitive advantages. The items shown in Table (5) comprise the mean scores for the factors of technology, organization, environment, in addition to the items associated with enterprise resource planning items.

Table 4. Overall mean and standard deviation of the study's variables

Type of Variable	Variables	Mean	Standard Deviation	Level	Order
Independent	**TF**	3.3	0.75	Moderate	
Variables	Web site service	3.4	0.7	Moderate	1
	Technology adoption	3.1	0.8	Moderate	2
	OF	3.75	0.76	High	
	CM	3.79	0.76	High	3
	TMS	3.91	0.85	High	1
	BPM	3.85	0.83	High	2
	EF	3.4	0.6	Moderate	
	Competitive	3.10	0.71	Moderate	2
	Trust	3.3	0.68	Moderate	1
Dependent Variable	ERP	3.57	0.82	Moderate	

Table 5. Mean and standard deviation of the study's variables

Web Site Service	Mean	SD	Level	Order
My firm actively instructs customers about how to use electronic commerce web sites	3.15	1.16	Moderate	1
Customers frequently use my firm's web site to enquire about sailing schedules online	2.66	1.34	Moderate	2
Customers frequently use my firm's web site to book space for containers online	2.10	1.36	Moderate	4
My firm's web site system can help integrate our supply chain partners	2.5	1.22	Moderate	3
Technology Adoption	**Mean**	**SD**	**Level**	**Order**
My firm adopts advanced IT to control container flow	3.55	1.21	Moderate	1
My firm adopts electronic data interchange (EDI) to improve transport operation efficiency	3.43	1.11	Moderate	3
My firm adopts a customer relationship management (CRM) system to collect market information and analyze it	3.45	0.9	Moderate	2
My firm adopts online transactions to reduce operational costs	3.33	1.04	Moderate	4
Change Management (CM)	**Mean**	**SD**	**Level**	**Order**
Employees learning ability	3.79	1.15	High	2
Employees adaptability on different task	3.86	1.06	High	1
Top Management Support (TMS)	**Mean**	**SD**	**Level**	**Order**
Top Management Supports The Adoption And Use Of Our ERP System	4.15	0.97	High	1
Different Departments Are Of Equal Importance	4.01	1.02	High	2
Employees Are Happy With The Changes That Top Management Decides On ERP Issues	3.77	1.17	High	4
Top Management Freely Share Information In Our Organization	3.96	1.04	High	3
Business Process Management (BPM)	**Mean**	**SD**	**Level**	**Order**
Defined business process owners	3.44	1.21	Moderate	3
Defined business processes	3.86	1.03	High	2
Documented business processes	3.94	0.901	High	1
Competitive	**Mean**	**SD**	**Level**	**Order**
Competitive advantage in the efficient logistics operations	3.55	1.41	Moderate	1
Competitive advantage in the effective ERP	3.33	1.21	Moderate	2
Competitive advantage in differentiating our ERP	3.22	1.31	Moderate	3
Competitive advantage in the reputation of our excellent ERP	2.98	1.21	Moderate	4
Trust	**Mean**	**SD**	**Level**	**Order**
Trust to systems has a positive effect on ERP	2.77	1.24	Moderate	4
Trust to vendors has a positive effect on ERP	2.87	1.24	Moderate	3
Trust towards ERP system has a positive effect on the intention to use ERP systems.	2.91	1.31	Moderate	2
Trust towards ERP vendors has a positive effect on the intention to use ERP systems.	2.99	1.05	Moderate	1
Enterprise Resource Planning (ERP)	**Mean**	**SD**	**Level**	**Order**
ERP implementation has a positive influence on business performance	3.92	1.06	High	1
ERP implementation in line with expected results	3.89	1.58	High	2

5. Hypotheses Testing Results

This study looks into the effect of the factors of technology (web site service and technology adoption), those of organization (change management, top management support, and business process management), and those of environment (competitive and trust) on resource planning of enterprise among firms in Jordan. Hence, the technique of multiple-regression was applied for hypotheses testing. Also, this study has chosen the value of 0.05 the level of significance (α-level). Further, the probability value (p-value) attained from test of statistical hypotheses is deemed as the decisive rule for the rejection of the null hypotheses (Creswell, 2009).

The obtained p-value of lower than or equal to α-level means that the null hypothesis is rejected while lending support to the alternative hypothesis. On the other hand, the obtained p-value of higher than the α-level means failure to reject the null hypothesis while the alternative hypothesis will not be supported. This study also checked the normality of the independent variables and the non-presence of the problem of multi co-linearity (a case of multiple regression in which the independent variables have high correlation themselves). Pallant (2005) proposed that the majority of the values inside the ranges which are satisfactory for normality (i.e. -1.0 to +1.0). Hence, this study also examined the skewness and Variance Inflation Factor (VIF). The results are shown in Table (6).

Table 6. Skewness and VIF for the independent variables

Variables	Skewness	VIF
Web site service	-0.33	1.71
Technology adoption	-0.31	1.66
Change management (CM)	-0.65	2.46
Top Management Support (TMS)	-1.00	2.42
Business Process Management (BPM)	-0.501	2.95
Competitive	-0.41	1.89
Trust	-0.37	2.45

Table 6 evidences that the values of skewness were in the range of normal values (-1.0 to +1.0). This demonstrates the normality of the independent variables' data. The values of VIF appeared to be lower than the critical value (10). This means that there is no problem of multi co-linearity among the independent variables.

5.1 Conceptual Framework

This study majorly aimed to find out the factors viewed as having linkage to the implementation success of resource planning. This study identified 7 factors from the relevant literature. In addition, a conceptual model was constructed in this study. This model examines the implementations of enterprise resource planning (ERP) at firm level. The framework employed in this study was grounded upon the Technology-Organisation-External (TOE) theoretical framework from Tornatzky and Fleischer (1990). Figure 1 highlights the factors of TOE derived from the factor analysis.

This study attempts to determine the factors that are linked to implementation success of resource planning. Hence, this study has chosen to employ linear regression rather than the regression model ordered.

5.2 Hypothesis

The research question in this study relates to the relationship between the factors of TOE and the implementation success of ERP among businesses in Jordan. For this purpose, this study performed the analyses of linear regression for examining the relationship between the dependent and independent variables. Table (7) highlights the results of hypothesis testing.

Table 7. Result for the study model (a, b, and c)

A)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.791[a]	.642	.641	.06170

     a.   Predictors: (Constant), Trust, TA, Competitive, TMS, BPM, CM, WSS

B)

ANOVAᵇ

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	53.044	7	7.578	141.191	.000ᵃ
	Residual	3.254	387	.008		
	Total	56.298	394			

a. Predictors: (Constant), Trust, TA, Competitive, TMS, BPM, CM, WSS

b. Dependent Variable: ERP

C)

Coefficientsᵃ

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.362	.050		7.187	.000
	WSS	-.038-	.016	.255	2.327	.020
	BPM	.018	.013	.027	1.385	.167
	TA	.198	.006	.430	3.494	.000
	CM	.280	.010	.511	2.975	.000
	TMS	.200	.005	.516	4.729	.000
	Competitive	.260	.008	.410	3.264	.000
	Trust	-.013-	.006	-.027-	-2.142-	.033

a. Dependent Variable: ERP

As can be observed in Table (7), a positive correlation appears to exist between TOE and ERP among firms in Jordan (r = 0.791). This denotes that both the independent variables and dependent variable change in the exact direction. Furthermore, the R Square value denotes the variation fraction in the variable of ERP which is explainable using 7 processes of TOE. Accordingly, 64.2% of the variability of ERP was explainable using TOE variables. Meanwhile, the data show F-ratio of 141.191 which appears to be significant at p < 0.05 (sig= 0.000). This implies a statistically significant effect of TOE on ERP. The alternative hypothesis is thus accepted.

As can be seen in the findings, with a significance level of (0.000), the obtained t value for service of website was 2.327, 3.494 for technology adoption, 2.975 for change management, 4.729 for top management support, 3.261 for competitive, and -2.142 for trust. For Business Process Management, the t value obtained was 1.385 with a level of not significance of 0.167.

As shown, the construct of trust obtained negative t value. This means that trust leads to the decrease in ERP value. The decrease amount is symbolized by the β coefficients (0.027). This implies that an increase in ERP by one unit is associated with a decrease of 0.027 in trust. Furthermore, the value of β was correspondingly 0.255, 0.430, 0.511, 0.516, 0.027, and 0.410. This demonstrates top management support as the most prominent ERP predictor among the surveyed Jordanian firms, followed by TOE.

This section generally provides the outcomes from the analyses of binary linear regression for identifying the factors seen as having linkage to the implementation success of ERP. Accordingly, the theory of technological diffusion guided the construction of framework for evaluating the implementation success of ERP. This framework employed 7 factors that are linked to ERP implementation success among firms. A total of 6 variables appeared to have linkage with ERP implementation success. From these 6 variables, 2 were technological context variables while another 2 were organizational context variables. The other variable was external context variable.

6. Discussion and Conclusions

The present study attempts to find out the factors linked to ERP implementation success in the context of Jordan. Hence, this section will present the results of the analysis. This study applied linear regression in investigating the relation of technological, organisational and external factors as independent variables with numerous ERP implementation success.

This study finds 6 of the 7 factors to have considerable linkage to ERP implementation success. Service of website, technology adoption, top management support, change management, competitive, and trust appear to be significant determinants of ERP successful implementation. Furthermore, among businesses in Jordan, the factors of technology, organisation and outside environment appear to considerably affect ERP implementation success.

Furthermore, greater level of explicitness and technology amassing can assist in the technological knowledge transfer within the organization. These factors can also increase the capacity in the implementation of technologies successfully. Through encouragement or support to their employees in ERP implementation and by providing them with training and education, firms in Jordan are able to increase their capacities in technological implementation. Also, as expected, factors of TOE show their significance. Based on the outcomes, the significant role of TOE in ERP implementation success is affirmed and this finding is in agreement with the past relevant works including Soltan et al. (2015), Pan and Jang (2008), Zhu and Kraemer (2005), Zhu (2004), Zhu et al. (2004), Zhu et al. (2003), Kouki et al. (2007), Kouki et al. (2010), Nejib (2013), Schniederjans and Yadav (2013) and Shaul and Tauber (2013).

Insignificant linkage between IT application (website service, and technology adoption) and ERP implementation success was found in this study. Such finding may be factored by dissimilarities in the respondents' business scales. This study primarily involves container shipping agencies which appear to be firm's managers with successful ERP implementation. These managers were from diverse business sectors in Jordan. Comparatively, the past works were primarily concentrating on large firms (e.g. Po-Hsing al., 2015). In addition, IT investment may have a short-term adverse impact on ERP implementation success. As such, it is necessary to evaluate the effect on ERP improvement of firm from the perspective of a long-term. Also, such insignificant linkage in website service and adoption of technology with ERP corresponds with the experiences of failure in some information services, for instance, customer relationship management systems (see Kouki et al., 2007; Kouki et al., 2010; White, 2008; Thi et al., 2014).

This study provides affirmation on the effect of all presented organization factors, the effect of top management support, change management and BPM, on ERP implementation success. In the past works, the mentioned factors are among the most important TOE and positively affect ERP implementation success. Hence, they hold significance in the projects of ERP systems implementation. The results that this study has obtained are also in support to the significance of top management's perception. This implies that if BPM is considered to be a foundation for business change, and this generates a solid and desirable impact on a successful implementation of ERP.

There are practical implications of the outcomes obtained by this study. First, it would be invaluable for companies to regard BPM as a foundation for a business change and increase its usage. Such increase in usage brings a solid as well as desirable impact on a successful ERP implementation. All success factors that this study has scrutinized should be considered. Hence, organizations should have understanding of them and take them into account. Such awareness will generate desirable impact on a successful ERP implementation. Furthermore, organizations should refrain from dismissing their ERP implementation project too early, owing to the fact that the anticipated outcomes could take time before they materialize. In fact, ERP projects can still be fruitful even if they do not fulfil what the organization requires. Hence, organizations should properly define what constitutes project success by going beyond the requirement of time, budget, and specification (Zhang et al., 2005; Damijan, 2009). Also, ERP can still lead to greater business effectiveness even if its implementation is not as efficient. It is common for organization to want to make deduction that projects are good when it shows results. Hence, organizations would increase activity and investment in such projects (Lok et al., 2005; Damijan, 2009).

Also, the factor of trust to businesses shows considerable linkage to the success of ERP implementation. Similarly, some authors found this factor to play a major role in the initiation of countless ERP implementation success (e.g. Dara., 2013; Dong-Wook, 2018).

Competition is among the key facilitators of ERP implementation. In the past works, this construct was reported as a noteworthy variable that initiates ERP implementation (e.g., Dara, 2013; Dong-Wook, 2018).

A new approach to TOE theory has been proposed in this study. In particular, this study highlights the crucial roles played by several new environmental antecedents of ERP implementation success. New environmental factors are thus presented in this work namely the factors of competitive and trust. Such addition enriches the body of knowledge concerning the role of the factors of environment in the effective implementation and preservation of ERP in implementation success. In general, there are a number of contributions that this study brings to the community of ERP highlighted next.

Firstly, this study adds to the researches in the domain of ERP by looking into the impact of ERP outside factors' critical factors on the implementation benefits of ERP. Secondly, this study adds to the theory of TOE by hypothetically demonstrating the great prominence of ERP consultant support, ERP external pressure, and competitive and trust over environmental critical resources to enhancing the benefits of ERP. This study's findings also show the ability of firms in leveraging CSFs for the improvement of success of ERP in implementation success to attain the anticipated benefits. Moreover, this study is able to show that different critical success factors may impact different impacts on ERP benefits. This notion is an expansion of the general supposition of TOE theory that resources generate competitive advantages. Next, further evidence is presented by this study, concerning the different impacts of CSFs on the implementation success of ERP.

7. Limitations and Future Directions

Several limitations were faced while performing this study and the first one relates to the issue of time and effort. As mentioned, this study was conducted on 290 ASE listed Jordanian firms (ASE, 2010. However, the researchers could not distribute the questionnaire to the whole population and gather more responses. In particular, this study employed email as an attempt to ease the response attainment. Unfortunately, this method appeared to be ineffective because the majority of the firms preferred to receive hard copies by way of drop and collect method. Another limitation to this study was poor cooperation given by some firms because of the issues relating to privacy even though the items of the questionnaire were constructed in a way that did impact the privacy of the firm. Hence, some firms declined the questionnaire right away. On the other hand, some firms agreed to participate, but they allowed only a specified amount of copies to be distributed to certain employees.

However, the researchers took steps to resolve these limitations. Firstly, a sample representing the entire population was chosen. In addition, to increase trust of respondents and assure privacy, visits and quick interviews were carried out for the purpose of explaining the aim of the questionnaire and the study. In addition, the questionnaires were personally handed to the respondents and the completed questionnaires were personally collected from them. The researchers also made the effort to acquire the overall background of consulting firms involved in this study.

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The Spillover and Transmission of Chinese Financial Markets Risk

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Abstract

After the 2008 financial crisis, the whole world financial markets became more fluctuates, the same to China also. It is necessary to pay great attention to high volatility problem in Chinese market, and also the uncertainty problem, risk accumulation and spillover effect come along with it. This paper calculates stock market return and builds financial stress index to explore the risk spillover effect. Empirical results show that the Chinese financial market have higher volatility than other countries. The Chinese stock market had higher dynamic market co-movement with international financial markets after 2008 financial crisis. What's more, this article also finds the financial risk spreads between China and US. When the US financial stress index increases, China's financial stress index experiences a larger increase. However, after the change in China's financial stress index, the US financial stress index has no obvious trend of change. So we should pay more attention to periods of Chinese financial market risk and its spillover.

Keywords: financial market risk; financial stress; spillover effect; risk transmission

1. Introduction

Since the global financial crisis in 2008, financial markets all over the world have suffered turbulence. Some economists hold the opinion that high volatility and rapid change will become the new norm for financial markets.

The reasons for the high volatility are complex. Since the financial crises, developed countries and emerging market economies tried to recover. However, it turned out nothing like they expected. As global political and economic environments keep changing, financial markets will be filled with uncertainty in the next few years or even farther into the future. There will be more dark horses, and high volatility will become a part of the global economic and financial world.

Economies of developed countries, especially the G7, are weighing less and less in the global economy, while emerging market economies are becoming more important. As an emerging market country, China is much more vulnerable to external shocks than developed countries, and its financial markets fluctuate more.

According to Chinese financial markets high fluctuation, the risks will spillover among China, US and another international countries. Financial spillovers are defined in this paper as the transmission of a risk shock in one country to asset prices in other countries. Financial spillovers in China could be transmitted to international financial markets through multiple channels, including international trade, price effects on tradable goods, financial flows, and even general market sentiment.

The main parts of this paper are organized by five sections. Section 2 shows the general review of financial risk in Chinese markets in by using Systematic Risk Index、VIX and stock market volatility. Section 3 and Section 4 shows the literature review and data description. Section 5 is the research methodology, including the DCC-GARCH model for stock market spillover effect and the construction of Chinese financial stress index for financial risk transmission. Section 6 is the empirical results of spillover effect and risk transmission.

2. The General Review of Chinese Financial Markets

2.1 A General Review of Systematic Risk in Chinese Financial Market

Brownlees and Eagle(2011) designed a systematic risk index(SRISK) from the aspect of insufficient funds and

venture behavior in financial institutions, and then improved it in the same year. SRISK measures financial institution financing gap at the time when a systematic financial crisis happens. They calculate SRISK in this way

$$SRISK_{i,\ t} = E_{t-1}(Captial\ Shortfall_i|Crisis)$$

This formula can be used to calculate how many funds a financial institution will need to keep it running during a global crisis, such as happened in 2008. From figure 1, we can see that although systematic risk has kept rising since 2000, its total level is still low. But since the economic crisis in 2007, the systematic risk appeared at a high level, along with a considerably higher volatility. SRISK has pointed out that global financial market structures have changed considerably, and high risk would be an ordinary condition of theglobal economy.
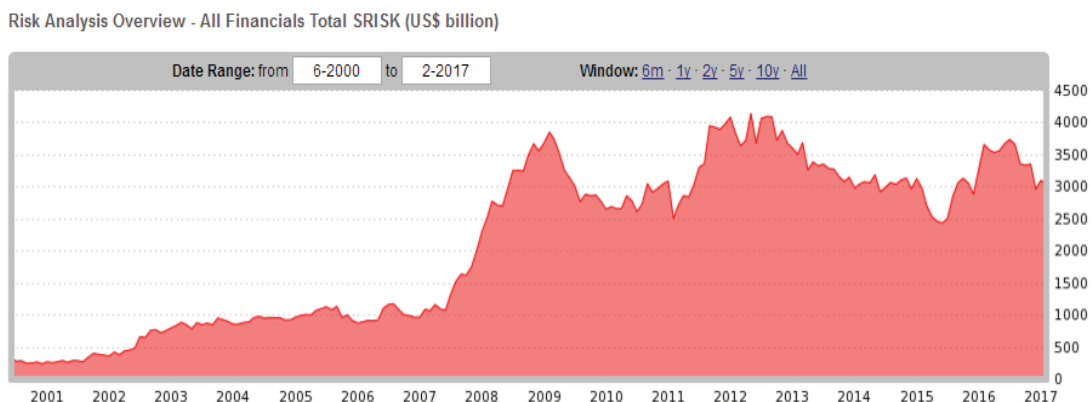
Figure 1. The total systematic risk of whole financial markets

Note. SRISK is calculated by Engle's team from VLAB. It's updated to 2017/2

Figure 2 below shows the systematic risks of some major financial markets in the world. As we can see, theChinese financial market has the greatest risk in the world. When a global economic crisis occurs, Chinese financial institutions will bear a loss of $700 billion. After China, come Japan, France, British and USA. Of the top 10 countries at the greatest SRISK , only China comes from an emerging market.
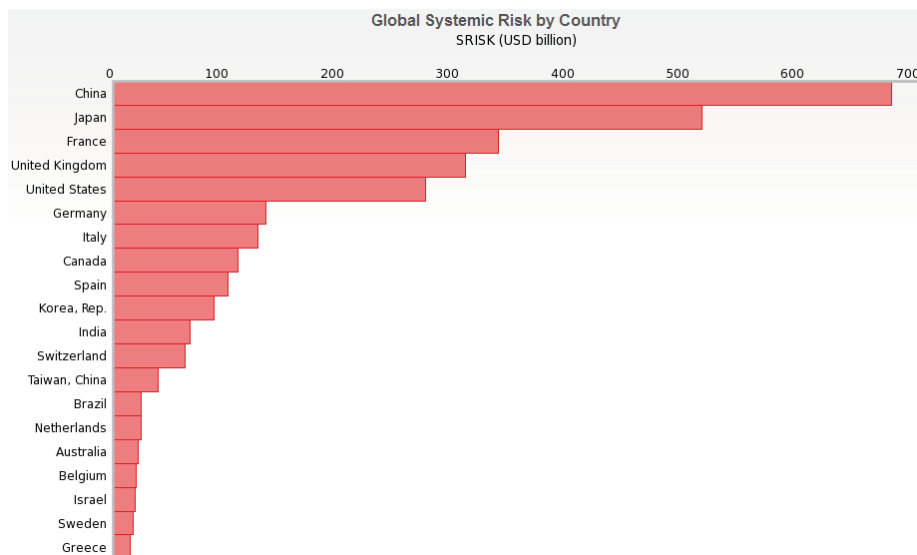
Figure 2. The rank of main international financial marketstotal SRISK

Note. SRISK is calculated by Engle's team from VLAB. It's updated to 2017/2

Figure 3 is systematic risk situation in China since 2008. We found that since financial crisis, systematic risk of Chinese market steeply rose. Although it dropped a lot in 2013 and 2015, it rose again in the last year 2016.
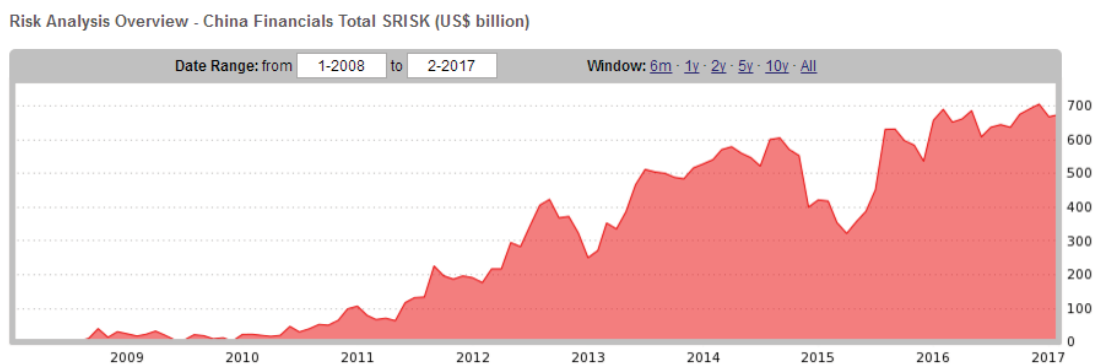
Figure 3. The total systematic risk in China

Note. SRISK is calculated by Engle's team from VLAB. It's updated to 2017/2

Although this method only includes total expected losses for the financial institutions and overlooks all other factors, it still is a valid way to calculate systematic risk, and illustrates a global impact. This analysis highlights high volatility in the Chinese markets, as well as shows uncertainty, risk accumulation and the spillover effect.. However, this topic is not just about the future development of China, but is also about global market stability.

2.2 A General Review of Chinese VIX

The VIX index is a measure of financial market volatility. It is also used to measure market risk and risk aversion levels of investors. A high VIX index makes investors leary of investing in the market; while a low VIX index stablilizes the market. The first chart below compares theVIX of the Chinese market with the American market and shows similar undulation trends and structures. In general, risk in the Chinese market is higher than risk in the US market. Chinese investors are more risk-averse than US investors. The second chart illustrates that in 2014, compared with all emerging markets, China market volatility and risk-aversion increased but followed other emerging market trends again by 2016..
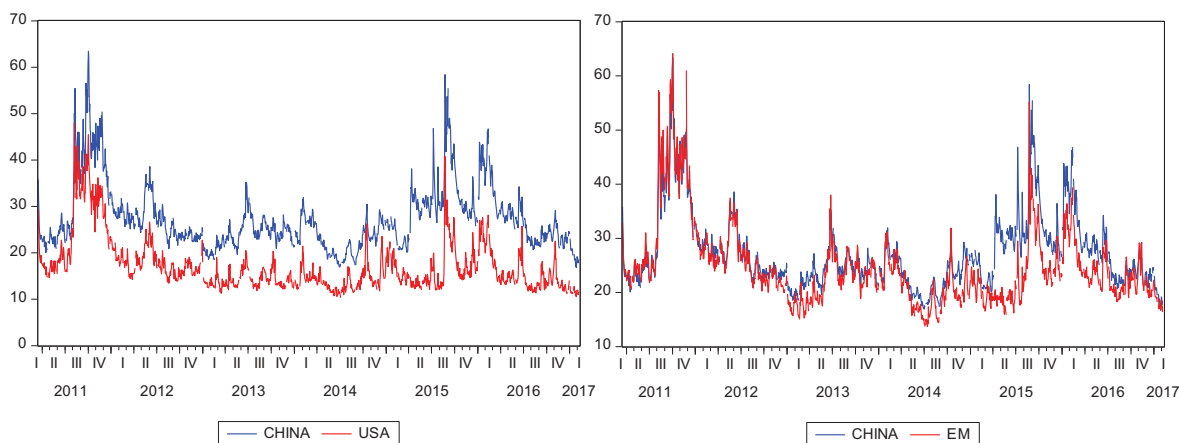
Figure 4. The volatility indices in China, US and Emerging Market

Note. Figure source: https://fred.stlouisfed.org/, sample period is from 2011/3/16 to 2017/2/10.

2.3 A General Review of Chinese Stock Market Volatility

According to stock market indices (CSI 300 index , S&P500 Index and MSCI index), the GARCH(1,1) model is used to estimate the volatilities of three stock markets (China, US and Europe).Compared with US and Europe, the empirical results show these characteristics of stock volatilities in China:

    1. Except during the 2008 financial crisis, China experiences higher volatility than other international financial markets.

    2. The Chinese stock market experienced high volaitility and structural change in 2007 and again in 2014. Specifically, volatility increased between 2007 and 2010. Then it dropped until 2014, when it surged up again.

    3. The US and European markets fluctuated wildly from the end of 2008 to the beginning of 2009. Then

they fell back quickly. In the middle of 2011, volatility increased again. Generally speaking, volatility of the American market is weaker than the European market.
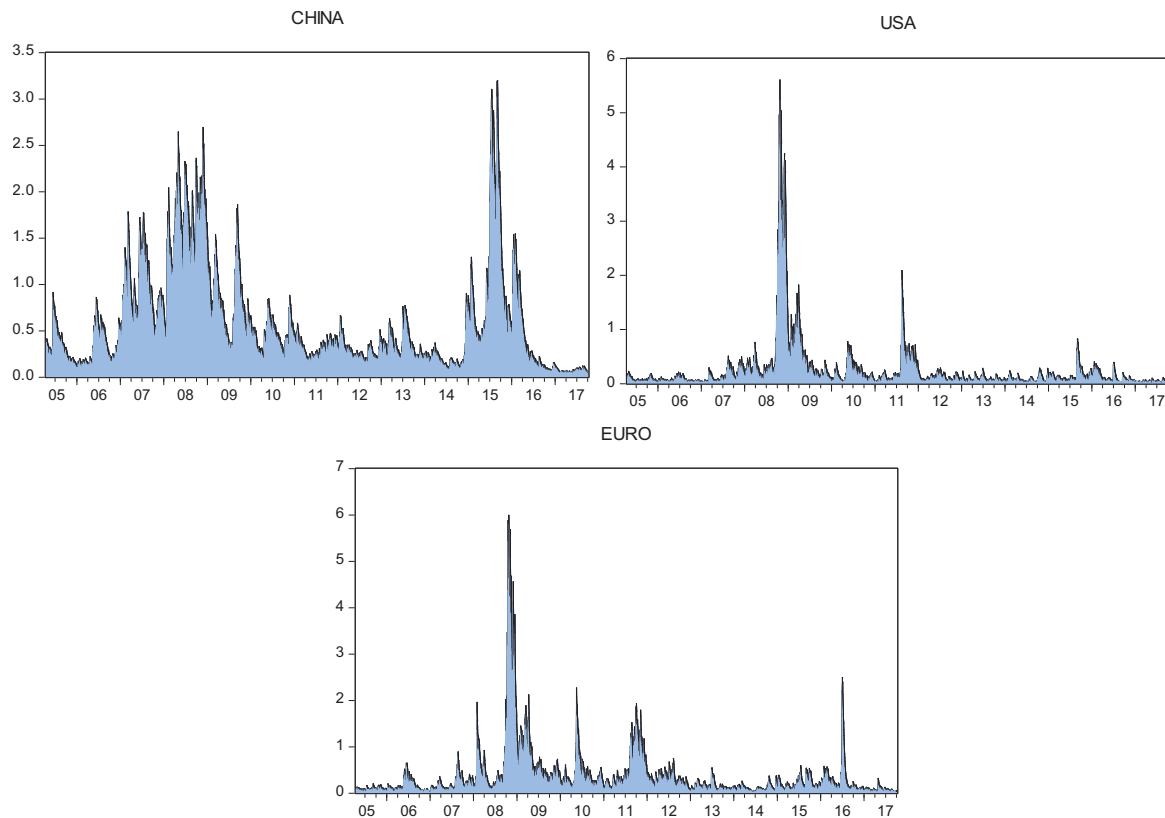
Figure 5. The volatility in international stock markets

3. Literature Review

Accurately determine the hidden dangers is the premise of ensuring financial security, we must accurately measure and effectively monitor the financial risk. The main measures of financial risk measurement are diverse. At the micro level, the mainstream indicators include the systematic expected loss value and the systematic risk indicator (named SES and SRISK, Acharya & Robert Engle, 2012), and the delta of the conditional value at risk (Δ CoVar, Adrian & Brunnermeier, 2008). They can measure the marginal contribution of financial institutions to overall financial risk. In addition, there is the Joint Crisis Probability Approach (Segoviano & Goodhart, 2009) which measures systematic risk across banks and portrays the interdependence of interbank risks. At the macro level, the mainstream methods are the composite index method and the early warning method (Frankel & Rose, 1996; Kaminsky, Lizondo, & Reinhart, 1998), which measures financial risk based on balance sheets and market data. This article needs to build a method that can fully reflect the China overall financial market risk and reflect its dynamic financial risk value. Therefore, this paper chooses the composite index method from the macro systematic risk level. The composite index approach is widely used and is especially important for developing countries that lack financial data. This method is feasible，continuity and flexibility. First, the method chooses various indicators related to financial market risk and then weights the indicators according to different weighting.

This paper uses the Financial Stress Index (FSI) to measure the systematic dynamic risk of financial market. It was first proposed by economists Illing and Liu (2003), which is a comprehensive index to estimate the macroeconomic financial pressure, through indicators of the four major financial markets (banking, stock market, bond market and foreign exchange market) measure risk and uncertainty. The IMF World Outlook Report (2008) using Cardarelli, Elekdagand, and Lall (2009), in which seven indicators were selected to measure the financial market risk by measuring the financial stress index of 17 developed countries to capture the corresponding stressful events. Empirical It is found that the financial stress index has a predictive effect on the real economy. Balakrishnan, Danninger, Elekdag, and Tytell (2011) selected five indicators to construct the stress index (EM-FSI) for 25 emerging market countries and used a two-stage model to verify the financial pressures linkage

and spillover effects between in emerging market countries and developed countries. This method has been affirmed and adopted by IMF. Hakkio and Keeton (2009) chose 11 indicators to construct the Kansas City Stress Index (KCFSI), and selected more characteristic variables to measure the financial stress in U.S. cities. Subsequently, a large number of foreign literatures widely used the IMF (2008) measurement of financial stress indicators (short for AE-FSI) for developed countries and Balakrishnan (2011) measurement of financial stress indicators (short for EM-FSI) in emerging market countries.

In recent years, Chinese scholars have carried out research on financial stress analysis, most of them are the analysis of single financial market risk and stress testing, and the literature on the overall financial market stress measurement is relatively scarce. Juan Lai and Linjiang Lv (2010) selected four indicators of the four major markets of banks, foreign exchange, bonds and stocks to make preliminary estimates of the financial market pressures and were widely cite by scholars. However, in my opinion, the indicators chosen for the article and the widely used indicator system is quite different. Financial stress index were constructed by Xiaosing Liu and Lei Fang (2012), Shoudong Chen and Yan Wang (2011) and Guihuan Zheng (2014) by selecting from 7 to 10 indicators. In addition to the four major financial markets, they added the changes in insurance claims to measure financial stress in the insurance market. Dilong Xu and Shuanglian Chen (2015) based on the CRITIC weighting Law to build the financial stress index, add the real estate market to the new financial stress index. The literature places more emphasis on the impact of other markets on the risk of China's financial system rather than on financial markets itself, such as adding the real estate market and the insurance market.

4. Data

4.1 Data Description and Statistics for Chinese Stock Market

Data was collected from the CSI 300 beginning on April 8th, 2005 since it was not available prior to this date. Collection continued through October 10th, 2017 showing stock returns and volatility in the Chinese market The S&P 500 index and MSCI index are used to measure the US and Europe markets respectively. The data used are all from Thomson Reuters DataStream. Figure 1 shows the three markets' stock indices in the sample period.
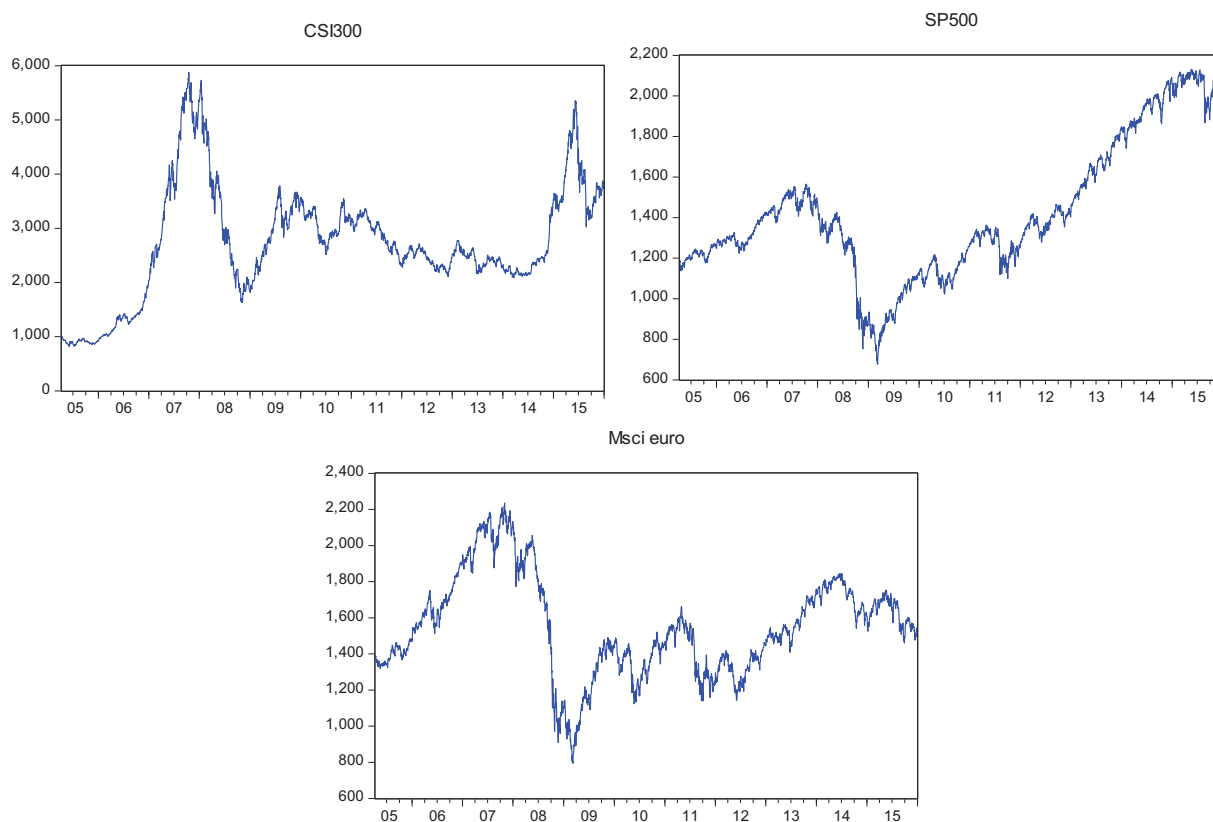
Figure 6. Three stock indices in the whole sample period

Daily closing prices are used to compute the stock returns. The stock returns can be denoted by $r_t = (\log(p_t) - \log(p_{t-1})) \times 100$, where p_t is the stock index's closing price. Table 1 displays the summary statistics of indices for the stock daily returns in China, US and Europe. Calculations include the mean, median, maximum, minimum,

standard deviation, skewness, and kurtosis of the stock returns over the whole sample period.

Table 1. The statistics of indices daily return

The statistics of indices daily return			
	CHINA	US	EURO
Observations	3262	3262	3262
Mean	0.018039	0.010249	0.003292
Median	0.004686	0.015151	0.011179
Maximum	3.87863	4.75865	4.646108
Minimum	-4.21056	-4.11256	-4.42036
Std. Dev.	0.755799	0.515763	0.615778
Skewness	-0.55132	-0.35605	-0.17104
Kurtosis	7.138536	15.25225	10.96824

4.2 Data for Chinese Financial Stress Index

The core of the index system in this paper is the IMF Emerging Market stress Index System. The carefully chosen indicators for this paper are the rolling beta coefficient in the banking sector, the banking Ted spread, the term spread, the stock return, the volatility in the time-varying stock index, the sovereign bond spread, the devalued variables in currencies, and foreign exchange reserves.

Constructing the FSI using selected monthly data can reflect the financial market stress in time. This article selects monthly data from January 1997 to December 2016. The main data sources for this article are: Datastream, Resset, Wind, and CSMAR. In addition, the rolling β coefficient and the time-varying stock index volatility (h_t) in the banking sector are respectively estimated by the author's establishment of the CAPM model and the GARCH (1,1) model.

5. Methodology

5.1 The DCC-GARCH Model for Three International Stock Markets

Engle(2002) put forward the dynamic conditional correlation multivariate GARCH model, the conditional covariance matrix is decomposed into the conditional variance ($h_{ii,t}$ and $h_{jj,t}$) and conditional correlation coefficient $\rho_{ij,t}$. The estimation process is divided into two steps: the first stage uses the original data and estimates a single variable GARCH equation for each sequence. The second step uses the first step's results to estimate the conditional variance of the dynamic correlation coefficient and the dynamic structure of H_t. In this paper, the DCC-GJR-GARCH model between three markets is as follows:

$$\text{First stage：} r_{i,t} = c_i + \varepsilon_{i,t} \quad i = 1,2,3, \tag{10}$$
$$h_{ii,t} = \omega_i + \alpha_i \varepsilon_{i,t-1}^2 + \beta_i h_{ii,t-1} \quad i = 1,2,3, \tag{11}$$

Second stage ： estimation of the dynamic structure of H_t,

$$H_t = D_t Q_t D_t = \left\{ \rho_{ij,t} \sqrt{h_{ii,t} h_{jj,t}} \right\} \tag{12}$$
$$Q_t = (1 - \theta_1 - \theta_2)\bar{Q} + \theta_1 u_{t-1} u'_{t-1} + \theta_2 Q_{t-1} \tag{13}$$

Where $u_{i,t} = \varepsilon_{i,t}/\sqrt{h_{ii,t}}$ is the residual after standardization, $Q_t = \{q_{ij,t}\}$ is the conditional covariance matrix of u_t. $\bar{Q} = E[u_t u'_t]$ is the unconditional variance matrix. $\rho_{ij,t} = \frac{q_{ij,t}}{\sqrt{q_{ii,t} q_{jj,t}}}$, $\theta_1 \geq 0$, ,$\theta_2 \geq 0$, and $\theta_1 + \theta_2 < 1$,

i represents the three major financial markets (i=1,China; i=2, America; i=3, Europe).

5.2 The Construction of Chinese Financial Stress Index

Scientific measurement of financial market risk, the choice of indicators of the system is very important. The core of the index system in this paper is the IMF Emerging Market stress Index System. We have made some specific calculations on the absence of important data on China financial markets, such as the rolling beta coefficient in the banking sector. For some selected indicators of the original data, we also make reference to the IMF's developed countries' stress index system and the financial stress index system released by other major banks, such as the St Louis Federal Financial Stress Index, with corresponding adjustments and additions. The carefully chosen indicators for this paper are the rolling beta coefficient in the banking sector, the banking Ted spread, the term spread, the stock return, the volatility in the time-varying stock index, the sovereign bond spread, the devalued variables in currencies, and foreign exchange reserves 8 Indicators, as described below.

Table 2. Construction of Chinese Financial Stress Index

Markets stress	Indicators	Calculation	Correlation
Banking stress	Banking β^*	$\beta^* = \max\{\beta - 1, 0\}$, B is banking sector rolling β coefficient.	Positive
	BankingTed spread	The 3-month interbank offered rate minus the risk-free rate	Positive
	Term spread	The difference between long-term government bond yields (10 years) and short-term government bond yields (3 months)	Negative
Security market stress	Stock return	The monthly stock returns of the Shanghai Composite Index	Negative
	Stockindex return volatilityH_t	The stock index GARCH (1,1) model to measure the dynamic volatility	Positive
	Sovereign bondspread	the difference between the yield on China's 10-year bond and the yield on the United States 10-year bond	Positive
Exchange market stress	Currency devaluation	The monthly exchange rate change	Positive
	Foreign exchange reserves	The monthly total national reserves minus the change in the amount of gold reserves	Negative

The weight of FSI construction in this paper is based on the IMF construction method ---- equal weighted method. This method assumes that the variablesx_i follow a normal distribution after subtracting the mean$\overline{x_i}$, dividing by the standard deviation σ_{x_i}, taking the normalized variables by the same weight, and adding the subject variables below to represent the normalization of the corresponding variables. The total Financial Stress Index formulas are presented as follows:

$$FSI = \sum_{i=1}^{n} \frac{x_i - \overline{x_i}}{\sigma_{x_i}} \qquad n=8$$

From January 1997 to December 2016 , the Chinese FSI constructed in this paper is shown below:
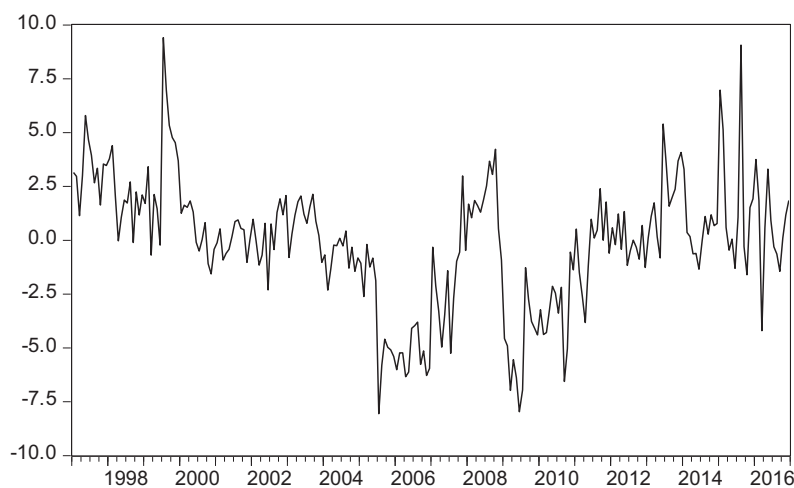
Figure 7. Chinese Financial Stress Index construction

6. Empirical Results of Spillover Effect and Risk Transmission

6.1 The Spillover Effect of Chinese Stock Market

Unexpected external events such as a financial crisis lead to stock market risk changes .At the same time, the change of the stock return's volatility induced by these events impact different financial markets, thus causing a spillover effect. When the financial risk increases suddenly, the cross market's financial risk contagion effect may occur among different financial markets. More importantly, because of intermarket correlation, the contagion effect varies among the different countries. Compared with the low correlation international stock markets, the high correlation stock markets' risk will be infected faster among each other, but low correlation stock markets' risk will be infected slower or not at all. In this paper, using DCC-GJR-GARCH model to explore the relationship among China, US and Europe, the.Chinese stock market is our main research focus. Initially, calculations of the stock markets' return were analyzed and then the multivariate GARCH model was used to verify the volatility spillover effect and dynamic conditional correlation among China and the other two major

stock markets. A significant dynamic conditional correlation was found between China and the others markets.

Former researchers' work has proved that dynamic correlation coefficients of DCC-GARCH model can generally describe the correlation level of multiple markets across the world. Empirical results show a significant correlation between Chinese, European and American markets （$\theta_1 = 0.004$ a$\theta_2 = 0.992$， $\theta_1 + \theta_2 < 1$, z-statistics are 2.32 and 214.9), proving a significant markets co-movement among these countries. This means when financial markets in one country have a sudden change, financial markets in other countries may be affected.

Additionally, markets co-movement also means infection among financial markets in different countries depend on their correlations. Different correlations can lead to various propagation speed and infectivity. In high correlation periods, market changes are more synchronized, with stronger interactivities, and high risk infection levels. In low correlation periods, market changes are less synchronized, with weaker interactivities, and lower risk infection levels. In other words, different correlations among markets can lead to different risk contagion results.

The results of this study also prove that the Chinese stock market had higher dynamic market co-movement than other international financial markets after 2008 financial crisis. When China entered to the "New Normal Period" in 2014, its interrmarket co-movement became lower suddenly, but then it rebounded again. What's more, the empirical research shows that China has higher correlation with Europe than the US. As a result, I consider that stock volatilities in international markets can affect Chinese financial risk significantly.
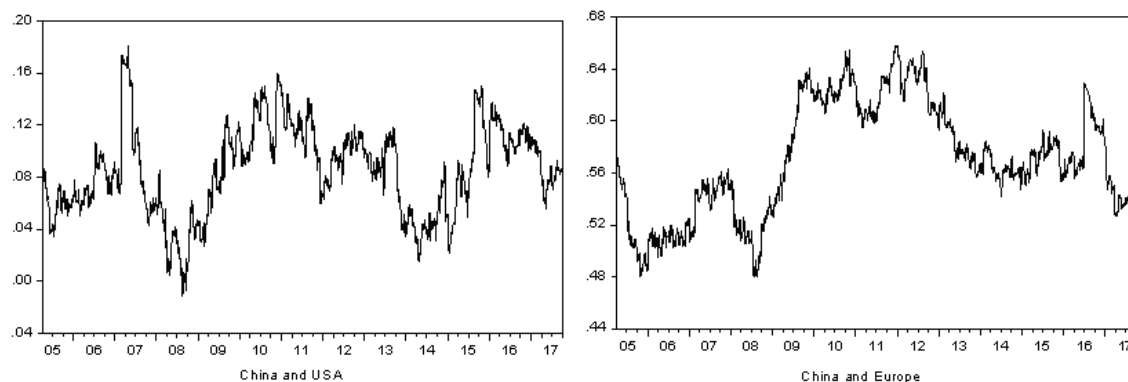
Figure 8. Stock markets dynamic correlation among China, US and Europe

7. The Transmission of Risk in China-US Financial Markets

Since China economic development gradually entered a "New Normal Period" from 2013, the banking industry, stock market and foreign exchange market have all shown the characteristics of a high financial risk state. Therefore, it is even more urgent to guard against the higher possibility of a new financial crisis for China. The Chinese government can't ignore financial market risk any more.In this paper, I build an index, called the Financial Stress Index (FSI), to calculate Chinese financial market risk. The FSI index constructed in this paper is forward-looking with real-time high-frequency data for the market. It covers the financial markets such as the stock market, bond market, foreign exchange market, and banking institutions. This index can measure the changes in the financial market risk in China..

As global economic integration continues to deepen, the financial market risk of various countries may have international contagion effect. As a center of the global economy, there may be a large spillover effect in the US financial market risk. This article uses the Financial Stress Index of the two countries (China and US), and constructs a VAR model to analyze whether there was a risk transmission mechanism between them. The following chart shows the financial stress index from January 1997 to December 2016 issued by the US St. Louis Fed.
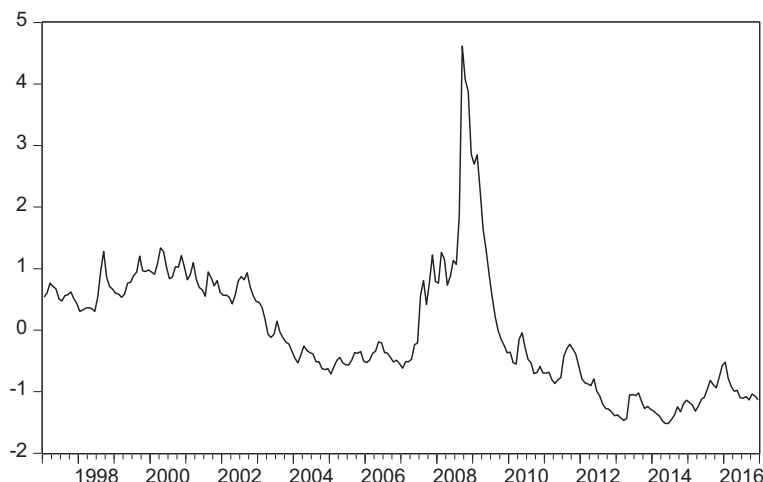
Figure 9. St. Louis Fed Financial Stress Index of US

Note. FSI data from https://fred.stlouisfed.org/series/STLFSI

This paper makes a Granger causal analysis of financial stress between the two countries and the results are shown in Table 3. The results show that the United States is China's Granger cause, but China is not the United States Granger cause. Figure 10 shows the results of the impulse response function. It can be seen that the US financial stress index is impacted by one unit of standard deviation, and China's financial stress index will have a larger increase. However, after the change in China's financial stress index, the US financial stress index has no obvious trend of change. From this we can see that the US financial market risk still has a stronger spillover effect on China.

Table 3. Granger Causality Analysis of Financial Market Risk in China and the US

Null Hypothesis:	F-Statistic	Prob
USFSI does not Granger Cause CFSI	3.80106	0.0237
CFSI does not Granger Cause USFSI	1.19284	0.3052
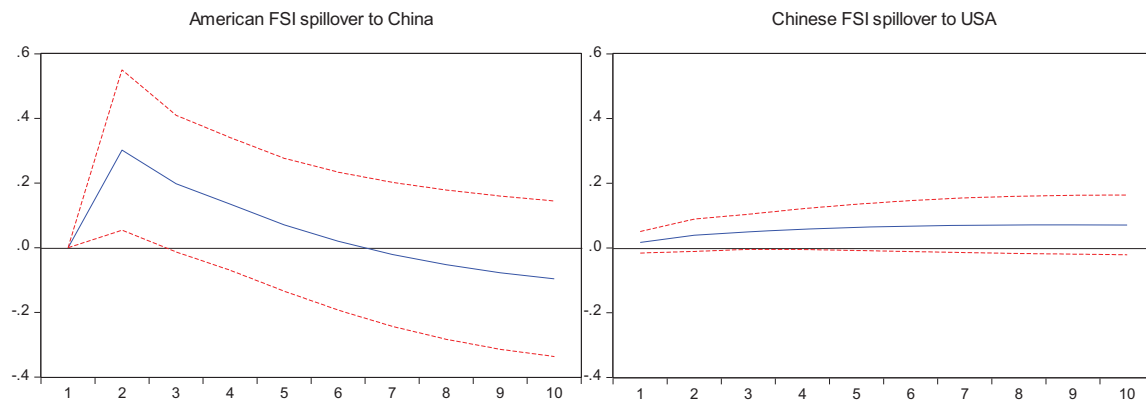
Figure 10. Impulse Response Function of financial market risk in China and US

8. Conclusions and Policy Suggestions

First, the stock market in China can be affected by outside economic factors leading to sudden changes in the return rate of the stock market and increases in financial risk. Second, financial risk is able to spread across markets and impact financial assets prices in other countries, which will cause risk spillover effects. In extreme cases, it will lead to assets price fluctuations in the short term. Third, when financial markets are caught in turbulent periods, multiple country correlations may enhance the turbulence, and lead to systematic risk increases in a wider range, even causing global economic crises. Finally, US financial market risk has a strong spillover effect on China. US financial market risk has strong Granger cause on Chinese financial risk , but China does not impact US financial market risk similarly..

Based on these conclusions, the following Chinese policy proposals are suggested:

- Realize the importance of systematic financial risk, a complete macro–prudence mechanism , and a stable financial market.
- Understand the relationship between international financial market risk and accumulation of systematic risk.
- Establish a pre-warning system for the possibility of crises.
- Pay more attention to the openness of the Chinese market and a higher correlation with other markets, limiting risk spillover.

Acknowledgement

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The Effects on Financial Leverage and Performance: The IFRS 16

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Abstract

This paper analyses the potential impacts of the introduction of a new accounting standard, International Financial Reporting Standard 16 (IFRS 16) – *Leases,* on financial leverage and performance of entities. This new accounting standard was introduced on 13 January 2016, and will become effective on 1 January 2019; it will have material impacts on the financial statements of listed companies adopting IFRS and change the basic principles of the current accounting system. Our aim is to estimate the impacts of the application of IFRS 16 on listed issuers of financial statements and the different impacts that the new standard could have in different activity sectors. This research estimates the effects of IFRS 16 on the ratios of debt/total assets, EBITDA/revenues and debt/equity. The conclusions summarize the effects on entity performance and net financial position. The research shows that in the financial statements of the lessee, there will be important changes. In particular, in the balance sheet, there will be an increase in lease assets, an increase in financial liabilities and a decrease in equity, while in the income statement, there will be an increase in EBITDA and an increase in finance costs. The impact of the application of IFRS 16 will be different depending on the use of operating lease contracts among the different business sectors. Leases are an important and flexible source of financing; listed companies, using IFRS and U.S. GAAP, are estimated to have around US$ 3.3 trillion in lease commitments. Finally, this study aims to analyse the possible impacts of communication of entities, focusing on alternative performance measures.

Keywords: alternative performance measures, IFRS 16, financial leverage, lease, non-GAAP measures, performance

1. Introduction

Businesses today have an increasing need to share their financial information; in order to provide clearer and more transparent information and to facilitate the comparison of information with others, companies must adopt the same rules. One of the most important points that increase the effectiveness of financial communication is, in fact, "compliance with all regulatory requirements".

To obtain greater effectiveness of financial communication, the application of an "accounting regulation" is important; Meeks and Meeks (2001), in this regards, use the term "accounting regulation" to refer to financial accounting standard-setting, auditing/assurance and enforcement and refer to the overall system of regulation, as well as, in some of their discussions, to specific standards.

After the US securities acts of 1933/34, Watts and Zimmerman (1986) said that "accounting theorists became more concerned with policy recommendations, they become more normative, so concerned with what should be done, with prescribing how firms should report". In Europe, the rules for financial communication are entrusted to the European Union, which has decided to adopt international accounting standards for the preparation of financial statements. To increase the comparability of the financial information of different companies (in perhaps different countries), the European Union enacted Regulation (EC) No. 1606/2002 of the European Parliament, which requires listed companies to apply the international accounting standards or IAS/IFRS (International Accounting Standards/International Financial Reporting Standards)[1]. In April 2001, the International Accounting Standards Board ("IASB") created the IAS/IFRS. There are IFRS on various financial

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[1]In Europe and Australia, consolidated financial statements prepared under IFRS have been mandatory for listed companies since January 2005. In other countries, i.e., Germany, listed companies have been permitted to adopt IFRS even before they become mandatory (Brown, 2011)

statement items, including rewriting previous IAS and the implementation of new ones.

On 13 January 2016, the IASB issued a new accounting standard IFRS 16 - *Leases*, which will become effective 1 January 2019. The introduction of this new accounting standard will have material impacts on the financial statements of listed companies and on those adopting IFRS, changing basic principles of the current accounting system. A lease is a contract, where one party (lessor) allows another (lessee) the right to use an asset for a given period through the payment of a consideration. Even if not explicitly referred to as a lease contract, contracts related to rent, hire and tenancy also meet the definition of "lease contracts".

IFRS 16 provides a new definition of a lease and introduces a control-based criterion for assets ("right of use") to distinguish a lease from a service contract. However, the current standard (IAS 17 *Leases*) distinguishes lease contracts as operating and finance leases. Currently, lessees usually account for operating leases on an accrual basis (the cost shown in the financial statement is usually equal to the fee paid for the year), similar to the accounting for rents/hires (and services in general), without the recognition of a liability for future payments (lessees should disclose future payment commitments in the notes to the financial statements). However, the accounting for finance leases involves the recognition of an asset in the statement of financial position and the recognition of a liability for future lease payments.

The current accounting standard governing lease agreements, therefore, does not require the recognition of liabilities arising from operating leases in the financial statements. Conversely, IFRS 16 will require the recognition of lease liabilities for payments to be paid to the lessor in the net financial position, which will have a significant impact on capital and financial strength indicators such as key performance indicators ("KPIs") and covenants. The standard setters (i.e., IASB, the most important board for the accounting standards around world and FASB- Financial Accounting Standards Board, the most important board for the accounting standards in the United States, which have been working together on this project for over 10 years) have developed a new accounting model applicable to lessees/tenants, with the goal of recognizing assets and liabilities for rights and obligations arising from lease contracts (with some limited exceptions) regardless of their nature. Undoubtedly, the goal of the new accounting model is to overcome the alleged lack of transparency of the current accounting model, to avoid or reduce structured contracts (structured with the sole purpose of achieving a certain accounting effect) and, ultimately, to improve the comparability of financial statements. For example, consider the case of two airlines, where one owns the aircrafts as property, while the other leases the aircraft under an operating lease. Currently, the assets and liabilities of these two airlines are not comparable, while they will be comparable following the adoption of the new accounting standard, IFRS 16.

At this point, we must provide some perspective about the magnitude of the issue that is the subject of our discussion. In this regard, in 2005, the *U.S. Securities and Exchange Commission* ("SEC") estimated operating lease commitments not recognized in US financial statements to be approximately US$ 1.25 trillion, highlighting how companies facing financial troubles have significantly used lease contracts as a source of funding. Similarly, in 2015, the IASB conducted a survey on the potential impact of the new accounting standard on the financial statements of 30,000 listed companies, where approximately 14,000 reported information related to unrecognized operating lease commitments totalling $ 2.86 trillion. The materiality of their impacts is therefore evident.

The *European Financial Reporting Advisory Group* ("EFRAG") has the task of promoting European interests, especially in the standard-setting activity carried out by the IASB. The European Commission asked the EFRAG to provide its opinion about the EU endorsement of the new IFRS 16. To express its opinion, the EFRAG commissioned an independent company to perform a study, "*Ex ante impact assessment of IFRS 16*", which estimated that the introduction of IFRS 16 will increase the liabilities of European listed companies (the banking sector was excluded from this analysis) by approximately 576 billion Euro based on lease information provided in the 2015 financial statements for such companies. Although all entities will be affected by the new standard, those in the airline, retail and travel & leisure sectors will be the most affected. On 27 March 2017, EFRAG issued a favourable opinion on the endorsement of IFRS 16. In particular, the EFRAG concluded that "[…] *IFRS 16 meets the qualitative characteristics of relevance, reliability, comparability and understandability required to support economic decisions and the assessment of stewardship, leads to prudent accounting, and that is not contrary to the true and fair view principle* […]". The EFRAG has recommended the endorsement of IFRS 16 by the European Commission. At the date of this document, endorsement is expected during the fourth quarter of 2017.

Although, as previously mentioned, IFRS 16 will be mandatory from 1 January 2019, it is evident that it is undoubtedly in the interest of the entities to assess the potential impacts of the new standard and to define any

operational changes that may be required (i.e., lease or buy) involving the appropriate business functions: purchasing, general services, information systems, treasury and legal and corporate affairs.

To provide insights on the potential impacts expected from the introduction of IFRS 16 on the financial statements of Italian issuers, we conducted an empirical study using the disclosures on operating lease commitments reported in the 2016 financial statements of the 384 entities listed on the Italian Stock Exchange. This study is purely indicative, and its scope is limited by the fact that not all the companies provided the disclosures required by IAS 17 on future payment commitments. Similarly, when such disclosures were provided in the financial statements, they may be underestimated (e.g., in a 6 + 6-years lease, the current disclosure on commitments includes future lease payments for only the first contractual period, while IFRS 16 requires a more complete evaluation of the contractual term, which might result in a 6 or 12-year lease term). However, despite the aforementioned limits on the completeness of the underlying source of the study, it is worthy of interest for the size of the increased indebtedness that will presumably be shown in future financial statements.

Moreover, we conducted the same empirical study using the disclosures on commitments for operating leases reported in the financial statements as of 31 December 2015, by listed entities on the Italian Stock Exchange. In the 2016 financial statements, we noted both a higher number of issuers providing disclosures on operating lease commitments (from 102 in 2015 to 113 in 2016) and higher amounts disclosed as future undiscounted lease payments (from Euro 171.4 billion in 2015 to Euro 173.6 billion in 2016). Therefore, it is evident that the approaching date of IFRS 16's first application is generating greater awareness and, consequently, more attention to the completeness of the disclosures on issuers' operating leases.

The paper is organized as follows. After the introduction, the first part provides an analysis of theoretical framework, literature review, explanation of the new IFRS 16 and alternative performance measures ("APMs"). The second part covers the methodology, sample and source data, followed by the analysis of the impacts of the application of IFRS 16 on listed issuers financial statements. Finally, we perform some considerations on impacts in connections with the main entities communication tools (i.e., KPIs, APMs) and possible impacts on company transactions.

2. Theoretical Framework and Literature Review

Financial communication provided by a company discloses full, timely and relevant information about its financial situation and is an important factor in reducing the cost of capital. Furthermore, it is an important link between the company and its stakeholders, especially investors, and it plays an important role in informing investors, consumers and shareholders about its financial state (Wang, 2013).

2.1 Theoretical Framework

The reasons companies want to apply accounting standards depend primarily on the benefits that managers and shareholders can derive from doing so. Several scholars, including Watts and Zimmerman, have studied a theory (Positive Accounting Theory) that is useful in explaining the use of accounting standards (Watts and Zimmerman, 1978, 1979, 1986).

Owing to these two scholars, positive accounting has become an academic accounting theory that helps explain and predict actual practices in accounting. In the Positive Accounting Theory, Watts and Zimmerman claim that "management plays a central role in the determination of standards" and "one function of financial reporting is to constrain management to act in the shareholders' interest". (Watts & Zimmerman, 1978:113). These two considerations underline how the importance of adopting new and good accounting standards, especially for large companies (as suggested by Watts and Zimmerman), also helps solve classic problems due to the agency theory[2], i.e., problems related to the difference in interests between shareholders and managers. As Brown states, "Accounting standards are important in a well-developed capital market because they help resolve a serious agency problem. Insiders (managers) are better informed than outsiders (shareholders) about their firm's investment opportunities, how hard they, the managers, will work and the perks they will consume and how well the firm is doing overall. Uniform accounting and auditing standards will be found because they are a relatively low-cost solution to a serious agency problem" (Brown, 2011:270).

Therefore, support for clear and transparent information within the financial statements allows the interests of

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[2]The agency theory is a theory that explains the relationship between principals and agents in business. The problems that can exist in agency relationships are related to the different and varying interests of the principal and agent when the principal is unable to verify what the agent is actually doing. Agency theory is also concerned with different attitudes towards risk held by the principal and agent (Jensen and Meckling, 1976).

managers to be brought closer to those of shareholders.

The creation of new accounting standards should, therefore, take into account all of these aspects and seek to focus not just on some fundamental features such as:

- higher quality of information (more accurate, comprehensive and timely financial statement information);

- minor difference in the knowledge of information between small investors and professionals (adverse selection);

- greater comparability, eliminating many international differences in accounting standards and standardizing reporting formats;

but primarily seek to increase the benefits for shareholders and obviously for managers (Ball, 2006, Brown, 2011).

Furthermore, higher-quality information, according to Ball, "should reduce both the risk to all investors from owning shares and the risk to less-informed investors due to adverse selection. In theory, it should lead to a reduction in firms' costs of equity capital" (Ball, 2006:11).

Taking into account all of these considerations, it is clear that those who create the accounting standards (i.e., IASB or FASB) are subjected to the pressure of the management and the shareholders of the main large companies that have the goal of maximizing their interests (Watts & Zimmerman, 1978:112). To meet these needs and increase financial communication, the standard setters decided to introduce a new standard, also in the context of leasing, i.e., the IFRS 16. The reasons for the new IFRS on leases are as follows:

- operating leases are not recognized in the balance sheets of lessees, which affects the comparability of the financial statements of companies operating in the same sector, especially between those that purchase the assets owned and those that use leasing;

- 85% of leasing contracts are not included in the company balance sheet;

- more than USD 2,000 million will be able to "emerge" in the balance sheets (survey conducted by IASB and FASB in 2012);

- financial statements of entities are not comparable;

- standard setters have noted that the entities with financing problems use operating leases extensively to finance their activities and the increase in debt is not reflected in their financial statements. In particular, standard setters conducted a specific study on the financial statements of entities that had fallen into bankruptcy and noted that in the years before the bankruptcy, they increased the use of operating leases significantly, which gave them the opportunity to hide real indebtedness (FASB and IASB analyses).

2.2 Literature Review

Accounting for leases is one of the convergence projects for IASB[3] and FASB[4]. "*The objective of the lease project is to develop a standard that establishes the principles that lessees and lessors shall apply to report useful information to users of financial statements about the amount, timing and uncertainty of cash flows arising from a lease. To meet that objective, an entity shall recognize all assets and liabilities arising from a lease*"[5] (IASB, 2013).

FASB took up accounting for leases as one of its first priorities and devoted a number of staff to lease accounting issues (Monson, 2001:275). For years, users of financial statements, academics and regulators have criticized leasing accounting principles as unnecessarily complex and ineffective in the way they portrayed liabilities arising from leasing contracts in the balance sheet of lessee companies (Monson, 2001).

Many scholars have studied leases (Barone *et al*., 2014); while some of them have focused on the effect on stock market prices (Ro, 1978, Bowman, 1980), most of them have focused on the analysis of the impact of

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[3]IASB is the body responsible for issuing international accounting standards around the world.

[4]Established in 1973, the Financial Accounting Standards Board (FASB) is an independent, private sector, not-for-profit organization based in Norwalk, Connecticut that establishes financial accounting and reporting standards for public and private companies and not-for-profit organizations that follow Generally Accepted Accounting Principles (GAAP)

[5]IASB, (2013) Leases: http://www.ifrs.org/Current-Projects/IASB-Projects/Leases/Pages/Leases.aspx

capitalization of operating leasing on key financial ratios (Ashton, 1985, Imhoff, Lipe, & Wright 1991, Beattie V. *et al*., 1998, Goodacre, 2003, Durocher, 2008, Jesswein, 2009, Grossman & Grossman 2010, Singh, 2010, Fitò, Morgan & Orgaz, 2013, Nuriani, Hengb, & Jeliesta, 2015).

In the most recent study in 2008, Durocher developed and used a refined constructive capitalization method in which company-specific assumptions—interest rate, total, expired, remaining lives of leased assets and tax rate—were used to compute the impact of operating lease capitalization on key financial indicators for a sample of Canadian public companies. The results of this study indicated that capitalizing operating leases could increase the debt-to-asset ratio and decrease the current ratio significantly. These results were noted across all industry segments in the sample, whereas significant impacts on return on assets, return on equity and/or earnings per share were noted in only three industry segments: merchandising and lodging, oil and gas, and financial services (Durocher, 2008). Another study in 2008 in Germany (Fulbier, Pferdehirt, & Silva, 2008) analysed the impact of operating lease capitalization for a sample of 90 companies belonging to the three major indices (DAX 30, MDAX and SDAX) for the years 2003 and 2004. The results show a considerable impact on companies, especially those in the fashion and retail industry.

The same study was undertaken by Jesswein in 2009. In an analysis of 595 U.S. companies, Jesswein detected the impact of the capitalization of operating leasing on key financial ratios, particularly on the current ratio, quick ratio, Altman ratio, interest coverage, EBITDA coverage, debt ratio and return on invested capital (those used to assess the credit standing of companies). The results indicate that nearly one-quarter of the companies that were considered relatively free of credit risk would not be considered this way if their operating leases were taken into account (Jesswein, 2009:83).

Another study (Grossman & Grossman, 2010) took a sample of 91 nonfinancial companies from the top 200 of the Fortune 500 that had issued 2009 10-K reports to analyse the effect of including total operating lease payments on the current ratio and the ratio of total liabilities to total assets. The results show that in many companies of the sample, the current ratio and the ratio of total liabilities to total assets have worsened. This means that some companies are in violation of debt covenants, which require strict debt ratio (Grossman & Grossman, 2010:11).

In 2010, Singh analysed the expected impact for a sample of 234 firms, including 64 restaurants and 170 retail firms, for the period 2006 – 2008. He found significant relative and absolute differences across and within the two industries in relation to financial ratios related to leverage, profitability and interest coverage (Singh, 2010).

In 2015, Nuryani aimed to examine determinants of operating lease policies (financial constraint, asset value, growth and firm size) and the impact of constructive capitalization of operating leases towards a company's financial ratios. The finding shows that all determinants except financial constraints influence operating lease policies, although most operating leases are explained by factors other than economic determinants (Nuryani, *et al.,* 2015).

2.3 IFRS 16 Leases

As mentioned previously, IFRS 16 is the result of a joint project initiated by the IASB together with the U.S. national standard setter, the FASB, to address concerns raised by users of financial statements with respect to reduced comparability between financial statements due to the very different accounting applied to operating and finance leases and limitations in the information provided on operating leases and on entities' exposure to risks arising from lease arrangements.

To address those concerns, the two boards decided to develop a new approach to lessee accounting that requires a lessee to recognize assets and liabilities for the rights and obligations created by leases (with some limited exceptions) and to enhance the required disclosures on leases.

IFRS 16 applies to all leases, including leases of right of use assets in a sublease, with the exception of specific items covered by other standards:

- leases to explore for or use minerals, oil, natural gas and similar non-regenerative resources;
- contracts within the scope of IFRIC 12 Service Concession Arrangements;
- for lessors, licenses of intellectual property within the scope of IFRS 15 Revenue from Contracts with customers;
- for lessees, leases of biological assets within the scope of IAS 41 Agriculture and rights held under licensing agreements within the scope of IAS 38 Intangible Assets for items such as motion picture films, video recordings, plays, manuscripts, patents and copyrights.

In response to concerns raised over the cost of applying the requirements of the new standard, the IASB decided to provide some relief for prepares by allowing short-term leases and leases of low-value assets to be accounted for by recognizing an expense, typically straight-line, over the lease term.

IFRS 16 aims to distinguish a lease from a service contract based on whether a customer is able to control the asset being leased. A contract is, or contains, a lease if the contract provides a customer with the right to control the use of the identified asset for a period of time in exchange for consideration. Control is considered to exist if the customer has i) the right to obtain substantially all of the economic benefits from the use of an identified assets or ii) the right to direct the use of that asset. At the beginning of the contract, the lessee recognizes both the right of use of the asset and the lease liability on the balance sheet. The date of the initial lease recognition is defined as the date on which the lessor makes the leased asset available to the lessee (defined as the *commencement date*).

In measuring the right of use of the asset, the lessee is required to include the cost of such a right:

- the amount of the future liability measured in accordance with the lease agreement at the commencement date;

- any rental fees paid to the lessor at or before the commencement date, net of any possible incentives received from the lessor;

- possible initial direct costs incurred by the lessee;

- an estimate of the costs to be borne by the lessee in the event of dismantling and/or removal of the leased asset, restoring the site on which the asset is located or restoring the leased asset under the terms and conditions of the contract.

Subsequently, an entity will assess the right of use by means of the cost model or the revaluation model provided for by IAS 16, or, if the leased asset is a real estate investment, by the fair value model provided by IAS 40.

Corresponding to the right of use recognized as an asset in the financial statements, there will be a financial liability. An entity must recognize a lease liability for the present value of future discounted lease payments at the lease rate implied in the lease agreement, if determinable. In the event an entity is unable to estimate the interest rate implied in the contract, the rate used will be the incremental borrowing rate of the entity.

Special attention must be paid to the definition of the term of the lease contract and the future lease payments of the contract. When there are options for extensions and/or termination of the contract that are exercisable at the sole discretion of the lessee and are considered "reasonably certain", they should be considered in the measurement of the lease liability (in an ordinary lease for a shop of 6 years renewable for another 6 years at the sole discretion of the lessee, it will be necessary to evaluate whether the contract term is 6 or 12 years). Conversely, the lessors' financial statements will be subject to limited changes with the introduction of IFRS 16.

2.4 Alternative Performance Measures

In the international arena, there have been many discussions on metrics for measuring the performance of entities and how the entities show and calculate Alternative Performance Measures - APMs (e.g., EBITDA, adjusted EBITDA, EBIT, adjusted EBIT, and net financial position).

In 2005, the first recommendations on APMs[6] (or non-GAAP measures) were made. Since then, several updates on accounting principles and professional standards have been provided; today, the regulatory agencies have realized the importance of updating APM regulations. In 2015, the European Securities and Markets Authority (ESMA) issued new guidelines (NGL) regarding APMs. The reason was that financial statements reflected data and other information according to applicable accounting standards, although entities use APMs not required by accounting principles to communicate financial information and results (Magli, Nobolo, & Ogliari, 2017).

What are the most important APMs that include leases and therefore could benefit from their re-evaluation thanks to IFRS 16?

- **EBITDAR**: This measure is defined as the total adjusted EBITDA plus rental expenses. This is an APM indicator commonly used by management to evaluate the financial performance and resource allocation for operating units within a company. These tools serve as measures of leverage capacity and debt serviceability. This APM is the relevant one to calculate a leverage ratio once capitalized operating

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[6]An APM is a financial measure of either historical or future financial performance, financial position or cash flow other than the items specified in the valid financial reporting framework.

leases are added to financial debt. It is also useful for conducting cross-company comparisons when different capital structures are in place.

- *Total Adjusted Financial Debt:* This measure is the total net financial debt plus capitalized rental expenses at a 4.0x multiple, as per Moody's Investor Services methodology. This APM is used as a metric to assess a company's financial liabilities considering operating leases as debt, which is expected to be the case once IFRS 16 is implemented in 2019.

- *Total Adjusted Net Financial Debt*: This measure is the total adjusted financial debt, as defined above, minus cash and cash equivalents. This indicator is used to assess a company's financial liabilities, including operating leases and taking into account available cash.

IFRS 16 affects the operating results, financial results, financial debts and timing of charging costs in the income statement. In addition, in the presence of operating leases, it is a market practice to adjust the debt of companies during merger and acquisition transactions or when the rating agencies determine the rating of entities. IFRS 16 introduces one of the most important changes in the metrics of financial statements in that entities will have to re-think their APMs, and other stakeholders will have to adjust their models to evaluate the value and performance of entities.

3. Methodology

The method used in the study is both qualitative and quantitative as follows:

- the subject of the analysis is a new accounting standard (IFRS 16 will be effective 1 January 2019);

- it is necessary to study the potential impacts on previously approved financial statements to increase awareness of the entities on the possible range of impacts expected with the introduction of the new standard;

- it is not possible to quantify the potential effects coming from the application of the new standard without the assurance on the completeness of disclosures on future operating lease payments provided by issuers in accordance with IAS 17.

This study aims to provide preliminary insights about the magnitude of the potential impacts of IFRS 16 on the various business sectors of Italian issuers; in particular, the study analyses and estimates the following aspects:

- amount of rights of use on total assets recognized in the financial statements;

- information that will be available to users of financial statements to perform a prospective cash flow analysis;

- impacts on capital position and the financial condition of the entity;

- impacts on profitability and performance metrics of the entity;

- effects on the quality of financial information and the comparability of financial statements.

3.1 Sample and Source of Data

We developed a property database composed of secondary data and consistent with the purpose of our study. We decided to gather quantitative data from annual reports, an approach that is both objective, being based on official information, and practical, as it would have been difficult to use questionnaires to gather an extensive amount of precise information from a large sample of firms.

The information used in the study was obtained from the financial statements published by entities listed in Italy (in the case of groups, the consolidated financial statement was used). We analysed the financial statements of 384 issuers and identified 113 issuers that disclose information on future committed payments. We prepared a checklist and then we analysed the financial statements of issuers. First, we identified the issuers that have operating leases. Second, we focused on issuers that use operating lease and we did an in-depth analysis of the use of operating leases. Finally, we estimated the effects of the application of IFRS 16. In particular, the quantitative data from annual reports that we use in our analysis are:

- future committed payments of operating leases in accordance with IAS 17;

- revenues;

- EBITDA;

- total assets;

- financial indebtedness;

- equity;
- annual operating lease payments.

In the course of the study, a check of the completeness and accuracy of the public information used was not performed.

3.2 Assumptions Used

The estimated potential effects arising from the adoption of IFRS 16 are purely indicative and have been made using certain various assumptions. As a result, their actual impacts upon adoption may be different, and the estimates are subject to certain limitations.

The information contained in the study should be read by taking the following into consideration:

- sector information is based on the classification proposed by the info providers;
- the analysis was performed using information provided in the entities' financial statements as of 31 December 2016;
- data were analysed in Euros;
- future discounted minimum leases payments were estimated using a discount rate of 5%;
- EBITDA is an APM and has been used without any verification of the calculation method;
- a significant number of entities remain excluded from the analysis due to the absence of disclosures on operating leases in the notes to the financial statements.

4. Impacts of the Application of IFRS 16 on Listed Issuers Financial Statements

This study aims to estimate the impacts arising from the introduction of IFRS 16 on the financial statements of Italian-listed issuers. In particular, the study analyses the following aspects on the basis of the statement of financial position as of 31 December 2016, and the information disclosed in the notes to the financial statements is as follows:

- the amount of the rights of use on total assets recognized in the financial statements;
- the information that will be available to the users of the financial statement to perform a prospective cash flow analysis;
- the impacts on profitability and the performance of entities;
- the impacts on the financial position of entities.

The population surveyed is represented by 384 issuers whose shares are traded on the markets managed by the Italian Stock Exchange. The estimate of the potential impacts on the financial statements from the adoption of IFRS 16 was based on an analysis of the notes to the financial statements for the year ending on 31 December 2016 of the issuers claiming to make use of operating leases. The study was performed using certain assumptions as detailed in paragraph 3.2. Table 1 shows the composition of entities providing disclosures on future lease payments in the notes to the financial statements.

Table 1. Percentage of entities with disclosures relating to operating leases in the notes to the financial statement

Euros 000,000,000	
FTSE AIM Italia	5%
FTSE ALL Share	77%
FTSE Italia Micro Cap	11%
FTSE Italia Mid Cap	33%
FTSE Italia Small Cap	12%
FTSE Italia Star	34%
FTSE MIB	60%
OTHER (*)	48%
Total future undiscounted lease payments	**Euro 173.6 billion**
Total future discounted minimum lease payments (estimated value)	**Euro 131.9 billion**

(*) listed entities on multiple stock segments

As mentioned, this study covered the 2016 financial statements of 384 issuers, of which only 113 reported disclosures on operating leases in the notes to the financial statements. This aspect might represent a limitation to the present study.

The total amount of future payments related to operating leases was estimated to be € 173.6 billion (undiscounted). The discounted value of these future payments was estimated to be € 131.9 billion (using a

conventional 5% discount rate), representing 76% of future undiscounted lease payments disclosed in the notes to the financial statements.

This study then focused on the disclosures reported in the 2016 financial statements of the aforementioned 113 entities. Table 2 shows the details of future discounted minimum lease payments segregated by the different markets managed by the Italian Stock Exchange.

Table 2. Future discounted minimum lease payments separated by market

Euros 000,000,000	
FTSE AIM Italia	0.23
FTSE ALL Share	30.17
FTSE Italia Micro Cap	0.03
FTSE Italia Mid Cap	2.74
FTSE Italia Small Cap	0.39
FTSE Italia STAR	0.84
FTSE MIB	28.42
OTHER (*)	69.10
Total future discounted minimum lease payments (estimated value)	**Euro 131.9 billion**

(*) *listed entities on multiple stock segments*

This study shows that commitments for future payments of operating leases disclosed in the notes to the financial statements and consequently the potential impacts of IFRS 16 can be very different depending on the business sector to which the entity belongs. The ratio between future minimum lease payments and total assets is considered an indicator of impacts that IFRS 16 will have on financial statements because the entities do not record the amount in the financial statements when using IAS 17, while they record the amounts of lease payments as financial liabilities in their financial statements when using IFRS 16. Thus, a high ratio is an indicator that IFRS 16 will have relevant effects on the main financial statements metrics. Table 3 shows a breakdown by business sector of the future minimum lease payments compared to the issuer's assets.

Table 3. Ratio between future minimum lease payments and total assets

Euros 000,000,000	N° of entities	Total assets	Future undiscounted payments for operating leases	Ratio between future lease payments and total assets	Future discounted lease payments	Ratio between future discounted lease payments and total assets
Aerospace, defence, airlines, and transport	7	363.7	16.8	4.6%	12.8	3.5%
Automotive	5	708.1	27.7	3.9%	21.1	3.0%
Banking	11	6.027.5	34.2	0.6%	26.0	0.4%
Chemical	7	214.6	7.1	3.3%	5.4	2.5%
Consumer products	21	636.4	13.5	2.1%	10.3	1.6%
Energy & utilities	10	481.8	8.3	1.7%	6.3	1.3%
Industrial products	17	437.9	2.8	0.6%	2.1	0.5%
Investment management	9	1,440.9	7.2	0.5%	5.4	0.4%
Real estate	3	25.3	0.9	3.6%	0.7	2.7%
Retailer	5	84.6	13.7	16.2%	10.4	12.3%
Technology	10	214.1	6.5	3.0%	5.0	2.3%
Telecommunication	4	310.8	31.5	10.1%	23.9	7.7%
Other sectors	4	46.2	3.4	7.4%	2.6	5.6%
Total	**113**	**10,991.9**	**173.6**	**4.4%**	**131.9**	**3.4%**
Total (excluding banking sector)	**102**	**4,964.4**	**139.3**	**4.8%**	**105.9**	**3.6%**

It is clear that operating leases are concentrated in certain business sectors, although there may be a dispersion of values within each sector. As shown in the table above, the business sectors with higher use of future lease payments include the retailer (16.2%) and telecommunication (10.1%) sectors.

This study shows that the average ratio between future undiscounted minimum lease payments and total assets of the analysed entities is 4.8% (excluding the banking sector), while the average future discounted minimum lease payments represent 3.6% of the entities' assets (excluding the banking sector). An aggregate analysis for some business sectors shows that the ratio between future minimum lease payment and total assets exceeds 5% of total assets.

It should also be noted that the amount of future minimum lease payments for individual entities belonging to a business sector might be very different from the average value due to the abovementioned dispersion of values within the sectors. The results of analysis are in line with expectations as the retailer and telecommunication sectors use the operating lease extensively.

Table 4 details the breakdown of entities belonging to different business sectors. For example, 10% of entities providing disclosures on operating leases (11 out of 113 entities) have an estimated future minimum lease payments and total assets ratio between 20% and 50%, which is higher than the total average of 3.4%. However, 25% of telecommunication companies (1 out of 4 companies in the sector) have an estimated future minimum lease payments and total assets ratio between 10% and 20%, which is higher than the industry average of 7.7%.

Table 4. Analysis of the ratio between future discounted minimum lease payments and total assets

Business sectors		<1%	1 – 5%	5 – 10%	10 – 20%	20 – 50%	50 – 100%	>100%	Total
Aerospace, defence, airlines, and transport	3.5%	3 – 43%	1 – 14%	3 – 43%	-	-	-	-	7 – 100%
Automotive	3.0%	1 – 20%	3 – 60%	1 – 20%	-	-	-	-	5 – 100%
Banking	0.4%	8 – 73%	2 – 18%	-	-	1 – 9%	-	-	11 – 100%
Chemical	2.5%	2 – 29%	4 – 57%	-	1 – 14%	-	-	-	7 – 100%
Consumer products	1.6%	4 – 19%	5 – 24%	2 – 10%	4 – 19%	5 – 24%	1 – 5%	-	21 – 100%
Energy & utilities	1.3%	4 – 40%	5 – 50%	-	1 – 10%	-	-	-	10 – 100%
Industrial products	0.5%	5 – 29%	7 – 41%	4 –24%	1 – 6%	-	-	-	17 – 100%
Investment management	0.4%	3 – 33%	5 – 56%	-	-	1 – 11%	-	-	9 – 100%
Real estate	2.7%	-	3 – 100%	-	-	-	-	-	3 – 100%
Retailer	12.3%	-	-	3 – 60%	-	1 – 20%	-	1 – 20%	5 – 100%
Technology	2.3%	-	6 – 60%	2 – 20%	1 – 10%	1 – 10%	-	-	10 – 100%
Telecommunication	7.7%	-	-	3 – 75%	1 – 25%	-	-	-	4 – 100%
Other sectors	5.6%	1 – 25%	-	1 – 25%	-	2 – 50%	-	-	4 – 100%
Total	3.4%	31 – 27%	41 – 36%	19 – 17%	9 – 8%	11 –10%	1 – 1%	1 – 1%	113 – 100%

4.1 Effects on Entities Performance

IFRS 16 requires an initial recognition of the so-called "right of use" of the assets and a corresponding financial debt for all leases (without any distinction between operating and finance leases). Subsequently, the right of use of the asset will be depreciated, and financial debt will be measured using the amortized cost method provided by IAS 39 (thus charging the related financial charges in the income statement). Currently, IAS 17 requires the recognition of assets for only finance leases, while operating lease costs are recognized on a straight-line basis in the income statement over the term of the contract. As mentioned before, when the lessees record the operating leasing using IAS 17, entities record only the fee on an accrual basis in their EBITDA without impacts on financial statement position. Using IFRS 16, the lessees record the lease in a different way. In particular, entities must record all leases in the financial statement position (assets and financial liabilities) with an exemption for only low-value and short-term leases. Entities must record the lease in the income statement on different lines: i) low-value and short-term leases in EBITDA; ii) the amortization of the right of use in EBIT; and iii) interest related to financial debts in the interest charges. In addition, entities will have a temporary effect on income net results. Using IFRS 16 requirements, the entities must record the amortization of the right of use on a straight-line basis and the interest charges related to financial debts. Therefore, entities record the amortization plus the interest charge on debt, and the interest charge decreases as the financial debt decreases. Thus, using IAS 17, entities record the cost of operating leasing along with the contractual period; using IFRS 16, entities record a higher cost in the first part of the contract and a lower cost in the second part of the contract.

The application of IFRS 16 will generally have the following effects on the income statement of entities with

operating leases over the duration of the agreement:

- Increase in EBITDA (due to the absence of operating lease payments reported as "service costs" and, therefore, above EBITDA);

- Increase in EBIT (due to the absence of operating lease payments, which is partially offset by the depreciation of the right of use of assets);

- Increase in financial charges (arising from the adoption of the amortized cost method to finance lease debt);

- No effects on net results over the entire contract term.

There will be no effect on net profits over the length of the entire contract. However, when adopting the new standard, more costs will be recognized in the first few years of a contract because higher financial charges are recorded in the first years and lower charges in the latter years of agreements through the amortized cost method (only variable lease payments and fees for leases of low-value assets will be recognized as components of EBITDA).

Table 5 shows EBITDA of the entities under review and their EBITDA/revenues ratio. It also shows an estimate of EBITDA and the new EBITDA/revenue ratio if all leases were recorded as required by IFRS 16. This study does not consider the banking sector because EBITDA is not considered a relevant indicator of sector performance; the banking sector uses another APM to monitor its performance.

Table 5. EBITDA/revenues for IAS 17 and IFRS 16

Business sectors	EBITDA		EBITDA/revenues		EBITDA
In Euro 000,000	IAS 17 (actual)	Applying IFRS 16 (estimate)	IAS 17 (actual)	Applying IFRS 16 (estimate)	increase IFRS 16 *vs* IAS 17
Aerospace, defence, airlines, and transport	23.318	30.011	10%	13%	29%
Automotive	39.226	49.357	9%	12%	26%
Banking	n.a.	n.a	n.a.	n.a.	n.a.
Chemical	34.124	35.611	24%	25%	4%
Consumer products	55.956	80.448	7%	10%	44%
Energy & utilities	43.760	45.120	18%	18%	3%
Industrial products	10.211	11.008	14%	15%	8%
Investment management	13.581	14.212	5%	5%	5%
Real estate	1.545	1.706	9%	10%	10%
Retailer	21.769	24.300	16%	18%	12%
Technology	28.388	29.031	21%	21%	2%
Telecommunication	42.441	44.097	32%	33%	4%
Other sectors	4.275	4.985	10%	12%	17%
Total	318.593	369.887	15%	16%	14%

The analysis estimates that IFRS 16 will improve the EBITDA/revenue ratio and will result in an EBITDA improvement from 15% to 16% for the average of analysed entities; the EBITDA increase in absolute terms is estimated to be 14%. The impact of the application of IFRS 16 will be different depending on the use of operating lease contracts among the different business sectors.

Table 6 shows the distribution of entities belonging to different business sectors. For example, 35% of industrial products companies (6 out of 17) reported an increase higher than 10% in the estimated EBITDA compared to the current one, with an 8% industry average. Moreover, 29% of entities operating in aerospace, defence, airlines, and transport (2 out of 7) reported an increase in the estimated EBITDA between 1% and 5% compared to the current one, which is smaller than the 29% industry average.

Table 6. EBITDA/revenue analysis for IAS 17 and IFRS 16

Business sector		<1%	1 – 5%	5 – 10%	>10%	Total
Aerospace, defence, airlines, and transport	29%	-	2 – 29%	2 – 29%	3 – 43%	7 – 100%
Automotive	26%	-	2 – 40%	2 – 40%	1 – 20%	5 – 100%
Banking				n.a.		
Chemical	4%	2 – 29%	3 – 43%	1 – 14%	1 – 14%	7 – 100%
Consumer products	44%	3 – 14%	5 – 24%	6 – 29%	7 – 33%	21 – 100%
Energy & utilities	3%	3 – 30%	2 – 20%	4 – 40%	1 – 10%	10 – 100%
Industrial products	8%	1 – 6%	6 – 35%	4 – 24%	6 – 35%	17 – 100%
Investment management	5%	1 – 11%	8 – 89%	-	-	9 – 100%
Real estate	10%	-	1 – 33%	1 – 33%	1 – 33%	3 – 100%
Retailer	12%	-	-	2 – 40%	3 – 60%	5 – 100%
Technology	2%	1 – 10%	2 – 20%	1 – 10%	6 – 60%	10 – 100%
Telecommunication	4%	-	2 – 50%	1 – 25%	1 – 25%	4 – 100%
Other sectors	17%	-	1 – 25%	-	3 – 75%	4 – 100%
Total	**14%**	**11 – 11%**	**34 – 33%**	**24 – 24%**	**33 – 32%**	**100%**

4.2 The Impact on the Net Financial Position

As previously mentioned, IFRS 16 requires the recognition of the right of use of assets and the corresponding financial debt. The current IAS 17 requires the recognition of assets for only finance leases. The adoption of IFRS 16 will generally have the following impacts to the financial position of entities with operating leases:

- an increase in the assets recognized in the statement of financial position;

- an increase in financial indebtedness.

Table 7. Ratio between long-term debts and equity

In Euro 000,000	Financial indebtedness				Indebtedness/equity		
Business sectors	IAS 17 (actual)	IFRS 16 (estimate)	Var %	Adjusted debt (annual fees x 8)	IAS 17 (actual)	IFRS 16 (estimate)	Adjusted debt (annual fees x8)
Aerospace, defence, airlines, and transport	100,348	117,130	17%	119,120	103%	120%	123%
Automotive	53,486	81,199	52%	84,486	33%	50%	52%
Banking				n.a.			
Chemical	22,234	29,344	32%	30,187	36%	47%	49%
Consumer products	140,317	153,804	10%	155,404	72%	79%	80%
Energy & utilities	97,315	105,590	9%	106,572	57%	62%	62%
Industrial products	27,955	30,717	10%	31,045	88%	97%	98%
Investment management	5,522	12,685	130%	13,534	6%	13%	14%
Real estate	2,242	3,149	40%	3,257	33%	47%	48%
Retailer	8,603	22,298	159%	23,923	31%	80%	86%
Technology	31,926	38,453	20%	39,228	32%	38%	39%
Telecommunication	100,392	131,866	31%	135,600	103%	136%	39%
Other sectors	6,235	9,666	55%	10,073	103%	136%	140%
Total	596,573	735,900	23%	752,429	52%	68%	70%

For the analysed entities, Table 7 shows the following:

- financial indebtedness shown in the financial statements on 31 December 2016;

- estimated increase in medium- and long-term debt arising from the application of IFRS 16 (on the basis of the disclosures provided and related to operating lease payments in the notes to the financial statements) and the related percentage increase;

- estimate of medium- and long-term debts "adjusted" by analysts to include the impact of lease payments in evaluating the net financial position of the entity (from market practice, the adjustment is calculated multiplying by 8 the annual operating lease payments);

- ratio between long-term debts and equity using the following:

    – actual data in the 2016 financial statements;

    – the estimated medium- and long-term debt arising from the application of IFRS 16;

    – the estimated medium- and long-term debt adjusted by market analysts according to market practice.

Considering the fact that this parameter does not appear to be significant for the banking sector, the analysis was not performed.

5. Conclusions

This study shows that IFRS 16 will have a significant impact on the financial statements of lessees in terms of both the financial position and economic performance in certain business sectors. This research estimates the impacts that the new standard could have on balance sheets and income statements. In particular, on balance sheets, there will be an increase in lease assets, an increase in financial liabilities and a decrease in equity; on income statements, there will be an increase in EBITDA and an increase in finance costs.

This study estimates that in 2016, the discounted minimum lease payments for listed companies were 131.9 billion and that the sectors retailer and telecommunication had significant use of operating leases. The performance will be significantly affected by the changes introduced by IFRS 16. On the one hand, the operating results will increase the EBITDA/revenues ratio, which will increase from 15% to 16%, with EBITDA increasing by 14% using IFRS 16 compared with IAS 17. On the other hand, financial metrics will be significantly affected by IFRS 16. This research estimates that debts will increase by 23% and that the ratio debt/equity will increase from 52%, using IAS 17, to 58%, using IFRS 16. Another important result identified in this study is that the market participants generally overstate the estimates related to the debt for operating leases. The rating agencies typically estimate the debt related operating leases multiplying the instalments recorded in the income statement by 8; thus, they would estimate the debt/equity ratio using IFRS 16 to be 70%, while this research estimates the ratio to be 68%.

Entities will have to accurately determine the impacts of the new standard and pay particular attention to the following aspects:

- the impact on finance covenants;
- communications with the market;
- the impact on the cost of debt;
- the impact on capital, financial and economic metrics;
- the changes needed in the information systems in order to manage the new lease accounting in accordance with the new standard.

Conversely, it is assumed that the new accounting model will allow for better financial statement comparability and a better evaluation of entities' financial position.

We believe that IFRS 16 will impact some of the main KPIs and APMs of entities; thus, we expect that entities will update their tools to communicate to market their performances. We expect that IFRS 16 could affect the models used by analysts in the valuations of entities.

The main contributions to the literatures are the estimate of the impacts of the new IFRS 16 on the different sectors, the identification of impacts on APMs and start a debate on how this new accounting standard could affect the company valuations.

As we have already summarized the main conclusions of our research, we end with three specific suggestions (or themes) for future research regarding the evolution of financial statements.

First, in terms of the impacts on models and APMs/KPIs, new studies could exploit how entities will change their APMs/KPIs and how market participants will update their entity valuation models.

Second, in terms of the costs and benefits of new rules, new studies could exploit the costs incurred by entities to apply the new standard and the benefit that it should generate.

Third, in terms of the impacts on models and transactions, new studies could exploit how market participants will update their entity valuation models and if transaction prices will be affected by new performance metrics.

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Status-quo and Development of Cutting-tool Industry in Taiwan and China

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Abstract

Cutting plays a very important role in the manufacturing industry. The global industries of general machinery, automobile, aviation and aerospace, energy, medical, rail transit, mold and machine tools, etc. cannot do without cutting-tool equipment. Modern efficient cutting-tools focus on high accuracy, high efficiency, high reliability and customization. The type numbers and varieties of cutting-tools produced in Taiwan and China are becoming rich day by day. Therefore, this research explored the cutting-tool industry in Taiwan and China, and employed expert interview, five forces analysis, and PEST analysis to analyze the industry. This study offered conclusions based on the research results and provide specific, substantial business improvement, policy formulation and other related recommendations for relevant industry, government-related units and academic research.

Keywords: cutting-tool, five forces analysis, PEST analysis

1. Introduction

Based on the requirement for high product quality and higher accuracy for high additional value parts needed for machining and the machining tools for producing and making high-precision products, the industrial circle has changed gradually from traditional machining tools to the use of cutting-tools with high performance, high efficiency. In addition, due to the automation of machinery and equipment and the need for high performance, high-precision machining equipment has become an integral part of industry growth (Hung, 2011). The biggest customer of cutting-tools is the metal machining industry. They are generally applied in the complicated machining of relevant spare parts in such industries as space, biological medicine, automobile, railway, shipbuilding, machine building, and being even more necessary production equipment (Li et al., 2018). A basic characteristic of the cutting-tool product market is that the users are widely distributed and the demands are extraordinarily complicated. A small customer may need different types of cutting-tools from several or more cutting-tool companies. With the development of new machining technology and sophisticated products becoming increasing precise and integrated, developing modern special-purpose, efficient cutting-tools with high accuracy, high efficiency and high reliability for better machining properties and economy has become the consensus of the industry (Shih, 2011). With elapse of time, the type numbers and varieties of cutting-tools produced in Taiwan and China are becoming increasingly abundant (Zhang and Wang, 2017). Cutting-tools are widely used by various industries, including automobiles, machines, bicycle industry, mechanical industry, household electric appliance industry, mold industry, screw and cap industry and electronic industry, all of which need to use that product. As the product varieties are numerous and what is required by the modern machine tools, modern cutting-tools are the provision of a personalized solution, the product portfolio can be adjusted according to the market changes when the industrial prosperity changes to have strong ability to respond to operational environment changes. In which, end mill has become a main stream of cutting-tools due to wide use. Recently, the automatic machines like CNC milling machine for machining centers, etc. have been using a lot of tools for metal mold machining. All the manufacturers of automobiles, household electric appliance, plastic products, etc. use metal molds in large quantities with a lot of end mills to be used. So the demand of market for cutting-tools is larger.

The cutting of metal materials always plays a very important role in small and medium industries. With scientific and technological development, though various cutting methods such as electrochemical cutting, melt cutting, chemical corrosion, electro-discharge machining, supersonic machining, laser machining have come into being

in development for metal material cutting, cutting with cutting-tools, among the methods used by all machine tools and some hand tools currently, is still the most principal and widely used method. The essential conditions for modern metal cutting are machine tools, control system and cutting tools as the methods used. The essential conditions for modern metal cutting are the three ones as machine tools, control system and cutting tools. The machine tools provide acting forces, the control system provides various motions and the cutting tools provide high-hardness cutting edges (Li, 2001). The demands in the cutting-tool market over the world are growing constantly. In which, the growth in European, North American countries is stable, especially in East European countries; the Asian market has had a slight recovery where the market potential is very large. The growth in Latin American countries is conspicuous, especially in Mexico. At present, Taiwan and China has developed into one of the most potential cutting-tool markets for development globally, where it is becoming a development trend of the cutting-tool industry that domestic cutting-tools equivalent in performance are produced in place of import to meet the demand of domestic high-end manufacturers for efficient cutting-tools (Tzou, 2013). Therefore, this research explores the cutting-tool industry in Taiwan and China and makes full use of expert's interview method, five forces analysis and PEST analysis to analyze the industry. This research will draw conclusions based on the research results and provide specific, substantial business improvement, policy formulation and other related recommendations for relevant industry, government-related units and academic research.

2. Literature Review

The global manufacturing industry has begun to develop modern efficient cutting-tools suitable for different specific machining conditions in place of traditional stereotyped standard cutting-tools. This new development strategy first achieved great results in the automotive industry and was promoted to other industries rapidly. In recent years, the fact that modern efficient customized cutting-tools with high accuracy, high efficiency and high reliability replace traditional standard cutting-tools has become a mainstream of development of the tool industry in advanced countries (Shih, 2011). In which, the application in auto & motor is one of the highest applications currently. In the process of manufacturing engine system, driving system, steering system, braking system, vehicle body system…etc., mold opening, boring, drilling and milling are required for relevant spare parts. The machining parts in automobile industry are characterized by diversity and large quantity. With recent new breakthroughs in the machine tool technology, rapid cutting has been realized to shorten cutting time and improve machining surface accuracy. (ASKIC, 2014; Li et al., 2018). The materials used for cutting tools in the 19th century were mainly high-carbon steel. Until early 20th century, high-speed steel came into being in development. As the cutting tools made of high-speed steel has very high hardness and strength, the metal cutting industry was almost reformed. After the middle of the 20th century, metal cutting further evolved into sintered carbide cutting-tools. The use of ceramic tools in recent years has even more raised the manufacturing ability of human beings in metal cutting. Especially for today's CNC machine tools, without the advent of sintered carbide cutting-tools, etc., it would be impossible for them to work effectively (Li, 2001). Through tens of years of development, the tool materials produced in Taiwan and China currently have developed gradually from one or two type numbers initially to a complete series being able to meet the machining of such materials as various cast irons, powder metallurgical materials, high-temperature alloys, quenched steel (Zhang and Wang, 2017).

For a long time in the past, manufacturers, except for a few special needs, selected standard cutting-tools as possible as they could. Standard cutting-tools, though not best in performance, are widely accepted due to being economical and practical. Therefore, the traditional cutting-tools industry mainly focused on supply standardization and universalization. However, this concept has begun to change in advanced countries in recent years. As a result of the economic globalization development, the competition in the manufacturing industry is increasingly fierce. Therefore, the manufacturers commit themselves to heightening efficiency and reducing costs. Besides, the scientific and technological progress makes the customization requirement increasingly higher. Therefore, though standard cutting-tools are low in costs and relatively easy to purchase and manage, their universality results in a substantial reduction in machining efficiency. Thus, the global manufacturing industry has begun to commit itself to developing modern efficient cutting-tools suitable for different specific machining conditions. Therefore, modern efficient and advanced cutting-tools will gradually become a market mainstream in future. In particular, a lot of advanced machine building factories have made the requirement to tool factories to supply some efficient and advanced cutting-tools and efficient and special-purpose cutting-tools. However, due to partial tool factories being insufficient in technology, they fail to supply or can only supply a small part of the demands from machine building factories. Modern cutting-tool industry has developed gradually from traditional simple machining type enterprises into development type enterprises relating to basic

tool materials, surface treatment, basic process and complete services, etc. with comprehensive high-tech characteristics. Modern efficient cutting-tool industry applies high technologies to design cutting-tool structure compositely and accurately. Under the demands for high precision and customization, composite cutting-tools integrating multiple functions are the trend of cutting-tool structure development currently. The accurately convertible structure raises the utilization rate of cutting-tool materials remarkably. In relation to tradition, modern efficient cutting-tools are characterized by high accuracy, high efficiency and high reliability, customization, etc., having become a mainstream of tool industry development in advanced countries (Shih, 2011; ASKIC, 2014).

In the new wave of world economic integration, it represents a general trend that the global manufacturing industry accelerates moving to Mainland China. China will also develop gradually into a world class manufacturing base. With the rapid development of such precise manufacturing industries as automobile, aviation, military, mold, refrigeration, power in China, the requirement for the quantity and quality of metal machining cutting-tools is also increasing rapidly. The quantity of high-speed and efficient CNC machine tools and machining centers available in the manufacturing industry in China is also increasing rapidly. A large amount of efficient and advanced cutting-tools are very much needed. At present, the demand for high and medium class molds in Chinese market is very large. However, it is required that domestic molds must meet the needs of users in such aspects as quality, delivery date. Moreover, the demand of such industries as household electric appliance, automobile, plastic products for molds is the biggest. In respect of the international market: in recent years, the labor costs in industrially developed countries have increased and they are moving to developing countries, especially Southeast Asian countries. In these countries, they focus on producing highly precise molds and rely on import to meet the demand for those molds requiring a lot of labor input. Therefore, the international market potential for low and medium class molds is very huge. As long as the quality of domestic molds can increase and the delivery time can be ensured, the prospect for mold export is very optimistic. Therefore, it can be said that China is a cutting-tool market with the highest development potential globally. A lot of transnational groups take their cutting-tool sales expansion in China as the first choice in their own development strategies. Many enterprises also have their Asia-Pacific head offices, R&D centers, training centers and logistics centers settled in China to center around China and radiate to Asia, so that they can serve customers more conveniently and better satisfy the needs of the customers in Asia-Pacific region. The cutting-tools imported by China annually account for around 1/3 of the total amount in the market, all of which are modern efficient ones. However, among the cutting-tools made domestically in China, the cutting-tools that can be modern efficient ones only account for 10%~15%. This indicates that in the meantime that China is becoming a cutting-tool market with the most development potential globally; the high-end market is occupied by transnational enterprises. The development of domestic cutting-tools in China is an arduous task with a long way to go. In the Asian market, the cutting-tools of Taiwan and Korea also have a certain position in China. Especially, the cutting-tools of Taiwan are very popular with Chinese customers due to low price and good practicality (ASKIC, 2014; READ01.COM, 2016).

3. Research and Analysis

From raw material development to production, the scope of modern cutting-tool enterprises includes the surface treatment technology and equipment development and application, the development and application of special-purpose numerical control technology and equipment for tool production. If cutting-tools fail in the course of production, the manufacturing work will stop suddenly resulting in a great loss. Under the traditional production mode in the tool industry, a cutting-tool enterprise is only a standard cutting-tool producer and supplier and a lot of technical and management problems on the site where cutting-tools are used are solved by the users themselves. After development into the modern cutting-tool industry stage, what the cutting-tool industry provides to the users is not merely simple cutting-tool products, but also general solutions to cutting problems. Especially, it provides advanced cutting-tools and quality services. Besides, the types and forms of cutting-tool products are diverse. The demand lot size of individual users for individual products is small. The demands of different users for products are characterized by being few in variety and small in lot size. Therefore, a producer needs rich production lines and the production management is highly difficult (Shih, 2011). Therefore, the research makes relevant analysis to the cutting-tool industry in Taiwan and China, has an expert interview with the well-known cutting-tool industry manufacturer executive chairman in Taiwan and uses five forces analysis and PEST analysis to analyze the status-quo and development of the cutting-tool industry in Taiwan and China.

3.1 Five Forces Analysis

It was presented by Michael Porter in 1979. The purpose is to define the degree of attraction of a market. Port

thought that the five forces influencing market attraction were the micro-economic level instead of macro-economic level as generally thought. The five forces are "customer bargaining power", "supplier bargaining power", "barriers to entry", "substitutes" and "existing competition" respectively. They are constituted by such structural planes as having a close influence on company service to customers and profit-making. Any force change may attract a company to withdraw from or enter into market (Porter, 1980).

a)   Customer bargaining power: At present, there are numerous competitors in the markets in Taiwan and China. The loyalty of customers to companies is low. For low demands or odd orders, it is only needed to establish a cooperation act based on general market selling price if a customer company is in normal operation. But for those companies under long-term cooperation and customers with large demands, it is necessary to lower the sales price to maintain a long cooperation relationship.

b)   Supplier bargaining power: In recent years, constant global raw material (especially carbide tungsten, petroleum) hiking has resulted in the costs of the cutting-tool companies in Taiwan and China rising.

c)   Threats from entrants: The technical level of the cutting-tool industry is high. Therefore, in the cutting-tool market, certain capital and technology is required to access to that industry, such as market factory establishment, technology acquisition, technology studying, high costs. It is not easy to enter into this kind of oligopoly market. The most possible threat from potential entrants is the scale economy they trigger. This may allow them to occupy market at a low cost and results in the profits of cutting-tool companies becoming less and loss of customers.

d)   Threats from substitutes: In the cutting-tool market, the cutting tools that can be used on miller or machining machines are only milling cutters. In the cutting-tool market, there is almost no substitute being able to replace the function of milling cutters according to the current level of science and technology. Unless technical tools at a higher level can be innovated in place of the existing milling cutters in the market, there is almost no threat from substitutes.

e)   Competitive intensity of existing competition: With the prevailing of precise spare parts in recent years, the competitions in the cutting-tool industry in Taiwan and China have become increasingly fiercer. Therefore, in face of more and more competitors in the market, there can be breakthroughs only through constant technical upgrading and innovation and cost reduction; and the cutting-tool market scale abroad is also rising year after year.

3.2 PEST Analysis

The PEST analysis is a kind of model using environmental scanning to analyze such four factors as political, economic, social and technological in the general environment. This is also part of external analysis in market study and can give a company a description of different factors in general environment. This strategic tool can also help to know effectively market growth or declining, the situation which an enterprise is in, the potential and operating direction of an enterprise.

a)   Political: In recent years, the labor laws in Taiwan and China have become increasingly strict. Personnel cost increase brought by foreign laborers has resulted in overall cost increase. However, such policies as "one belt one road" and "manufactured in China 2025", promoted by China will be a major favorable factor to the cutting-tool industry.

b)   Economic: In recent years, Chinese economy has grown fast. In the electronic industry, unmanned vehicles, electric vehicles, smart household electric appliance…etc. have flourished. It is estimated that there will be profits to make in future 5-10 years.

c)   Social: For Taiwan, the biggest problem brought to that industry by the existing social factors such as population growth reduction, age structure rising, population migration is lack of laborers and technicians. Therefore, it is imperative to employ foreign laborers or relocate factory buildings to foreign countries. In China, the social factors are also complicated and big challenges are also confronted.

d)   Technological: The scientific and technological progress and the wide application of IT technology in the manufacturing industry have changed the traditional business process and working methods greatly and raised the production efficiency and competitive power of the manufacturing industry (Peng, 2012). The future tool industry in Taiwan and China will have a development trend due to production demands.

4. Results and Discussion

In recent years, one of the trends in the international manufacturing industry is active upgrading and transformation. The modern cutting-tool industry developing from the foundation of the traditional cutting-tool industry keeps on developing and updating the processing technology to respond to the global environmental

changes. It has turned from paying attention to cost performance in the past to taking efficiency priority as the main target. The modern efficient cutting-tools can be reduced to high accuracy, high efficiency, high reliability and customization. Therefore, single enterprise operation is not economical in scale. To realize external scale, it is necessary to establish a large group type enterprise for a synergetic effect in common technical development, sales, service, etc. In which the most crucial is customization. Customization is to provide a set of efficient processing scheme according to the specific requirements of customers, including soft and hard technologies, and stronger soft and hard technology is the core of modern efficient cutting-tools and also the core competitive power of cutting-tool enterprises. The current machine tool development trend is high rotation speed, high accuracy and high quality. The requirement of high-speed operation for the surface treatment to molds, cutting tools and mechanical parts is becoming higher and higher. More service life, less production costs and higher profits are the common target pursued by operators. To coordinate with high-speed machining, save substantial machining time and costs, the development of cutting-tools has become an important factor. Due to higher wear resistance and better hardness, the proportion of tungsten carbide cutting-tool is increasing day after day in the cutting-tool market. In the development of modern efficient cutting-tools, it is imperative to pay attention not only to the hard alloy cutting-tools being large in quantity and wide in range, but also to the super hard cutting-tools and high-performance high-speed steel cutting-tools of which the use demands are growing sharply. Therefore, in the development of the modern manufacturing industry, higher machining quality and efficiency is a perpetual pursuit. The modern efficient cutting-tools are the customized cutting-tools of high accuracy, high efficiency and high reliability serving this kind of requirement (Hung, 2011; Shih, 2011; ASKIC, 2014; Chinabgao.com, 2017).

The development and production of cutting-tool materials is closely related to modern cutting-tool enterprises. For example, the application of super hard materials and super fine grain hard alloy materials has resulted in a substantial increase in the cutting speed of modern cutting-tools. And machining has entered into a era of high-speed cutting. In addition, the development and application of advanced numerical control machining technology has also become an important condition for the modern cutting-tool manufacturing industry to ensure the product quality. Therefore, most manufacturers pursue quality, price, difference and complete specifications and take the maintaining of market share as their main competitive strategy. At present, most internationally renowned transnational cutting-tool groups have their own tool material factories or R&D departments. The comprehensive and high-tech characteristics of modern tool enterprises also determine the constant expansion of their operating technology operation, thereby promoting the production and operation centralization and scale. Therefore, the international organization structure of most internationally renowned transnational tool groups is large and strong all-round development type. At present, in respect of domestic cutting-tool materials (especially the super hard cutting-tool materials), tool surface blank manufacturing technology and coating technology, there is some gap between Taiwan and China and international leading manufacturers. It is suggested that in addition to technical sharing and cooperation in development by enterprises, relevant governmental units can also input relevant resources to upgrade technical development and guide market resources allocation, assist standard development and inspection and test and establish a good platform for foundation construction and industrial technology innovation service (Shih, 2011; Tzou, 2013).

Low carbonization is an important development direction of the manufacturing industry. The implementation of the "low carbon" philosophy and the application of "low carbon" technologies will have the adverse influence of the manufacturing industry on environment minimize and the utilization of resources maximize in the whole product life cycle from design, manufacturing, packaging, transportation, usage, maintenance until scrapping treatment and aftermath handling. This part is also one that the cutting-tool industry should lay emphasis in its future development. At the level of value chain, the cutting-tool industry should expand to the high end of value chain. Generally speaking, the structural upgrading of the manufacturing industry is to follow the route of process upgrading-product upgrading-function upgrading-value chain upgrading to realize the climbing from "the low end of value chain" to "the high end of value chain". The upgrading of value chain mainly has two routes, one is to be based on this value chain to leap from the production link to the link of design and marketing, etc. with abundant profits to change the position of an enterprise itself in the value chain; the other is to leap from one value chain to another value chain which is new with a higher value and stronger profit-making ability in relevant industry. Moreover, union standard promotion can be used as a useful weapon to promote industrial cluster development, follow through and implement union standards, strengthen enterprise cooperation within a cluster, upgrade industrial competitive power and drive regional economic development to realize a leap-forward development and optimized configuration of such resources advantages as talent, policy, information, fund, in relevant units and departments, construct a platform for technical development, product testing, standard development, information sharing and cooperation exchange to provide technical support for union

standardization, promote scientific and technological innovation and standard innovation linkage, promote the upgrading of the tool industry. Due to the varieties produced by enterprises being numerous and the difference between tool application scope and consumption being great, it is suggested to take the lead to develop and implement union standards for those "nonstandard tools" produced and used in large quantities by tool enterprises currently to fan out from point to area, expand gradually, give play to the effect of union standards to promote industrial structure regulation, raise the utilization rate of industrial resources,promote the technical progress and independent innovation of tool industrial clusters and provide a technical guarantee for the scientific development, regulated developed and continuous development of tool industrial clusters (Peng, 2012; Tzou, 2013).

Cutting-tool products are industrial products (non-consumer products) with low unit price and separate purchase and use. Therefore, in sales, technical service is stressed in particular. In face of the grim market situation, it is imperative to increase the added value of products through heightening service. Just like machine tools, customers who purchase cutting-tools do not need the cutting-tools themselves. What they even more need is to attain their perfect cutting requirements. Therefore, for cutting-tool manufacturing enterprises, they cannot merely describe the performance indexes of cutting-tools themselves in selling cutting-tools but also need to study the materials of the work pieces to be machined by customers and give a systematic solution in combination with their costs. Besides, distribution through agents can increase market coverage and reduce the sales costs. In addition, in industrial boom fluctuations, product portfolio can be flexibly adjusted with market changes for strong ability to respond to operational environment changes. The tool market is very wide and the product varieties are very complicated. A few big enterprises can be far from sufficiency. The medium and small enterprises can select a certain product variety or a certain segment market to develop their own characteristics and special advantages and make every effort to establish a good brand image in the international market. Under high competitions, the international tool industry development is becoming increasingly centralized. That the tool industry raises the service level is the inevitable result of the high development of modern manufacturing industry specialization. The trend of manufacturing industry and service industry integration is accelerating. Currently, the manufacturing and service functions of a lot of enterprises have been integrated. The economic activities of some enterprises have even shifted from centering around manufacturing to service. Therefore, an enterprise with strong development ability and economic strength will have the opportunity to stand out and become a main force promoting and leading the industrial development (Hung, 2011; Shih, 2011; Peng, 2012; READ01.COM, 2016).

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Assisted Christian Schools Governance, Practices, Boards Commitments and Performance Measures in Sri Lanka

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Abstract

Education has been playing the most important pivoting role in the development of human civilization in the present. Hence, education is inseparable and it is imperative to cater to the present needs of the society and prepare the society for a better future. One of the most valuable gifts that the Catholic Church has contributed is the holistic approach in the education, as we need to compete for Knowledge and wisdom; true education is not only training the mind but also the heart leading to wisdom. However the overall performance of the holistic education system faced wide spread controversy and continuing concern about how schools are being managed and controlled has led to many studies on school performance. The purpose of the study is provided evidence from single or a few perspectives such as selected indicators and school governance principals. In addition, there are many inconsistencies in the finding across the world that shows no signal school governance model is appropriate for all schools, countries and economic environments. The study has considered the three different school governance practicess of board clear funtion, sustainable policy, and board charter in capturing the effect of board governance on school performance. In addition, to elucidate school performance is dealing with board governance; the study used four perspective of balance score card as a determinant of school performance. The estimation results suggested that the board clear function, sustainable policy and board charter had significant positive driving forces on school performance.

Keywords: education, catholic church, school performance, governance, boards commitments

1. Introduction

1.1 Introduce the Problem

Education has been playing the most important pivoting role in the development of human civilization in the present. Hence, education is inseparable and it is imperative to cater to the present needs of the society and prepare the society for a better future. It is inevitable that such issues as "knowledge explosion", development of knowledge, new technology and insulating cultural values and norms of the society are crucial to fulfil the true sense of development. Education is a continuous process whether one likes it or not. Each person in society is an integral part in this process. Education can either be a formal or/and an informal process where knowledge and skills are developed when the learner is exposed to a new environment. In the process of educating the society, invariably education institutions, mainly the primary schools play the pioneering role to begin with, where the important foundation for future development of productivity of a nation completely relies. With the focus on icon appraisal, it identifies an effective method of assessing the level of the standard of the school in contributing its share to make a better tomorrow. As a country develops, it is expected to enhance the overall quality of living. As almost everyone in any society works in some kind of organization, they are ultimately confronted on a daily basis with the actions of those in other organizations take. It may be a business firm or school. The main concept of this study is directed towards the operationalization of the school performance concept in order for it to be measured. A major theme in educational research has been the effect of schooling on school performance.

Differences in student achievements and performance between schools were found to be much smaller than within-school differences. Research has revealed that the most influential factors at school level were student and teacher characteristics such as educational beckground, teacher's competence et cetra. Furthermore, the research reveals that factors such as the curriculum of the school, its facilities and teachers' salaries et cetera do not play a substantial impact in student achievement. Furthermore, student achievements can be boosted by a positive school atmosphere, a committed and involved educational leadership, involvement of school management and parents and monitoring students' progress.

1.2 Explore Importance of the Problem

The beginning of the education in Sri Lanka runs many centuries back and it first started with transferring knowledge orally from one generation to another. Firstly, the religious knowledge and philosophies of Buddhism were encapsulated into small verses and delivered by trained pupils. Afterwards, knowledge was written in Ola Leaf Manuscripts and kept in libraries in temples. In those days, learning was confined to religion, philosophy, languages, grammar, literature, et cetera. All education centers (pirivenas or monastic colleges) targeted the production of the clergy and taught a very small number of other students. Understanding of Hindu education was inadequate but there would have been schools based on Hindu temples and they might have been modernized during the Portuguese and the Dutch eras. With the arrival of the Arabs, Muslim education started in the late fifteenth Century and centralized at mosques where the Quran was recited and practiced. After the Portuguese captured the Sinhala Kingdom, education system was reformed by the missionaries who established schools to foster their religion, Roman Catholicism. Parish schools were organized for reading, writing and scriptures and were taught in the mother language. The elementary education was provided to all in the parish while the secondary education was delivered only to the children of the Portuguese civil and military officers or the local chieftains. Other than the scriptures, secondary education was replenished with humanities and rhetoric.

During the Dutch governance, the education system expanded and a number of schools were set up catering to a larger number of children. They took a fair degree of control of such schools under the government from the clergy due to the suspicion that Catholics would support the Portuguese. They established Scholarship Commissions to supervise the schools. It was in 1869 that the British Government in Sri Lanka permitted religious denominations to open and run schools for their children with state aid. The Catholic Church went ahead establishing schools in parishes. The British established Mass Education System in Sri Lanka in the Nineteenth century. They first started schools jointly with the clergy assisted by the government. Later on the government realized the need of the education for the natives as well as the trade and the plantation sectors and designed supportive education. Hence, the dual education system was born. One type of schools operated in the English medium and was fee levying. The other type was the state schools which taught in the mother tongue of children of native common people. With the increase of schools, the government established the Department of Public Instruction to maintain the standard of education and the more they realized the importance of education for natives to mitigate crimes.

By the Twentieth century, Buddhist and Hindu leaders formed their own schools; Buddhist started the Theosophical Society to establish schools with Buddhist culture and Hindu leaders started their own schools with Hindu environment for Hindu children. Subsequently, a number of assisted schools rapidly increased. In the semi independence period, Dr. C. W. W. Kannangara gave rise to a treasured initiation for the prevailing education system and he was able to establish many enactments of education laws, expansion of education and free education from kindergarten to university education on behalf of the native Sri Lankans. With the guidance of Dr. Kannangara's education reforms in the post independent era education was nourished and further expansion of the education system was sustained. 1960-1961 periods were another landmark year in the Sri Lankan education system. The National System of Education was established and under this system except for a few schools, the majority were taken over and maintained under the government. Some degree of rationalization was made possible. The Curriculum Development Center (CDC) established in the 1960s was responsible for School Curriculum Development. The National Institute of Education (NIE) was founded in 1985 with the objective of professional development of teachers, principals and educational administrators. The National Education Commission (NEC) was established with the faith of formulating a national policy on education by an act of parliament. Sri Lankan education system has undergone many reforms periodically to cater to the national and international demands and standards. The reforms carried out in 1947, 1960-61, 1972, 1987, 1992, and 2006 are amongst the most important landmarks in the History of Sri Lankan Education.

Theoretically, the current study will examine the factors that contribute to school performance from the school governance and board ethical commitment perspectives. Based on the research framework of the study, the interdependent variable, school governance will be represented by eight indicators or variables namely, Board

responsibility, Board composition, Board interdependence, Board commitment, Financial reporting integrity, Balance scorecard, School disclose and shareholders' relation. The primary objective is to examine the interaction effect between school governance and board ethical commitment on the performance of the school and the secondary objectives are related to develop sub-indices for the principles of school governance using multiple indicators for each principle, to develop a measure for board ethical commitment and to examine the extent of school rules and regulations with performance measurement will be examined.

1.3 Describe Relevant Scholarship

Board of governance embodies the way a company is directed and controlled (Cadbury Committee, 1992). It provides a mechanism to align the interests of various stakeholders via policies and guidelines for the company to pursue its objectives and the context of the economic regulatory and social environments. Board governance has become an important subject since the collapse of large organizations and fraud by global market players. There are many international bodies like International Board Governance Network (ICGN) and Organization for Economic Co-operation and Development (OECD) that have developed board governance recommendations, the ICGN for example, aims to promote effective standards of board governance to promote efficient markets. Its members comprise global investors from more than 50 countries with assets management in excess of USD26 trillion. On the other hand, OECD works with the governments from various countries to seek solutions on economic, social and environmental problems, while at the same time promoting policies to improve the economic and social well-being of the people around the world. In the US it has significantly influenced the way introduction of the Sarbanes Oxley Act (2002) as to how corporations conduct their business.

There are a number of ways how different models of board governance can be classified. Realizing that no one model of board governance can fit all companies (Skare and Hasic, 2016) as different countries have different sets of laws and regulations, a different approach on board governance is required to align with the operation and management of the companies. For example, it is common for US companies to have a widespread shareholding structure as compared to European companies where concentrated and family-based shareholding is more familiar. Thus, external orientations based on board governance such as take-over rules, shareholders' rights and regulating the work of CEO are more effective in controlling the US companies meanwhile, internal orientations based on board governance like emphasizing on board independence and separation of power between the CEO and the Chairman of the company are more successful in regulating European companies.

Razaee (2008) suggests board governance throughout the world can be divided into close, open and hybrid. The close model is characterized by the three models concentration of ownership and debt capital, less dependence on the capital market, more direct control and oversight by a few major investors such as banks, insurance companies and individual, focus on internal information flow and less information asymmetries between manager and shareholders. On the other hand, the open model is well known as a market based or outsider model. This model is characterized by widespread, diffused and concentrated ownership, high reliance on the capital market to finance business, separation of managerial and oversight function less regulated governance and board activities, focus on extremely information flow and existence of information asymmetries. The last model, the hybrid model is a combination of both the close and open models The close model suggested by Rezaee (2008) is identical with the European model that is predominant in European countries like Germany, while the open model is close to the Anglo-Saxon model that is widely practiced in the US. The open and close models are also known as one-tier and two-tier system of governance respectively by some scholars (Skare and Hasic, 2016).

Another way to classify governance is based on its approaches to disclosure prescriptive, non-prescriptive and hybrid (Finance Committee on Board Governance, 2000). The prescriptive approach is where the standard of board governance has specific requirements and practices, in which the companies are required to disclose their compliance. The companies act and the listing requirements of the stock exchange adopt this approach. The second is the non-prescriptive approach which simply requires board governance practices in a company to be disclosed without any specific or rigid guidelines. The emphasis of this approach is the disclosure of the actual board governance practices. Appreciating that every company is unique, this approach requires the company itself to address their board governance needs that are possibly different from other companies. The last approach is the hybrid approach which considers that there is a need for principles that are broad and general. The companies can apply these guidelines flexibly to the varying circumstances of individual companies. This is known as the "comply and explain" approach. This means that the company has a choice whether to comply or not with the prescribed principles. However, if the company chooses not to comply, the company needs to disclose why it does not comply and the alternative practices or principles that are used to substitute for the prescribed principles.

1.4 State Hypotheses and Their Correspondence to Research Design

Prior studies in board governance show that good board governance practices contribute to good performance of a school. For example, a survey by credit Lyonnais Asia (CLSA) in the emerging markets found that board governance significantly influences board performance. The survey also shows that board governance is positively related with higher return equity, better expenses management and control, more profits superior performance in the stock market and having higher than average return to shareholders. Likewise, another study conducted by Gomper, Ishii and Metrick (2003) also found similar results. Good practices of board governance will give superior return to the shareholders, low cost of capital and higher firm values, sales growth and profitability. There are seven (7) principles examined and tested against board performance in this study, namely board responsibility, board composition, board independence, board commitment, risk management, board disclosure and stakeholders correlation. One of the important mechanism of board governance is board responsibility. Jensen (1993) described the board as the apex of the internal control system of the school. This consists of requirements for the board to have a clear function and responsibilities, commitment to sustainability, good access to information and to establish a board charter. The board will be able to perform its duty effectively when its responsibility is clearly set out (Bebchuk and Weisbach, 2010). For example, Bohm, Bollen and Hassink (2016) found a relation between the scopes of responsibilities set forth in audit committee charters and the frequency of audit committee meetings. Among others, the principles are responsible for monitoring managerial and staff performance, ratifying decisions, providing incentives and aiding strategic planning activities. These responsibilities can be viewed from two different perspectives, first with the board as an advisor and second, with the board as a monitor of the management team (Armstrong, Guay and Weber, 2010).

Agency theory suggests that boards are expected to ensure that the stakeholders' interests are met (Fama and Jensen, 1983) when fulfilling its fiduciary duty to all key stakeholders whereas in this study the management including the principle is expected to satisfy the needs of the customer who are the parents (Blair, 2012). Geletkanycz and Boyd (2011) suggests that when the performance of a company deteriorates, the board will take necessary actions such as revising firm direction, finding valuable resources (Boeker and Goodstein, 1991) and supporting the management team (Carpenter and West phal, 2001) to turn the company around, which will also be the same situation in a school setting. As another example, Tuggle et al. (2010) found that negative performance by a company will increase board attention to monitor and execute disciplinary actions on management whereas in a school, negative performance will cause the school board to closely monitor the teaching staff. (Bhagat and Bolten, 2008). This also forms part of the principal's accountability not only to the staff but also to all other stakeholders in general (Kaey and Loughrey, 2015). As an example, in the banking sector, Jian and Thomson (2008) found that a bank's poor performance is consistent with lack of accountability, poor board governance and board dysfunction, which is associated with fraudulent trading activities. However at the same time, the board does not take tax risks such as underpaid tax and non-compliance with tax regulations that could create a negative impact on its performance, financial statements and reputations. Based on these arguments, the first hypotheses is:

- *H1a: There is a relationship between the existence of a board's clear function and responsibilities based on assisted school performance.*

Promoting sustainability that comprises of environmental, social and governance elements in addition to economic aspects of a business will enhance the reputation of the company as a good citizen in society, same as a school where these elements would uplift its reputation (Orsato, 2006). Furthermore, Perrini and Tencati (2006) suggests that a company creates value when it adopts sustainability-oriented managerial approach. When a school adopts sustainability-oriented managerial approach that too enhances the face value of the institute as an organization. Lopez et al. (2007), for example found the differences in performance between listed and non-listed companies in the Dow Jones sustainability Index. They suggest that firms that inboard sustainability as part of their strategy will have competitive advantage over their competitors who do not adopt this approach (Adams and Zutshi, 2004). A sustainability strategy, which includes consideration of quality, environment, branding, reputation, customer loyalty and human development, will move a company to have better board management as well as in an assisted school setting, where the board will increase its efficiency in board governance, (Orlitzky, Schmidt and Rynes, 2003), good systems, internal control, decision making and cost savings (Adams, 2002) and thus, have a superior performance. Empirical research also suggests that environmental and social performance and its disclosure may affect the schools access to finance (Cheng, Ioannou and Serafeim 2014) and affect significantly and positively the organizational performance (Nobanee and Ellili, 2016).

- *H2a: There is a relationship between the adoption of a sustainability policy promoted by the board and*

assisted school performance

The effectiveness of principles in the performance of their duty is limited by the availability of information and costs associated with acquiring such information (Adams and Ferreira, 2007; Reheja, 2005). The board requires firm specific knowledge and good information to help them perform their role as a principal both as a monitor and advisor. (Armstrong et al., 2010; Bebchuck and Weisbach, 2010). For example, Jensen (1993) admits that even highly talented and experienced directors are unable to perform their roles effectively if they receive limited information, whereas in schools the lack of information received from both the staff and the parents' results of poor performance of the job role of a principal. Because of that, a good principal will be able to overcome a limited information environment by searching for alternative information sources from third parties and soft information from on-going networking relationship (Cassar, Ittner and Cavalluzzo, 2015). Other than that, the board is in a better position to perform its monitoring role of observing the performance of the school due to the information advantages that they possess as compared to outside monitors (Jensen and Meckling, 1976; Fama and Jensen, 1983; Inderst and Mueller, 2010; Ravina and Sapienza, 2010; Ashwin, Krishnan and George, 2016). As such, a conducive information environment is important when resolving agency conflict between various groups inside and outside the school (Armstrong et al., 2010).

For example, limitation on the information system in generation facts and figures relevant to monitor managerial behavior will impair the effects of schools' governance. Principals need such information to help them understand factors that affect the bottom line figures of financial statement, hence, it aids them in the evaluation process (Bushman et al., 2004). When the board functions as an advisor to the institute, they also need rich information to make accurate decisions that will reduce the transaction cost of dealing with uncertainties in the environment (Hillman and Dalziel, 2003) and hence, prevents mistakes that will cost money to the school. Good access to information is critical for the board to make a short-term and long-term view of the school as an organization (Nicholson and Kiel, 2007), achieve successful innovation and it enhances the decision-making process (Donaldson and Davis, 1994). For instance, a study conducted by Baysinger and Hoskisson (1990) has found that the superior amount of quality of information possessed by internal directors is related to high quality investment to research and development (R and D). Hence these arguments lead to the hypothesis below taking cognizance of a school, consistent with the argument forwarded in Signaling Theory.

- *H3a: There is a relationship between the existence of a board charter and assisted school performance.*

2. Method

A variable is an observable item which can assume different values (Smith, 2015; Sekaran & Bougie, 2013). These values can be measured directly or indirectly, through the use of proxy or substituted variables. There are four types of variables in this study, namely dependent variables, independent or explanatory variables, moderating variables and control variables. Dependent variables are variables that are of primary interest to the researcher (Sekaran & Bougie, 2013) and their variability is explained or influenced by independent variables. In this research, the dependent variable is the School performance. A comprehension of the Balance Score Card and the school performance for performance evaluation of children are essential for the school sector to predict their future expectations. The result of the present study will provide variable information to enhance to private sector catholic school performance and the research includes developing the testing of hypothesis in second stage. The study focuses on how the Privet sector school performance can be measured through Balance Score Card use. Further study forces objectives of to measure the private sector school performance, to introduce Balance Score Card as a measuring tool to measure the private sector school performance, to identify the driving and restraining forces in school performance. Finally researcher emphasise the challengers in implementing Balance score card to measure school performance in privet sector school in Sri Lanka. As a consequence, public organizations have been subjected to internal and external pressures in order to adopt practices and carry out actions, which will enable them on the one hand to manage their own impacts better and on the other hand to promote and encourage the adoption by other organizations of behaviours consistent with the preservation and protection. Measuring public sector performance is essential in today's context. This research is directed to measuring school performance through Balance score card. Although income statements, balance sheets, and other traditional accounting reports are useful to stockholders, potential investors, and analysts, such financial reports with their aggregated figures and focus on historical transactions are often of little use to internal managers. Further, traditional reports only indirectly measure the effectiveness of corporate strategy and can leave managers in the dark about whether a specific strategy has been implemented successfully. An independent variable is one that influences the dependent variable, either positively or negatively. A unit increase in the independent variable may cause an increase or decrease in the dependent variable (Sekaran and Bougie, 2013). The independent variables in this study are the board governance attributes of Board clear function, Sustainability policy Good access of information and Board charter.

2.1 Sampling Procedures

Sampling is the process of selecting a sufficient number of elements from the population (Sekaran and Bougie, 2013). The population refers to an entire group of people, events or things of interest that the researcher wishes to investigate while an element refers to a single number of that population (Sekaran and Bougie, 2013). In the context of this research, the population refers to all the schools that are semi-government in Sri Lanka while an element might refer to any single school listed in the population.

For the purpose of this research, this study will include 20 semi-government schools registered under the Education Ministry of Sri Lanka. These particular groups of schools were selected based on the fact that they are highly valued by stakeholders, are secure and stable establishment with ease of access and due to the fact that they have shown major improvements within the past five years in academic and other areas.

The issue that may arise from selecting this type of a sample population of schools is that the research result may introduce bias towards the larger size of the schools. To resolve this issue, catholic/Christian semi-government schools were selected as a control variable so that the effect size will be observed when the statistical analysis is conducted later.

In addition, this sample group is used because it is impossible to study the entire population of schools in Sri Lanka due to the limitations of time and cost. In Sekaran and Bougie (2013) it mentions that studying a sample will lead to reliable results because fatigue is reduced, resulting in fewer errors in collecting and analyzing data.

Furthermore, the selected 20 schools for the data analysis of this research are considered sufficient due to several reasons. Firstly, it is because it represents more than 50 percent of the chosen category of schools which are Christian/ Roman Catholic semi-government schools. Therefore a sample of 20 schools represents approximately 67 percent to 63 percent of the total population of the chosen category. Secondly, the sample size is calculated based on the formula $N>50+8m$, as mentioned by Tabaachnick and Fidell (2013), where m is the number of independent variables and N is the total sample. Therefore since this study consists of 27 independent variables, the minimum size of the sample population should be $50+8(3) = 74$ participants. Eventually, Stevens (2012) recommends 15 participants per predictor or independent variable for a reliable equation in social science research. Thus, based on Stevens (2012), the minimum sample of participants should be $15(3) = 45$. In summary, the sample of 20 schools selected for this research is sufficient to contain 199 participants for this research.

2.1.1 Measures and Covariates

To evaluate board governance variables, the indices were developed from relevant reports. The board governance variables in this study will refer to the board governance guidelines as mentioned in the earlier sections. The information disclosed for all the indices of board governance will be measured using a 3-point Likert scale. "2" denotes beyond level of disclosure (more information), "1" indicates that there is a minimum disclosure while "0" score represents no disclosure (no information). Based on this, a formatted checklist was developed comprising numerous items, as the accumulated score for each item is used to measure sub-indices and ultimately the index.

A 3-point Likert scale is used rather than a 5-point or 7-point Likert scale because it is difficult to assess the governance practices by using the higher point Likert scales in which the differences between the points are marginal and difficult to gauge. For example, the possible 5-point Likert scale that can be developed for this study depicts very poor, poor, average, good and very good. It is very hard for the researcher to differentiate and measure between very poor and poor governance practices and also to indicate between good and very good governance practices. As far as this study is concerned, it is very hard to find a (or possibly none) board governance research that evaluates board governance practices using a 5-point Likert scale as mentioned above. In addition, knowing that there are many items to be scrutinized for each school as an organization, use of a 5-point Likert scale is tedious, time consuming and not feasible to be adopted.

These scales and measures were chosen due to their simplicity and ease of use (Neuman, 2006) and could be used to employ parametric significance test. The data items are also powerful enough to permit the use of regression analysis and other statistical analysis to examine the relationship between independent, moderating and dependent variables.

If a categorical measurement is used, the analysis will be restricted to a mainly non-parametric test. To avoid subjectivity and bias, all items will be considered of equal importance.

The initial instrument was validated by several experts comprising of academics with varying experiences in board governance to enhance its construct validity. After getting the response and the feedback, the final version of the instrument was used for the purpose of this study. A pilot study was then conducted to assess the instrument's feasibility. This was done by using the instrument to evaluate the board governance practices as

disclosed in the annual reports produced by the schools. Then, this instrument was further refined to ensure that no items had overlapped or were redundant and were accurate, complete and easy to understand.

2.1.2 Research Design

There are many types of statistical analyses that can be employed to meet the objective of the research. The multiple regression is the most appropriate statistical analysis that can be used for this research as its objective is to examine the relationship and its interactions between board governance and school performance. In addition, all the variables (independent, dependent and control) are continuous for the independent variables that means board governance practices and their measurement was derived from the aggregated scores received by a school on each item identified as dimensions or variables.

By using multiple regressions, the study is able to understand how well the set of variables predicts a particular outcome. Multiple regressions enable to statistically control the impact of certain variables (control variables) when exploring the predictive ability of the model (Pallant, 2010). In the context of this research, multiple regressions enable to assist this study to determine and explore whether board governance is able to influence school performance. Control variables such as the size of the school, age and leverage can be regulated to limit the influence on the model predictability.

Generally, there are three types of multiple regressions that can be used in statistical analysis, namely standard multiple regression, stepwise multiple regression and hierarchical multiple regression. This study used standard multiple regression to analyze and explore the relationship between school performances (dependent variable) and board governance practices (independent variable) as well as the moderating variable used for the research.

This type of regression was chosen because it is a popular and well known statistical method used in the board governance empirical research. The dependent variable was regressed together with the independent and control variables. Each independent variable that is board governance sub index was evaluated in terms of its predictive power as compared to other independent and control variables. The impacts of control variables were analyzed as well. This method allows the amount of unique variance in the board performance of each of the board governance practices, school size, leverage and age explained. A similar approach had been used by many scholars in research related to board governance. (Like Krafft, Qu, Quatraro, and Ravix, 2013; Donker et al., 2008; Klapper and Love, 2004; Brown and Caylor, 2006).

2.1.3 Experimental Manipulations or Interventions

Quantitative analysis was performed on the data collected from the annual reports disclosed by the schools accessed for the research. These data were first posted to a Microsoft Excel Spreadsheet. Then, the data collected were manipulated, transformed and analyzed using SPSS.

3. Results

3.1 Demografic Data Analysis

In order to measure the demographical statistics, 06 questions were presented in the questionnaire. These questions cover the areas of gender, age, Educational qualification, Work experience, department in the board catergory and job level. These 06 questions were presented to the selected employees in the sample population. A summary of the weightage of each question in the questionnaire along with the percentage of the results are as mentioned below.

Table 1. Analysis of Gender

Gender	Number of board members	Percentage
Female	127	63.8%
Male	72	36.2%
Total	199	100%

As shown in table 1. The percentage of females is 63.8% while the percentage of male is 36.2% out of the sample size of 199 board members.

Table 2. Age Analysis

Age	Number of board members	Percentage
Less than 25 years	30	15%
26-40	111	56%
41-50	33	17%
Above 50	25	12%
Total	199	100%

According to table 2. Out of the 199 board members that was selected for the sample, 15% of the board members

are less that 25 year of age and 17% are in between 41 to 50 years of age. The minority of the sample falls in the category of being 50 years and above with 12% of the sample size and the majority being between 26 to 40 years of age with populating 56% of the sample size.

Table 3. Educational Qualification Analysis

Educational level	Number of board members	Percentage
GCE O/L	72	36%
GCE A/L	111	56%
Degree/Diploma or above	16	8%
Total	199	100%

As mentioned in table 3 the educational qualifications of the selected samples population are as follows. 8% of the sample population is degree or diploma holders while 36% of the sample population has qualified with GCE O/L results. The majority of the sample population according to table 3 is GCE A/L qualified board members.

Table 4. Analysis of Working Experience

Working Experience	Number of board members	Percentage
Less than one year	28	14%
one to five years	41	20%
five to ten years	65	33%
more than ten years	65	33%
Total	199	100%

According to table 4, 14% of the employees in the selected sample has worked less than one year at boards and 20% of the members have worked in the organization for 1-5 years. 33% of members have worked between 5-10 years in the board association as well as 33% of members have worker over 10 years for school boards.

Table 5. Analysis of different boards

Boards	Number of employees	Percentage
School Development Board	64	32%
Past Pupil Association	54	27%
Past teachers association	36	18%
Wellfare board	22	11%
Teaches Guide	23	12%
Total	199	100%

According to table 5 and figure 1, 32% of board members are from the School Development Board while 27% of members in the sample population are from the past pupil association. Also 18% of members belong to the past teachers association and 11% belongs to the Wellfare board while 12% belongs to the teachers guide.
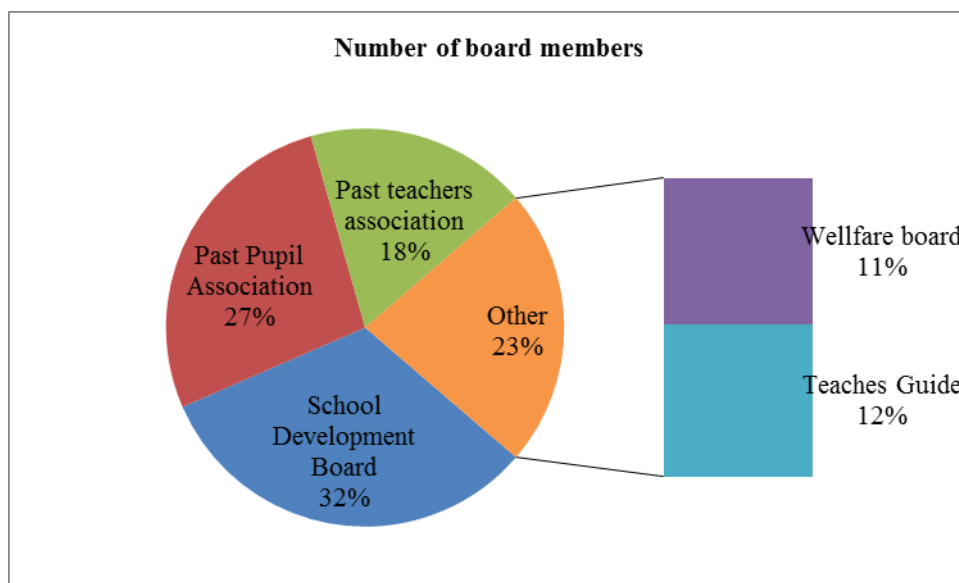

Figure 1. Analysis of different boards

3.2 Statistics and Data Analysis

Preliminary steps had been taken to ensure that only quality data were used before any statistical analysis was conducted. This will ensure that the correct findings will be produced (Sekaran & Bougie, 2013). This process

was started with the inspection of missing data and examining the data distributions of all the variables to confirm its normality and reliability.

3.2.1 Missing Data

Data screening to identify missing data or value was conducted to ensure that the data had been entered correctly. Data that were missing or wrongly entered will affect the results of the data analysis which will be carried out later. As this study was based on archival analysis, the problem of missing data can easily resolved. When the analysis of missing data was performed and the missing spot was recognized, the correct value was re-entered with the correct value or data. This was done by referring to the frequencies table for each item and variable. The correct value can be simply taken from the original score sheet of the company that had been analysed before and transferred into the statistical software used. This process was repeated until there was no missing data.

3.2.2 Normality Test

Normality tests were carried out to ensure that no extreme figures or outliers will distort the distribution of the data (Hair et al., 2006). Thus, data is considered normal when it has a symmetrical, bell shaped curve with the greatest frequencies of scores in the middle, with smaller frequencies towards either of the curve (Graveter & Wallnu, 2004; Pallant, 2010). There are several ways on how normality test was conducted include Shapiro-Wilk test, followed by the Anderson-Darling test, Lilliefors test and Kolmogorov-Smirnov, skewness and kurtosis, histogram, quantile-quantile plot (QQ plot), box-plot and stem-and-leaf plot. All these non-normal distribution data of the relevant variables were transformed so that the distribution looked more normal. The transformations used were either square root or logarithm, depending on the skewness and kurtosis level of the relevant variables. This will allow the study to proceed to use the parametric analysis techniques after the normality assumption was met (Pallant, 20l0; Tabachnik & Fidell, 2013). Other than these variables, all the remaining variables were normally distributed and met the assumption of the parametric statistical analysis. In this analysis all variables are distributed in a normal distribution.

3.2.3 Reliability Test

Reliability test was important to avoid the study from having any random error. The reliability test employed in this study was internal consistency. The most common method to measure internal consistency is the Cronbach's alpha (Pallant, 2010; Smith, 2015). It indicates the average correlation among all the items in the scale. The value ranges from 0 to 1. The higher the value, the higher the reliability of the scale (Pallant, 2010).

Table 6. Reliability Statistics

Year-2016	
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items
0.929	0.925

Based on the results summarized in Table 6, the overall value of Cronbach's alpha for this study was 0.929 in 2013 and 0.932 in 2014, indicating a higher scale reliability. Nunnally and Bernstein (1994) and Sekaran and Bougie (2013) recommended the minimum reliability values of 0.7 and 0.8 respectively for the scale to be designated as reliable. A value of 0.7 is considered satisfactory (DeVellis, 2012), while value below than 0.6 is considered a poor reliability. A value of 0.8 is preferable for most research (Pallant, 2010)

3.2.4 Assumptions of statistical analysis

Before this analysis was carried out, several assumptions needed to be met to avoid false and inaccurate inferences (Hair et al., 2006; Tabachnick & Fidell, 2013).

3.2.4.1 Sample size

Sufficient sample size is important to produce reliable statistical results (Field, 2009; Pallant, 2010). Small sample may lead to bias and wrong generalisation of the findings. The guide of the minimum sample can be based on the suggestions by Sekaran (2013), The final sample of this study was 199.

3.3 Test of Correlations

Correlation analysis is used to illustrate the strength and direction of the relationship between two variables (Pallant, 2010). The correlation values ranges from -l (perfect negative correlation) to +1 (perfect positive correlation). Negative correlation is indicated as one variable increases, the other variable decreases, while positive correlation shows that both variables increase or decrease together. The nearer the value to 1 (either positive or negative), the higher the correlation between the variables. In contrast, the value that is near to 0 indicates a weak correlation or poor relationship between the variables. This study used the Pearson product-moment correlation coefficient (Pearson, symbol - r) as the variables in this study are continuous. It can

also be used if the research had one continuous and one dichotomous variable.

Based on the correlations statistic, none of the independent variables had a correlation of more than 0.7. The highest value of correlation among the independent variables was board Charter with Web of 0.708, significant at 1% significant level. However, in terms of correlation between the independent dependent variables, the majority of the values of the correlations were less than 0.3, indicating a weak correlation value as suggested by Pallant (2010).

3.4 Testing of Hypothesis

- *H1 Hypothesis was developed to identify the relationship between board clear function and school performance*

H1o: There is no relationship between the existence of a board's clear function and school performance.

H1a: There is a relationship between the existence of a board's clear function and school performance.

Table 7. Correlations of Motivation and Descriptive Statistics

		Board's clear funtion	School performance
Board's clear funtion	Pearson Correlation	1	.
	Sig.(2-tailed)		.
	N	199	
School performance	Pearson Correlation	.603**	1
	Sig.(2-tailed)	.000	
	N	199	199

The Pearson's correlation value between Board's clear funtion and School performance is 0.603 at the significant level of 0.01. Therefore it can be identified as a positive relationship among the two variables. According to this analysis, it can be concluded that H1a hypothesis, board clear funtion has a positive relationship with School performance. Therefor the null hypothesis H1o will be rejected. The standard deviation of the independent variable which is board clear funtion a value of 0.818 which means that the data collected from the questionnaire has been divided among the mean value of board clear funtion which is 3.312. The R square value shows that the relationship between board clear funtion 36% in variation with school performance.

- *H2 Hypothesis was developed to identify the relationship between board sustainable policy and school performance*

H2o: There is no relationship between the existence of a board's sustainable policy and school performance.

H2a: There is a relationship between the existence of a board's sustainable policy and school performance.

Table 8. Correlations of Motivation and Descriptive Statistics

		Board's sustainable policy	School performance
Board's sustainable policy	Pearson Correlation	1	
	Sig.(2-tailed)		
	N	199	
School performance	Pearson Correlation	.627**	1
	Sig.(2-tailed)	.000	
	N	199	199

The Pearson's correlation value between Board sustainable policy and School performance is 0.627 at the significant level of 0.01. Therefore it can be identified as a positive relationship among the two variables. According to this analysis, it can be concluded that H2a hypothesis, board clear funtion has a positive relationship with School performance. Therefor the null hypothesis H2o will be rejected. The standard deviation of the independent variable which is board sustainable policy has a value of 0.681 which means that the data collected from the questionnaire has been divided among the mean value of sustainable policy which is 3.787. The R square value shows that the relationship between sustainable policy and school performance is 39% in variation with production efficiency

- *H3 Hypothesis was developed to identify the relationship between board charter and school performance*

H3o: There is no relationship between the board charter and school performance.

H3a: There is a relationship between the board charter and school performance.

Table 9. Correlations of Motivation and Descriptive Statistics

		Board charter	School performance
Board charter	Pearson Correlation	1	
	Sig.(2-tailed)		
	N	199	
School performance	Pearson Correlation	.708**	1
	Sig.(2-tailed)	.000	
	N	199	199

The Pearson's correlation value between Board chater and School performance is 0.627 at the significant level of 0.01. Therefore it can be identified as a positive relationship among the two variables. According to this analysis, it can be concluded that H3a hypothesis, board clear funtion has a positive relationship with School performance. Therefor the null hypothesis H3o will be rejected. The standard deviation of the independent variable which is board charter has a value of 0.481 which means that the data collected from the questionnaire has been divided among the mean value of sustainable policy which is 3.907. The R square value shows that the relationship between sustainable policy and school performance is 50% in variation with production efficiency.

3.5 Summary of the Correlations

Table 10. mmary of the Correlations

Variables	Pearson's correlation	Significance	R Square Value
Board clear funtion	0.603	0.01	0.364
Sustainable policy	0.627	0.01	0.393
Board charter	0.708	0.01	0.501

According to the analysis of the data, three positive relationships have been identified between bosrd clear function, sustainable policy and board charter with school performance. When considering the R square values, it can be understood that the variations among the independent variables has had an impact on the dependent variable. Therefor with the analysis of data gathered from the questionnaire and through the literature review, it can be concluded that motivation, line balancing and scientific workstation layout has a positive relationship with the school performance.

4. Discussion

From the data that was analysed through hypotheses testing, the relationship between the dependent and independent variables were identified. The analysis of data for independent variable board clear funtion and dependent variable school performance indicates that it has a correlation of 0.603 and the R square value of 0.364 with a 0.01 level of significance. This analysis reveals the positive relationship between board clear funtion and school performance. Therefor H1a hypothesis is accepted whereas H1o hypothesis is rejected.

From the data that was gathered from the questionnaires and the literature reviews it is evident that board clear funtion plays a vital part in the performance of schools. It also allows the school to control and minimize factors such effect into performance of the scool. After the analysis of data in relation of board sustainable policy and school performance, the correlation was indicated as 0.627 as well as the R square value as 0.393 with a 0.01 level of significance. This indicates that the relationship between the independent variable sustainable policy and dependent variable school performance is positive, which means when line balancing increases the production efficiency would increase. Therefor H2a hypothesis is accepted while H2o Hypothesis is rejected. The analysis of data from the questionnaire for independent variable board charter and dependent variable school performance, the correlation is indicated as 0.708 while the R square value is identified as 0.501 with a level of 0.01 significance. This indicates a strong positive relationship between board charter and school performance, which can be understood as when the accuracy of implementing the board charter in the boards increases the school performance. Therefor H3a hypothesis can be accepted while H3o hypothesis will be rejected. In conclusion, the research problem was analysed through the established research objectives. To initially analyse the validity of the research objectives, a literature review was developed through past research and studies that was conducted in the same area relating to school performance. A conceptual framework was then developed to further clarify the objectives in to independent and dependent variables and the established relationship among them. The dependent variable was then declared as school performance and the independent variables were declared as board clear funtion, sustainable policy and board charter.

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Research on the Influence of Firm's Innovation Driven on New Product Innovation Performance

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Abstract

New product innovation and R&D are important sources for firms to obtain competitive advantages, and market knowledge is the core element for firms to obtain new product innovation performance. However, it can be also found out that the relevant discussion upon innovation has been still limited to restricted theories and the developing empirical researching area by reviewing the literature. Based on knowledge-based theory, a questionnaire survey of 220 high-technology and internet firms in China was conducted to empirically analyze the relationship between innovation driven, potential absorptive capacity, and new product innovation performance. The study found that: the potential absorptive capacity mediates the relationship between market orientation and new product performance, technological opportunity and new product performance, and the potential absorptive capability positively adjusts the relationship between technological opportunities and realized absorptive capacity. It is possible to understand more clearly the process of firms acquiring and digesting information, transforming and mining knowledge to achieve new product innovation performance by analyzing the process of knowledge absorption and conversion.

Keywords: market orientation, technological opportunity, potential absorptive capacity, realized absorptive capacity, new product innovation performance

1. Introduction

In the era of knowledge economy, with the market competition becoming gradually more and more intense, firms that facing the dynamic, complicated and highly uncertain competition environment shall take the continuous innovation as the responding strategy for survival and development in order to maintain the advantageous competition capacity (Porter, 1980). Innovation is indeed the essential method for the development of a firm, an industry or even a country.

When it comes to the managers of an firm, however, it is just the task he is faced with and is to deal with that how to improve effectively the firm's performance, to give response to the target market more rapidly, to create new products or valuable services for customers, and to obtain the firm's advantage in competition (Ryzhkova & PesÄMaa, 2015). With the development of Chinese economy, especially after entering WTO, the connection between domestic market and international market has been more and more enclosed. As a result, Chinese firms are facing both the new competition in domestic market and new challenge in globalized market. According to the authoritative data from National Development and Reform Commission of China, around 150,000 firms are born in China every year while annually about 100,000 come to death; almost 60% bankrupt within 5 years while 85% in 10 years; more impressively, private firms share a 2.4-year-old life on average. It is just because of the rapid changing of the market and the progress in technology that the amount of competitors from different industries and different areas is becoming larger and larger. While with the shortening of the life cycle of products, firms must have the ability to respond more quickly to grasp the opportunity brought about by technological development, which is the necessity to ensure their survival in the highly competitive environment. The firm invested huge resources in the new products to gain competitive advantage; the new product becomes the core of competitive advantage. Developing new products with unique benefits is crucial for firms to increase profits (Langerak, Hultink, & Robben, 2004; Li & Calantone, 1998).

It was claimed by Slater and Narver (1994) that innovation, which would mostly come from market orientation, was "ability of core value creation", and that market orientation meant to establish the competitive advantage through attaching importance to customers and creating the comparatively better customer value (Narver & Slater, 1990). However, the process from information to the innovation performance cannot be accomplished directly; Information must be digested, absorbed and translated into useful knowledge. It can be especially seen in the firms under the higher market orientation and more technological opportunity, which shall cultivate their capacity of knowledge translation in their process of realizing the innovation. They shall transform the market information and technological information obtained into the valuable knowledge for the development of firms through filtering, absorption and digestion in order to make the correct decision and to reach the innovation performance and competitive advantage (Stefania & Małgorzata, 2015; Zahra & George, 2002). Thus, this research takes the market orientation and technological opportunity as the Innovation-driven factors (Dosi, 1988), and raises the point that knowledge translation capacity must be embodied in the firm as the mediating factor.

2. Literature Review and Research Hypotheses

Knowledge itself is a part of the firm's resources, and in management science, the concept of knowledge economy was raised by Drucker (1969) which emphasized that the world economy was gradually motivated by the production, separation and usage of knowledge, and knowledge, regarded by him, was the one and only source of firm's obtaining the competitive advantage (Drucker, 2014).

It is pointed out by Knowledge-based view that knowledge is the most important resource and is of the highest strategic significance, and it is revealed that the fundamental cause of diversity of performance among firms is the diversity of knowledge base (Grant, 1996).

Different types and quantities of knowledge possessed by each firm are different, and there is a significant difference in the knowledge base formed thereby, which brings about the uniqueness of the firm, the difference in performance between firms, and the possibility of the firm's continued success. Extant research considers market knowledge is the main driver of product innovation performance (Atuahene-Gima, 1995; Atuahene-Gima *et al*., 2005). Firms can use and integrate knowledge resources to promote the performance of firm product innovation (Li & Tsai, 2011).

This study takes the knowledge as the one and only source for firm to obtain the competitive advantage (Drucker, 2014), and takes the innovation-driven factors as the source of knowledge. In the research field of Resource-based theory, the rich research results in the Knowledge-based theory will provide a strong theoretical basis for this study.

2.1 Market Orientation, Realized Absorptive Capacity and New Product Innovation Performance

The main difference between a firm and its competitors comes from knowledge resources (Grant, 1996). Knowledge resource refers to the internal ability of the firm to be creative, unique, difficult to imitate, and the market knowledge is the most important above all (Luca & Atuahene-Gima, 2007). Market knowledge refers to the knowledge of the customer and competitor that the firm has (Day, 1994; Kohli & Jaworski, 1990; Narver & Slater, 1990). Market orientation plays an important role in a firm's ability to generate, disseminate and use better information about its customers and competitors (Kohli & Jaworski, 1990). Firms of high market orientation will take the initiative to meet changing customer preferences, understand customer needs, and find the shortage of firm's ability or the emerging market opportunity, so as to develop the necessary ability. By analyzing the environment, it can create value for customers, and through the development of new products or services, it can promote its performance (Mohr, Sengupta, & Slater, 2010). In this study, it is held that the more market information the organization has, the more it can promote the organization in cultivation of absorptive capacity and improve the competitive advantage of the firm.

First of all, according to the Knowledge-based theory, Grant (1996) proposed that knowledge is very important, but knowledge is not important in knowledge itself, but the mechanism of knowledge integration, indicating that knowledge integration is the source of competitive advantage. Therefore, knowledge itself is not too important, while the source of firm innovation performance is to acquire, assimilate, transform and exploit the knowledge through absorptive capacity. When an firm comes into contact with knowledge, it will influence the decision making of the firm (March & Simon, 1993) and the development of the future ability (McGrath & MacMillan, 1995). To the firm, market knowledge is the firm's first contact, and it can understand the current market situation, such as customers, suppliers, competitors and government departments. The diversity, width and depth of the knowledge will affect the firm knowledge acquisition. The more market information a firm has, the more it will increase the willingness of the organization to assimilate the information. Because the more market

information means the more the firm can grasp about customer needs and competitors behavior; therefore, in order to seize the opportunity, firms will increase the tendency to digest the information, trying to put these information combined with the firm's strengths and weaknesses, to produce a unique knowledge (Mcdonald & Madhavaram, 2007). That is to say, the more market knowledge the firm has, the more it tends to assimilate the related information, the more it would need to develop the ability of knowledge acquisition, absorption, digestion and application of new knowledge, namely the absorptive capacity, and absorptive capacity is necessary for the firm to improve long-term performance (Day, 1994).

Finally, the absorptive capacity of the firm is always interacting between new knowledge and the existing knowledge in order to realize the development and promotion of product. The effective acquisition and use of external knowledge affect the formation and accumulation of absorptive capacity (Kotabe *et al*., 2011). The organization's absorptive capacity of external knowledge is an important factor in determining innovation performance (Cohen & Levinthal, 1990). The higher the absorptive capacity of the department or organization is, the stronger the ability is to master the information and environment of the firm, the better the ability is to identify the useful knowledge and apply it to the innovation, and the higher the performance of organizational innovation will be (Szulanski, 1996). The higher the absorptive capacity of the firm is, the better the ability is to master the information and the external environment, the better the ability is to identify the useful knowledge, and to absorb to create the valuable firm performance (Ahimbisibwe *et al.,* 2016; Stefania & Małgorzata, 2015). Based on the above discussion, the first hypothesis of this study as follows.

H1: Realized absorptive capacity mediates the relationship between market orientation and new product innovation performance.

2.2 Technological opportunity, Realized Absorptive Capacity and New Product Innovation Performance

A firm who is eager to has competitive advantage in the industry not only needs to have and control the rare and valuable resources, but also needs the integration mechanism within the firm to conduct the knowledge assimilation, transformation and application in order to provide new products and services for the customer, and then to gain a competitive advantage (Barney, 1991; Grant, 1996; Teece, 2007). In addition to market information, technological opportunity is another important factor in this study.

The firm shall has the ability to perceive the technology development and respond accordingly, which can improve the competitive advantage of firm (Srinivasan, Lilien, & Rangaswamy, 2002). With more technology choices, firms have more opportunity to obtain competitive advantage through technological innovation. More technological opportunity means more external information and obtainable external technological knowledge, and the emergence of new technologies opens the door for product innovation; at the same time, these large technological information will become the motivation to promote the firm absorptive capacity (Lichtenthaler, 2016). The learning environment being more challenging can increase R & D investment to cultivate the absorptive capacity of the firm. In the environment of low technological opportunity, with the lack of diversity for firm to seek knowledge, and the knowledge obtained is limited, optional possibility for team members will be greatly reduced, the willingness of employees to engage in the information conversion and exploration, in comparison with high technological opportunity, will be relatively low. In this case, the team members may rely on the familiar knowledge and the old, existing method to develop new products. As a result, the members will not have much desire to absorb external technological information.

Firms realize that they need to grasp the existing knowledge and technology to develop new products and create benefits to gain a competitive advantage (Bavarsad, Kayedian, Mansouri, & Yavari, 2014). The specific technological environment provide team members with unexplored areas, and the possibility of the new development and utilization of knowledge, which produces a breakthrough innovation (Ahuja & Lampert, 2001), resulting in innovation performance. The stronger absorptive capacity of firm has, the more technological information it can collect. Dissemination of information and response to market demand are conducted, and the new product development performance gets higher. Thus, the whole firm innovation performance gets also higher (Lichtenthaler, 2009). Therefore, this study proposes the second hypothesis as follows.

H2: Realized absorptive capacity mediates the relationship between technological opportunity and new product innovation performance.

2.3 The Moderating Effect of Potential Absorptive Capacity on the Relationship between Market Orientation and Realized Absorptive Capacity

Potential absorptive capacity refers to the ability of a firm to discover, acquire, and absorb knowledge. The stronger the potential absorptive capacity, the more firms are willing to absorb external knowledge. Under the

circumstances the information about the market and competitors is constantly changing, the more market-oriented firms have, the more they can grasp potential needs of customers now and in the future. It also prompts firms to increase their tendency to digest market information, conduct information screening and transformation, convert customer and competitor information into valuable knowledge and cooperate with the firm's own advantages to improve new product innovation performance. The combination of high market connection capacity and high potential absorptive capacity can enhance the digestion of knowledge by firms and translate them into the ability of the firm to improve the performance of the firm. On the contrary, if the potential absorptive capacity is low, it means that the firm's ability to accept external knowledge within a certain period of time is not strong. At this time, although the firm has market orientation, the team members will not take the initiative to acquire knowledge and will reduce the number of members. The motivation for digesting this information, or even acquiring knowledge, cannot absorb and transform this market information into more useful knowledge. Therefore, this study proposes hypothesis 3.

H3: Potential absorptive capacity plays a positive regulatory effect on the relationship between market orientation and potential absorptive capacity.

2.4 The Moderating Effect of Potential Absorptive Capacity on the Relationship between Technological Opportunity and Realized Absorptive Capacity

The potential absorptive capacity reflects the ability of a firm to acquire and absorb external information and reflects the sensitivity of the organization to knowledge. Technological opportunity are the number managers perceive outside related technical knowledge and can continue to increase opportunity for R&D investment related to this technology. The firm's investment in R&D not only generates new knowledge, but also helps to increase absorptive capacity, thereby creating innovation and gaining competitive advantage.

The stronger the firm's potential absorptive capacity, it will actively perceive the changes in the external market, especially the changes in technological opportunity. The more the firm can understand the current or future needs and actions of competitors or customers, the more the firm can make predictions on the development trend of the industry, grasp opportunity and encourage firms to filter and digest technology-related information, thereby transforming it into useful knowledge and fostering the firm's technological superiority. Technical knowledge refers not only to knowledge related to technological progress, but also to competitors' information (Tödtling, Lehner, & Kaufmann, 2009); and the lower the firm's potential absorptive capacity, the organization will not actively seek changes in the external environment, the response of the demand is not obvious. At this time, even if the firm has technical opportunity, there is no potential need for the firm to pull; firms do not have more motivation to digest this information and are less motivated to digest and convert knowledge. As a result, there is less opportunity for new product innovation.

In summary, the stronger potential absorptive ability of firms will encourage firms to obtain better technical information, learn more technologies or gain more opportunity. The team members will be more likely to pay attention to the current technological opportunity, and the more technical selectivity, more likely the team members are to absorb foreign technical knowledge. On the other hand, in order to meet the rapid changes in technology, to win in the competition, firms will increase R & D investment, enhance their own realized absorption capacity, and convert useful knowledge into new products. However, in the environment where the potential absorptive ability of the firm is low, the firms are unresponsive to the external. Even if the firm has the technological opportunity, the motivation of the firm to improve the realized absorptive capacity is not strong enough to convert the market knowledge into new products. Based on the above discussion, this study proposes hypothesis 4.

H4: Potential absorptive capacity plays a positive regulatory effect on the relationship between technological opportunity and absorptive capacity. The research framework is shown in Figure 1.
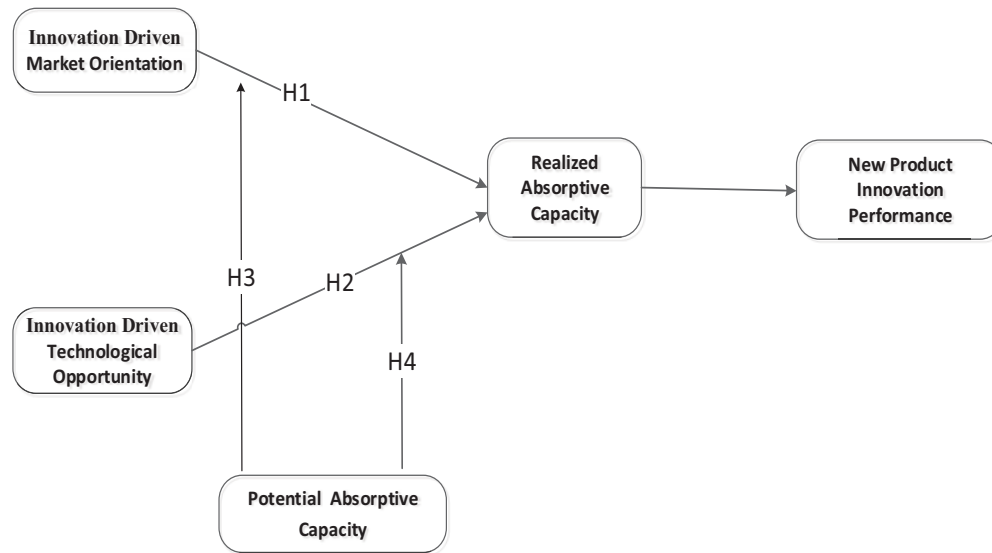
Figure 1. Research Framework

3. Method

3.1 Samples and Data Collection

This dissertation focuses on the relationship between innovation-driven, realized absorptive capacity and new product innovation performance in new product innovation. We followed the suggestions from earlier studies conducted in new product innovation (Atuahene-Gima & Wei, 2011; Luca & Atuahene-Gima, 2007; Catherine L. Wang & Rafiq, 2014). Firstly, this study will focus on the high-technology industry , because the rewards of new products appear more spectacular in the hi-tech sector (Song & Parry, 1997). Secondly, this study will focus on Internet firms. In recent years, the scale of China's Internet transactions has maintained a rapid growth rate.

In this paper, high-tech firms and Internet firms in Beijing and Shandong Province as research object, from March 2017 to May 2017, a total of 300 questionnaires were distributed, 230 questionnaires were returned, and a total of 220 valid questionnaires were obtained after removing invalid questionnaire. The recovery rate and the valid recovery rate of questionnaires were 77% and 73%. The basic characteristics of the sample are shown in Table 1.

Table 1. Sample Characteristics

Scale	Below 100 persons	26%	Stage	Founding period	13%
	100-500	43%		Growth period	59%
	500-1000	26%		Mature period	24%
	Above 1000	5%		Recession	4%
Time	Below 1 year	5%	Business	High-Tech Firms	63%
	1-5 year	21%		Electric business firms	23%
	5-10 year	42%		manufacturing	7%
	Above 10 year	32%		Wholesale and retail	7%

3.2 Variable Measurement and Verification

Reliability and Validity analysis is used to test the questionnaire scale whether it has the stability and consistency in the measurement of latent variables. This study mainly used the Cronbach's α test; the greater the value is, the internal consistency of the questionnaire items is higher, and the Cronbach's α value should be higher than 0.70 (Nunnally & Bernstein, 1994).

Validity analysis is used to measure scale questions, including content validity and construct validity. The questionnaires in this study mainly come from the widely cited mature scale, which is revised according to the opinions of experts and scholars; therefore, the questionnaire designed in this article has a high content validity.

Confirmatory factor analysis was used to test the convergent validity and discriminate validity of the scale.

3.2.1 Reliability Test

The Cronbach's α coefficient; AVE, CR, and Factor Loading of each construct were calculated by software. Cronbach's α of five variables is between .837 and .931, indicating that the scale has good internal consistency. The CR value of each construct is similar to α, and CR>0.7, so the questionnaire has good internal consistency and satisfies reliability requirements. χ^2/DF is less than 5, NFI, NNFI, CFI, IFI, and RFI all meet the requirement of greater than 0.9, RMR satisfies the requirement of less than 0.1, and SRMR satisfies the requirement of less than 0.08, so the questionnaire satisfies the validity requirement.

3.2.2 Validity Test

The validity and the discriminant validity were verified by Amos and summarized in Table 2.

Table 2. Summary table of correlation coefficients

	MO	TO	PACAP	RACAP	NPIP	TIME	STAGE	SCALE
1	0.55							
2	0.67	0.66						
3	0.61**	0.57**	0.65					
4	0.73**	0.53**	0.52**	0.58				
5	0.59**	0.53**	0.57**	0.43***	.54			
Mean	4.06	3.80	3.90	4.04	3.99	3.94	4.51	3.09
SD	0.51	0.54	0.56	0.55	0.68	0.44	15.1	1.47

Note. N=220；* $p<.05$；**$p<.01$；***$p<.001$.

MO: Market Orientation PACAP: Potential absorptive capacity RACAP: Realized Absorptive Capacity NPIP: New Product Innovation Performance TO: Technological Opportunity

4. Results

The paper adopts Hierarchical Multiple Regression analysis to analyze the mediating role of realized absorptive capacity and the moderating role of potential absorptive capacity by using spss19 and Amos21.

4.1 The Mediating Role of Realized Absorptive Capacity played between Market Orientation and New Product Innovation Performance

When analyzing the mediation effects of potential absorptive capacity on market orientation and new product innovation performance, three-step regression process will be used to test the mediation role of realized absorptive capacity (Baron & Kenny, 1986). Meanwhile, three regression models will be established. In model 1, the independent variables are 3 control variables; firm establish time, firm scale and firm stage as well as market orientation, while the dependent variable is new product innovation performance. This model aims at studying the effects of these control variables and market orientation on new product innovation performance. In model 2, the independent variables are 3 control variables, firm establish time, firm scale and firm stage, as well as market orientation, while the dependent variable is realized absorptive capacity. This model aims at studying the effects of these control variables and market orientation on the realized absorptive capacity. In model 3, realized absorptive capacity is added based on model 1. In other words, model 3 is a full model containing all the control variables, market orientation, and realized absorptive capacity. Table 3 shows the regression operating results about mediation effects of realized absorptive capacity on market orientation and new product innovation performance.

Table 3. Results for Mediated Regression Analysis

Variables	Criterion RACAP Model 2		Criterion New Product Innovation Performance Model 1		Model 3	
	ß	t value	ß	t value	ß	t value
TIME	.007	.13	.06	.735	.05	.80
STAGE	-.05	-.78	-.15	-1.75	-.12	-1.58
SCALE	-.002	-.135	.04	1.40	.04	1.76
MO	.78	11.34***	.79	8.11***	.18	1.52
RACAP					.78	7.06***
F value	32.38***		17.59***		30.02***	
R²	0.51		.38		.55	
ΔR²					0.17	
F change					49.82***	

*p<0.05 **p<0.01 ***p<0.001

Note. This study used a two-tailed test for control variables and a one-tailed test for all hypotheses.

In Model 1, we use regression analysis to test the direct influence of market orientation on new product innovation performance. The results show that market orientation has a significant positive impact on new product innovation performance (ß = 0.79, p < 0.001). In addition, Model 2 suggests that market orientation has a positive effect on potential absorptive capacity (ß = 0.78, p < 0.001). Finally, when realized absorptive capacity was added to Model 3, it showed a positive and significant effect on new product innovation performance (ß = 0.78, p < 0.001).

From the analysis results, with the addition of realized absorptive capacity, the influence of market-oriented ability on new product innovation performance is reduced (from 0.79 to 0.18), but not significant, indicating that it is a complete intermediary, which explains the influence of market orientation on new product innovation performance is through realized absorptive capacity, we can transform the collected market information into knowledge and apply it to the development of new products to improve the performance of new product innovation. We further conducted a validation test based on the Sobel mediation process and found that market orientation has a positive effect on new product innovation performance through realized absorptive capacity. The direct impact is 0.61 (0.78 * 0.78, t = 6.08, p < 0.01) (Hayes, 2013; Sobel, 1982). Therefore, Hypothesis H1 is supported.

4.2 The Mediating Role of Realized Absorptive Capacity played between Technological Opportunity and New Product Innovation Performance

When analyzing the mediation effects of realized absorptive capacity on technological opportunity and new product innovation performance, three-step regression process will be used to test the mediation role of realized absorptive capacity (Baron & Kenny, 1986). Meanwhile, three regression models will be established. In model 1, the independent variables are 3 control variables; firm establish time, firm scale and firm stage, as well as technological opportunity, while the dependent variable is new product innovation performance. This model aims at studying the effects of these control variables and technological opportunity on new product innovation performance. In model 2, the independent variables are 3 control variables, firm establish time, firm scale and firm stage, as well as technological opportunity, while the dependent variable is realized absorptive capacity. This model aims at studying the effects of these control variables and technological opportunity on realized absorptive capacity. In model 3, absorptive capacity is added based on model 1. In other words, model 3 is a full model containing all the control variables, technological opportunity, and realized absorptive capacity. Table 4 shows the regression operating results about mediation effects of realized absorptive capacity on technological opportunity and new product innovation performance.

Table 4. Results for Mediated Regression Analysis

Variables	Criterion RACAP		Criterion New Product Innovation Performance			
	Model 2		Model 1		Model 3	
	ß	t value	ß	t value	ß	t value
TIME	-.05	-.84	-.02	-.27	.02	.31
STAGE	.04	.48	-.04	-.49	-.07	-.99
SCALE	-.03	-1.13	.004	.15	.02	1.05
TO	.42	6.92***	.58	8.38***	.29	4.38***
RACAP					.71	8.31***
F value	12.12***		18.74***		37.67***	
R²	.27		.38		.61	
ΔR²					0.22	
F change					69.04***	

*p<0.05   **p<0.01   ***p<0.001

Note. This study used a two-tailed test for control variables and a one-tailed test for all hypotheses.

In Model 1, we use regression analysis to test the direct impact of technological opportunity on new product innovation performance. The results show that the technological opportunity has a significant positive impact on new product innovation performance (ß = 0. 58, p <0.001). In addition, Model 2 suggests that technological opportunity has a positive effect on realized absorptive capacity (ß = 0.37, p <0.001). Finally, when absorptive capacity was added to Model 3, it showed a positive and significant effect on the innovation performance of new products (ß = 0.68, p <0.001).

It can also be seen from the analysis results that with the addition of realized absorptive capacity, the influence of technological opportunity on new product innovation performance is reduced (from 0.58 to 0.29). However, it is still significant, indicating that it is a partial intermediary, which shows that the influence of technological opportunity on the new products innovation performance has two effects. One is the direct relationship between the two, and the other is the influence of technological opportunity on new product innovation performance is partly through realized absorptive capacity, which help the firm collect technological information and transformed them into knowledge, apply to new product development, and thus improve the performance of new product innovation. We further conducted a confirmatory test based on the Sobel mediation process and found that technological opportunity has a positive effect on new product innovation performance through absorptive capacity. The indirect effect is 0.30 (0.42 * 0.71, t = 4.35, p < 0.01) (Hayes, 2013; Sobel, 1982). Therefore, hypothesis H2 is supported.

4.3 Moderation Effects of Potential Absorptive Capacity on the Market Orientation and Absorptive Capacity

A series of models established in this study based on the assumption of regulatory variables include: Model 1 consists of three control variables: firm establish time, firm scale and firm stage. Model 2 add market orientation and potential absorptive capacity based on model 1. Model 3 composed of elements in model 2, as well as the product item of market orientation and absorptive capacity. Table 5 shows the regression results of potential absorptive capacity as a moderator.

Table 5. Results for Hierarchical Moderated Regression Analysis

Variables	Model 1		Model 2		Model 3		VIF
	ß	t value	ß	t value	ß	t value	
TIME	-.02	-.26	.02	.39	.02	.44	1.593
STAGE	-.03	-.33	-.003	-.07	-.01	-.18	1.483
SCALE	-.001	-.04	-.02	-.94	-.05	-.88	1.161
MO			.48	6.45***	.48	6.45	1.610
PACAP			.44	6.42***	.46	6.29	1.870
MO_X_PACAP					.05	.79	1.267
F value	0.14		43.18***		35.97		
R²	-.022		.65		.65		
ΔR			0.66		-0.001		
F change			41.17***		.63		

*p<0.05,   **p<0.01，   ***p<0.001

Note. This study used a two-tailed test for control variables and a one-tailed test for all hypotheses.

In Table 5, all the coefficients of the variance inflation factor (VIF) are estimated to be lower than 10 (Mason & Perreault Jr., 1991), which indicating that de-centralizing of the variables has no effect on the operating results.

Model 1 shows that when explaining realized absorptive capacity, the control variable can explain -2.2% for the variance. Model 2 shows that R² increased by 66.1% (∆F = 41.166, p < 0.001) after adding independent variables (market orientation) and moderation variables (potential absorptive capacity). As we mentioned above, market orientation has a significant and positive effect on Absorptive Capacity (ß= 0.44, p < 0.001).

Model 2 also shows that potential absorptive capacity has significant and positive effect on absorptive capacity (ß= 0.48, p < 0.001), which means that the stronger the potential absorptive capacity outside, the more conducive for the firm to increase their potential absorptive capacity.

In Model 3, we added the regression equation of market orientation and potential absorptive capacity interaction terms to adjust the effects of market orientation on realized absorptive capacity, R² decreased by 0.1% (∆F = 0.63, p >0.05). This result shows that the influence of market orientation on realized absorptive capacity is not affected by the potential absorptive capacity. Hypothesis H3 is not supported.

4.4 Moderation Effects of Potential Absorptive Capacity on the Technological Opportunity and Realized Absorptive Capacity

In this work, a series of models are established based on the hypothesis of moderate variables: Model 1 is composed of 3 control variables: firm establish time, firm scale and firm stage; model 2 added independent variables technological opportunity and the regulatory variables potential absorptive Capacity; Model 3 composed of elements in model 2, as well as the product item of technological opportunity and potential absorptive capacity. Table 6 shows the regression results of potential absorptive capacity as a moderation variable.

Table 6. Results for Hierarchical Moderated Regression Analysis

Variables	Model 1		Model 2		Model 3		VIF
	ß	t value	ß	t value	ß	t value	
TIME	-.02	-.26	-.003	-.06	.007	.14	1.63
STAGE	-.03	-.33	.05	.74	.05	.88	1.46
SCALE	-.001	-.04	-.03	-1.50	-.03	-1.72	1.18
TO			.15	2.45***	.14	2.31	1.57
PACAP			.61	8.06***	.57	7.56***	1.60
TO_X_PACAP					-.12	-2.06*	1.16
F value	.140		28.08***		24.77***		
R²	-.022		.532		.55		
∆R			0.554		0.04		
F change			64.96***		4.24		

*p<0.05, **p<0.01，***p<0.001

Note. This study used a two-tailed test for control variables and a one-tailed test for all hypotheses.

In Table 6, all the coefficients of the variance inflation factor (VIF) are estimated to be lower than 10 (Mason & Perreault, 1991), which indicating that de-centralizing of the variables has no effect on the operating results. Model 1 shows that when explaining potential absorptive capacity, the control variable can explain -2.2% for the variance. Model 2 shows that R² increased by 55.4% (∆F = 64.69, p <0.001) after adding independent variables (technological opportunity) and moderation variables (potential absorptive capacity). As we mentioned above, technological opportunity has a significant and positive effect on potential absorptive capacity (ß = 0.15, p <0.001).

Model 2 also shows that potential absorptive capacity has significant and positive effect on realized absorptive capacity (ß = 0.11, p <0.01), which means that firm's increased strength and emphasis on potential absorptive capacity will help improve the firm's potential absorptive capacity..

In Model 3, we added the regression equation of technological opportunity and realized absorptive capacity interaction terms to adjust the effects of technological opportunity on realized absorptive capacity, R² increased by 1.3% (∆F = 4.239 p< 0.05). One-tailed tests are often used to verify the hypothesis of the direction of the forecast, the effect of technological opportunity and potential absorptive capacity on the realized absorptive capacity is significant (ß = - 0.12, t = -2.06, p <0.05). With stronger potential absorptive capacity, there is a negative relationship between technological opportunity and potential absorptive (β = 0.07, t = 0.99, p <0.01) .When potential absorptive capacity is lower, there is a positive relationship between technological opportunity and potential absorptive capacity (β = 0.21, t = 3, p <0.01).

This result shows that potential absorptive capacity has a significant effect on technological opportunity and realized absorptive capacity relative lower potential absorptive capacity. Therefore, hypothesis H4 is supported.

5. Discussion and Conclusions

In extant research, there is a relative lack on the formation of absorptive capacity and internal change mechanisms, and there are still differences in the function path of absorptive capacity on new product innovation performance. This dissertation, taking the framework of Zahra and George (2002) as the theoretical basis, and the innovation-driven factors as the knowledge sources, has validated the view that knowledge is the main source for the firm to obtain the new product innovation performance in order to obtain the competitive advantage. Based on this, the empirical verification of the framework has been made. Simultaneously, it was pointed out by Dosi (1988) that the innovation of the firm comes from mainly the demand pull and technology push, while Day (1994) also raised that firms motivated by market could present the high market sensemaking capacity, which could become the guidance for it to obtain the ability of connection of internal and external areas, for instance the firm's absorptive capacity.

This study empirically explores the process of innovation-driven, realized absorptive capacity and new product innovation performance. In the process of transforming external knowledge into new product innovation performance, it is not enough to merely acquire and absorb external information. Only the information can be converted into useful knowledge that can be utilized by the team members or organizations, that is realized absorption capacity, which may be helpful for new product development. In the relationship between market orientation and potential absorptive capacity, the moderator of potential absorptive capacity has not played a corresponding role. With higher market orientation and the firm will has more market knowledge, the firm can directly apply the acquired market information. However, with the increase of technological opportunities, potential absorption capacity plays a negative regulatory role between technological opportunities and potential absorptive capacity.

Absorptive capacity can promote the new product development performance, which has been widely accepted by academic circles. This study supports this conclusion and provides some implications for managers in the following aspects.

Firstly, firm managers must pay attention to market knowledge, grasp the market conditions, pay attention to the changes of customers and competitors, and constantly obtain the information needed by enterprises in order to win in the market competition and obtain competitive advantages. Secondly, firm should cultivate the learning ability and enterprise's perception of external information and knowledge, so that enterprises can perceive and grasp the development pulse of new knowledge and new technologies, screen information, and absorb useful information, which in turn translates into useful knowledge; at the same time, only information can be absorbed, converted into useful knowledge and used by group members or individuals to promote product performance. Therefore, firms should create a relaxed, positive learning environment to promote the absorption and transformation of external knowledge for employees. For the acquired new technologies and knowledge, managers should organize experts to learn and digest new knowledge, organize internal learning, and translate into useful knowledge for the firm to improve new product innovation performance.

There are several limitations in the process of elaborating the results. First of all, the data are mainly from China, and the sample data are mainly from Beijing and Shandong Province. Therefore, the universality of the results is limited. Secondly, although some variables, such as firm time, firm stage and firm scale were controlled, they did not include some potential influence factors such as R&D input intensity that were widely considered in previous studies (Li & Calantone, 1998). In the future research, these contents can be further studied. Lastly, sample data used in this study was cross-sectional data. Future research can target a certain amount of firm sample data and select longitudinal data with a certain time span to further discuss, and dynamically explain the evolution mechanism of potential absorptive capacity, realized absorptive capacity and its impact on new product innovation performance.

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Predictors of Branding and the Role of Warranty on Consumer Choice

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Abstract

This conceptual paper reviews the literature from three distinct areas in consumer behavior: branding, warranty, and choice. In using a mixture of these three areas, propositions are developed which will be tested in future research. The impact of this study is geared towards understanding the behavior of consumers purchasing high cost items and the relative importance and trust that is placed in the warranty that comes with such a purchase. While the study will consider domestic (United States) consumers, international factors such as country of origin and psychic distance will be posed as viable factors in the decision making process. We propose that six factors will impact the role of branding in the decision making process and that a warranty will serve as a moderator to the ultimate choice decision.

Keywords: branding, warranty, consumer behavior, country of origin, psychic distance

1. Introduction

A common expression in business is that a warranty is only as good as the company's reputation that stands behind it. Everyday consumers purchasing everyday goods probably don't think much about warranties when making a grocery store or pharmacy run, but when it comes to large-scale purchases like automobiles, appliances, televisions, and other big ticket items, a warranty can become a make-or-break factor in the decision-making process. In fact, warranties have become competitive advantages to some firms (Xie, 2017). Various brands offer similar warranties in terms of length, coverage, and quality. The purpose of this research is to examine predictors of branding and the role of a warranty on purchase decisions. The paper proceeds as follows. To begin, a literature review is conducted on branding, warranty, and choice theory. Propositions to be tested in a forthcoming empirical study will be posited throughout this literature review. Next, a discussion of additional branding factors and their corresponding literature is examined, and further propositions are posited. These additional factors include reputation, national exposure, country of origin, emotional appeal, ease of product recall, and psychic distance. Following this section, some frameworks are proposed based on the theory developed throughout this conceptual paper. Finally, some managerial implications and conclusions are discussed.

2. Literature Review

2.1 Branding

"If a company is able to make a consumer look at a certain product for a fraction of a second longer than its competitors' products, the probability of purchase intent increases significantly (Sandom 2008)." A recent New York Times article describing people's frustration with advertisements being everywhere cite a study done by Yankelovich, Inc., a market research firm, which has claimed that 30 years ago, people living in a city would see up to 2,000 advertisements in one day. That figure has more than doubled in today's marketplace; city dwellers can be exposed to up to 5,000 advertisements daily (Story, 2007)! While there is no need for an agreement on the actual number of ads an individual is exposed to on a given day, it can be agreed that the amount of advertising a person is exposed to in a short amount of time can be staggering. Advertising is a method used by companies which attempts to gain name recognition and credibility in the market (Petty, Cacioppo, & Schumann, 1983). Advertising is a portion of the study of branding, which has been given considerable attention in consumer behavior research for the past half-century or more. In a recent 2008 article which examines the "laws of branding", T.H. Walvis defined branding as "the activity by brand owners of associating the brand name with those pieces of information, meanings, emotions, images, and intentions that are of key importance in the

decision-making process of customers and of stakeholders in general" (Walvis, 2008). Each year, the American Brands Council publishes a volume which describes America's greatest brands insomuch as they provide the consumer with an "intrinsic, emotional link". This link is what creates in the consumer the loyalty towards that brand and keeps a person coming back again and again to that product or firm (American Brand Council, 2010). Thus, corporations wishing to establish and maintain a positive and on-going relationship with their customers need to employ a branding strategy that aligns with their business model and appeals to the emotions and habits of their target market. The following subsections discuss a few aspects of branding which will be utilized in building the theoretical framework for this study.

2.1.1 Attitude Toward the Brand and Brand Association

Risk adverse consumers, especially when buying high-cost and high-importance items, will be more likely to stick to longstanding and reputable brand names when given the choice between something new and something trusted (Tversky & Kahneman, 1986). Thus, new entrants go great lengths to pump the consumer pool with advertisements and information about their products, and many times, their warranty, which will back up the message they are communicating. They do this to establish a positive attitude towards the brand, and ultimately influence the consumer decision (Mitchell & Olson, 1981). Thus, branding can be thought of as an activity which is aimed at increasing the likelihood that a brand is chosen by a customer (Walvis, 2008). In a sense, brands compete with each other for recognition and for position in the consumer's brain.

Corporations across the globe use their corporate brand to gain instant recognition and association of its reputation and goodwill in the consumer's eyes (Rooney, 1995). Such reputations are typically built over a considerable time period, and often times a major stumbling block for new brands is that customers have reluctance to something new and unknown. Marketing research has demonstrated that an organization's reputation will affect a consumer's product choice, intentions for purchases, and overall attitude towards the brand (Hess, 2008; Johnson & Grayson, 2005). Consumers use their attitudes, persistent outlooks on a given stimuli, to organize their thoughts about the product or service or to retrieve associated thoughts and feelings about the brand. Marketers use brand associations and attitudes to differentiate product offerings, create positive word of mouth, and to promote the attributes of a specific product offering (Aaker, 1991). For example, Hyundai motors, in the last several years, has shifted its product offering from a base-model company to now one that includes luxury features and attributes on the level of other mid-range automobiles such as Honda, Chrysler, and Volkswagen. The company has made an effort to re-position itself in the market, and thus, consumers' attitude towards the brand has shifted. However, whether or not consumers are aware of this shift can play a major role in their choice decision. There has been vast empirical research which has shown that brand associations differ across product categories (Low & Lamb, 2000). This may be due to attributes of the product, their costs, the customer's involvement, or even some of the dimensions identified by Hofstede such as long-term orientation or collectivism (Hofstede, 1991). One of the most vivid examples of brand association would be Wal-Mart and its association with low price. If a consumer's brand association does not accurately assess the company's offering or position, marketing managers need to make efforts to revise the association.

2.1.2 Perception of the Brand

Perception by the consumer is another piece of the branding effort which must be understood to grasp the importance of branding for a firm. Perceived quality is defined as the consumer's judgment about a product's overall excellence or superiority (Aaker & Jacobson, 1994; Zeithaml, 1988). Strong brands add value to consumers' purchase evaluations. In a relevant study, Sethuraman and Cole illustrated that perceived quality "explains a considerable portion of the variance in the price premium consumers are willing to pay for brands" (Sethuraman & Cole, 1997). For example, Volkswagen's quality may be perceived as very high since it is a Germany company and many other high quality automobile makers originate there. In addition, German manufacturing has a perceived high level of manufacturing know-how and the country, in general, employs the highest quality standards in the world. These factors may have a significant impact on the perceived quality offering by Volkswagen. This phenomenon is also part of the Country of Origin effect, which will be examined in a following section.

McClure et al. in a 2004 study, tested the impact of branding on American consumers in a taste test between Coca-Cola and Pepsi. While both of these brands can confidently be considered household names, the longer history and "American" reputation of Coca-Cola resonated. In a blind taste test, around half of their respondents selected Pepsi over Coca-Cola, but when given a choice between the two products when knowing their identity, nearly 75% of all the respondents preferred the Coca-Cola brand (McClure et al., 2004). This groundbreaking discovery illustrates that preferences can be overridden by branding effects, specifically perception. The

long-term association of Coca-Cola on a significant percentage of consumers has caused them to not follow their taste preferences, but rather follow the better known product offering.

This discussion of branding and the classic case-study on Coca-Cola versus Pepsi leads us to a few conclusions. First, in establishing a reputation and determining core competencies, companies seek to gain an emotional buy-in by their target market. This is emotional branding, which has been defined as "a consumer-centric, relational, and story-driven approach to forging deep and enduring affective bonds between consumers and brands" (Roberts, 2004). When brands are able to create an emotional connection with a consumer through attitude and perception formation, there is a sense of loyalty which resonates within that person and causes them to decide on a brand that they have a connection with, even if their tastes or instant appeal is towards a competing brand (Keller, 2003). We expect this finding to ring true in this analysis and thus, it leads us to the following propositions:

- Proposition 1 – Consumers will be more likely to choose a brand which has a more established reputation when it comes to large-scale purchases.

- Proposition 2 – The greater the efforts of a company to create an emotional brand linkage, the stronger the branding effect.

2.2 Warranty

As alluded to in the introduction, warranties can be thought of as a guarantee behind the product that one is purchasing (Day & Fox, 1985). It is the company assuring the customer that their product will meet or exceed their expectation or they will rectify the situation to the customer's satisfaction. Warranties can be used as a profit-making tool since many firms sell them as a supplement to the product (for example, extended warranties on iPods or Televisions), or they can be used to retain customers by remedying problems that the consumer encounters (Day & Fox, 1985). In terms of a profit making endeavor, warranties appear to be a great source of additional revenue for a firm with relatively little risk. In a 2001 paper by Noel, the author shows that warranties are rarely invoked or utilized despite the consumer's willingness to pay more money for the extended coverage (Noel, 2001).

A consumer should keep in mind three factors when deciding on a product warranty: perceived risk, personal risk aversion, and magnitude of the purchase. Perceived risk is a major theme across the literature on warranty since they provide consumers with a sort of insurance which protects them from losing their original investment (Kelley & Conant, 1987). Other factors include the consumer's level of risk aversion, the failure rate of the product, and the price of that warranty (Albaum & Wiley, 2010). In their 1992 article, authors Voss and Ahmed determined three types of consumers who would be wise to purchase an additional warranty of a product or service: those who were very risk averse, those who have prior losses in the product category, and those who use a price-seeking strategy (Voss & Ahmed, 1992). A common pitfall for many consumers in terms of warranties on short-term items is that paperwork is lost or there is confusion as to who is providing the warranty. Large-scale purchases are a little different, in a sense that warranties are typically easier to implement (Shuptrine & Moore, 1980). The consumer will simply take the item or call the location where he or she purchased, and they will fix the warranty-covered problem or advise the consumer regarding the next step in enacting their warranty. Failing to provide warranty performance will have a negative impact on the consumer's view of the product and their satisfaction with the brand will plummet (Albaum & Wiley, 2010). While prior works have looked at the effect of a warranty and its associated "optimal menu for warranty coverage" (Padmanabhan & Roa, 1993), this paper seeks to be more of a guide for marketers in showing that customer perceptions of their firm's warranty offerings may be viewed by consumers in a distinct light considering a number of factors.

Consumers value the benefits of warranties and are not particularly concerned with who provides the maintenance, just that it gets done (Albaum & Wiley, 2010). In consumer behavior, satisfaction is defined as the comparison between the perceived value of a product and the actual value obtained by the customer from that product (Churchill & Suprenant, 1982). Thus, warranties can be looked upon as satisfaction enhancers if implemented correctly. The main hypothesis of this paper proposes that warranty is a moderator of the branding effort and will play a significant role in the selection of a product. The proposition listed below will be tested in order to gain a more comprehensive understanding of the impact of the warranty on the consumer's purchasing decision.

- Proposition 3 – Warranty will moderate the relationship between attitude/perception and purchase choice.

2.3 Choice

The following sections will examine the literature in choice theory and discuss the implications which guide a consumer's decision-making process. Special attention is directed on large-scale purchases since this category of products will be tested in our forthcoming empirical study. The most classic theory utilized in choice research is rational action theory (Gigerenzer & Goldstein, 1996). We will begin our discussion of choice here and then consider bounded rationality as another theory which can guide consumers in their decisions on large-scale purchases. Finally, we will discuss an emergent theory of choice in which an overload of options and attributes may be detrimental to the consumer's decision-making process. We anticipate that bounded rationality will guide most consumers in their decisions when it comes to large-scale purchases.

2.3.1 Rational Choice Theory

A key principle in society is rationality. It appears as though people strive to make rational decisions in their everyday lives to better themselves, their family, and from a religious perspective, even their soul. This assumption is the central premise upon which rational choice theory lies upon (George, 1998). Traditional economic theory dating back to the 1950s postulates that a consumer is an economic being and thus operates under a set of principles and preferences that are rational in his or her decision making process (Simon, 1955). Individuals will maximize their rewards or benefits from a decision to increase utility (Altonji, Fumio, & Kotlikoff, 1992; Blau, 1964; Coleman, 1998; Cox & Rank, 1993). Despite prevalent themes in American society such as overspending, lack of saving, indulgence, and other poor financial behaviors, people attempt to act as rationally as possible when considering large purchases (Tversky & Simonson, 1993). Thus, the consumer will weigh several options with the outcome of the maximum possible net benefit at the core of the matter. While the degree to which a consumer is a "maximizer" when it comes to decisions varies, present day American society has afforded consumers to have a vast array of options in almost all product and service decisions.

Snow and Oliver, in a 1995 article on consumer behavior, developed three elements that can be used to calculate the net benefit by a consumer. First, there is the actual value of the benefits to be reaped as a result of the choice (Snow & Oliver, 1995). The customer, based on importance to him or her (or his or her family), will assign a certain value to product attributes. Warranty is an aspect that should be given significant consideration here, particularly in a large purchase decision. Next, the consumer will consider the cost associated with a particular choice. Things to consider here would be the amount of debt he or she will be required to take on or the amount of money per annum that is required to support this product or service. Finally, the consumer will take into account the opportunity cost associated with making the purchase (Snow & Oliver, 1995). In big-ticket purchases, this might be the forgone benefit of putting an addition onto one's home, sending children to private school, or the lost investment opportunity of money set aside to make this purchase. Opportunity costs need not be related to the actual item (like other competing models or options in that industry), and thus can encompass various facets of one's financial life. Rational consumers will consider these elements in making his or her decision. Rational choice theory assumes that choices are intentional, conscious, and rational (Snow & Oliver, 1995).

Rational choice is at the individual level. There is no one-set rational choice, but rather a unique and custom solution for each consumer based on the values and weights assigned to each factor in a decision model. From a marketing perspective, one must know what it is that the customer values in order to present an ideal solution for that person (George, 1998). Of course, firms do not specifically advertise and promote to customers on case-by-case basis, but rather they obtain information about a variety of consumer needs and try and meet as many of them as possible within the realm of their product offering. We expect that elements of the warranty such as length of time, ease of use, premium paid for the warranty, country of origin, national psychic distance, and the secure-feeling elicited from the warranty will combine to result in a significant impact on choice.

In closing our discussion on rational choice theory, we believe as though individuals will be hard-pressed to make precisely rational decisions at every turn. A more appropriate theory which has emerged is bounded rationality. This theory is a variation of purely rational decision making, and it is discussed in the following section.

2.3.2 Bounded Rationality

In a perfect world, all consumers in all of their purchases would make precisely rational choices every time, with no exceptions. However, this is a naïve assumption to make when considering the seemingly endless possibilities which can skew our rationality. To give one example which has been investigated in the consumer behavior literature stream, Hirschman and Holbrook (1983) look at hedonic consumption and find that in some instances, emotional desires dominate utilitarian motives in the choice of products. Thus, for those consumers who chose

Pepsi over Coca-Cola in McClure's 2004 experiment, they could have been operating according to hedonic motivation towards their purchase intent, trusting their taste-buds over their preconceived notion of the Coca-Cola brand. Hedonically-experienced products deserve special attention because of their capacity to generate unusually strong emotional involvement (Hirschman & Holbrook, 1982).

It would be easy to think of many other instances in which a consumer's rational-thinking behavior towards product choice can be skewed. Thus, researchers have developed the bounded rationality theory which guides consumer decisions based on limited time, limited knowledge, and offering complexities (Gigerenzer & Goldstein, 1996). As alluded to earlier, heuristics and biases can also be part of this "irrational" type of behavior based on personal preferences (Lopes, 1992). Basically, bounded rationality shifts its focus from a consumer making a precisely rational decision to a consumer making a reasonable decision based on accepted limitations (Keeney & Raiffa, 1993). When it comes to large-scale purchases, consumers will do their best to consider the relevant options and alternatives, but their rationality still may be compromised because of situational factors. For example, if a consumer's washing machine breaks, he or she may not have enough time to consider all of the options since the appliance will need to be replaced within a finite amount of time to keep the family in clean clothing. This would be a large-scale purchase decision and it would be constrained due to limited time. Therefore, the consumer would need to make his or her decision based on bounded rationality. Essentially, a consumer adapts to his or her constraints (time, resources, or complexities) and proceeds to make the most reasonable decision possible out of his or her scenario (Gigerenzer & Selten, 2002; Simon, 1957). We anticipate that bounded rationality will be the driving theory which directs consumers in their large-scale purchasing decision.

2.3.3 Emerging Choice Theory

In a 2004 book entitled "The Paradox of Choice," author Barry Schwartz suggests that the multitude of choices in present day society has actually hindered upon our freedom as members of a free country. He has claimed that having too many options can lead to an overload of information, bad decisions, and even depression (Schwartz, 2004). Schwartz recommends that a consumer creates a personal set of rules for his or her purchases, thus binding his or her rationality at the onset of the decision-making process. An example set of rules for a purchase decision process might look as such: consider three options for a reasonable amount of time, select the most viable one, perform the transaction, move forward confidently in the decision, and spend the most time on the things that are truly important to me (Schwartz, 2004). This is an interesting study and one that may hold a lot of truth moving forward as we encounter more and more options in the consumer experience. Perhaps another type of rationality, building upon bounded rationality, will emerge from these types of studies. Despite this emerging perspective on choice overload and how consumers ought to act in given purchasing scenarios, we assume that this theory has yet to catch on and that the vast majority of consumers in present day society will operate on a bounded rationality basis as discussed by some of the leading authors in this area (Gigerenzer & Goldstein 1996; Simon 1957).

2.4 Additional Branding Factors

The following four subsections will add to the comprehensive understanding of the factors which create the branding effect in a consumer. In addition to creating a reputation and emotional appeal for consumers to invest in the brand as posited in propositions 1 and 2, we expect that four other factors will help explain the branding phenomenon. These factors are ease of product recall, country of origin, psychic distance, and national exposure. Each is examined in the following sections.

2.4.1 Ease of Product Recall

Choice researchers often ignore the important element of the consideration set during and prior to evaluation and choice (Nedungadi, 1990). For example, even if a person is not in the market to purchase a new television, he or she may see commercials or other advertisements which promote the latest and greatest products from particular brands. Sony has released many recent commercials which elaborate on their new 3-D LED televisions which are supposed to be some of the most sophisticated and innovative products in the last thirty years. While I am not in the market to be purchasing a television set, I have recalled that entire last statement simply out of memory and brand association with Sony. This is what researchers refer to as a working brand memory, and there is empirical support which suggests that all consumers have a working brand memory which they appeal to in the decision-making process (Alba & Hasher, 1983; Kahnemann & Miller, 1986). Certain brands and their product offerings will be able to be retrieved from a consumer's mind even when they are not intending to make a purchase. Thus, when a consumer is actually called to make a decision, those products and brands will be easier to access than others that were not known before encountering the decision process. The working brand memory

formulation process is dependent upon the frequency, recency, and salience of the brand (Barsalou, 1985; Kintsch & Young, 1984). In other words, the more times the consumer is exposed to a brand image or specific brand offering, the more likely it is that he or she may consider this brand or product when evaluating a purchase decision. To refer to a somewhat cliché expression, a first impression means everything. Thus, we expect that the ease of product recall will have a direct impact on the branding effort by a particular firm. Once a consumer has a product offering in mind, he or she may be reluctant to consider alternatives or hold an image from his or her working brand memory as the threshold for all other forthcoming considerations. We will examine this effect via the following proposition:

- Proposition 4 – Ease of product recall will have a positive effect on attitude/perception during the decision making process.

2.4.2 Country of Origin

Country of Origin (COO) relates to the country in which a product or service originates. A "Country of Origin Effect" has been investigated by several authors in the international marketing literature (Bilkey & Nes, 1987; Hong & Wyer, 1989; Kim & Chung, 1997; Zhou & Hui, 2003). In 1997, Kim and Chung found that country image affects the impact of marketing variables on sales (Kim & Chung, 1997). Next, in their groundbreaking work on the subject of Country of Origin, Bilkey and Nes (1987) reach the conclusion that consumers tend to evaluate domestic products more favorably than foreign products. This is logical and may stem from ethnocentric feelings towards one's own country and its corresponding product offering. There is also a trust factor which makes the national brand appear preferable to its domestic consumers (Zhou & Hui, 2003). When considering large-scale purchases in particular, we expect that country of origin effects may be evident in consumers today. Ultimately, attitudes toward products from a country may vary by industry; therefore, conflicting results are likely across research in different product areas (Bilkey & Nes, 1987).

A product's COO stimulates subjects' interest in the product and consequently leads them to think extensively about product information and its evaluative implications (Hong & Wyer, 1989). That being said, COO is not the attribute upon which consumers ultimately decide on products, it is merely one of many attributes (Hong & Wyer, 1989). Peterson and Jolibert investigated the COO effect in their 1995 study and found that it is a stronger predictor for quality/reliability perceptions than purchase intentions (Peterson & Jolibert, 1995). Thus, when thinking about warranty, the COO of the product will impact the perception of the quality of the warranty. Consumers will spontaneously and actively attempt to confirm the validity of COO stereotypes as they receive information about specific products from various countries (Hong & Wyer, 1989).

In terms of large-scale purchases, the COO effect in the automobile industry was investigated roughly 25 years ago in Johansson, Douglas, and Nonaka's 1985 work. The results of this research project were mixed. On the factor of gas mileage, COO had a positive impact on overall automobile ratings; however, automobiles receiving high overall ratings tended to be underrated on gas mileage, suggesting that a preferred car would not have good gas mileage (Johansson, Douglas, & Nonaka, 1985). Further, the COO of an automobile does not seem to affect overall ratings, but has some effects on specific attributes (Johansson et al., 1985). We expect similar results when doing empirical work on this study: that the COO of a large-scale purchase will play a role in the branding effort, but it will not be the deciding factor in the purchasing decision. We also expect that when the COO effect is moderated by warranty, there will be a greater chance that the domestic customer will be willing to purchase this product. Thus, the following propositions are posited:

- Proposition 5 – The Country of Origin will not be sufficient for making a purchasing decision.
- Proposition 6 – When the Country of Origin Effect is moderated by Warranty, a consumer's willingness to purchase will be increased.

In concluding this brief discussion on COO and its effects, two main findings will be relied upon moving forward. First, certain countries may have a special advantage in exporting manufactured goods based on their present reputation regarding the product categories (Bilkey & Nes, 1987), and secondly, brands originating from a particular country share intangible assets that are unique to brands from the same country (Kim & Chung, 1997).

2.4.3 Psychic Distance

The Psychic Distance concept has been defined as an individual's perception of the differences between a home country and a foreign country that shapes the thoughts and feeling towards that country's products or services (Sousa & Bradley, 2006). Psychic Distance is measured at the individual level and varies on a case-by-case method, hence the root of the term coming from the Greek word for one's mind or soul (Sousa & Bradley, 2006).

Much current research has investigated the correlation between psychic distance and a person's ethnocentrism (O'Grady & Lane 1996; Shimp & Sharma, 1987). One could reasonably expect that if a consumer who was very ethnocentric had the option between a domestic and a foreign product, he or she would likely choose the domestic product given the ethnocentric viewpoint and low tolerance of cultural distance. Thus, we believe that psychic distance will be a factor in a customer's evaluation of a particular brand.

In their 1996 piece entitled "The Psychic Distance Paradox", authors O'Grady and Lane describe some of the indicators of psychic distance, which will be considered in the empirical portion of this research. It should be noted than many of these indicators are similar to that of Hofstede's dimensions; it is clear that this stream of research was influenced greatly by *Cultures and Organizations* (Hofstede, 1991). To begin, the level of economic development is an indicator of psychic distance (O'Grady & Lane, 1996). For example, the distance between the United States (a developed country) and Canada (another developed country) would be less than the difference between the United States and India (a developing country). Therefore, it is expected that a domestic consumer in the United States would have less resistance to buying a product from a similarly categorized economy. Next, level of education is another psychic distance indicator (O'Grady & Lane, 1996). A consumer considering purchasing an item from a foreign manufacturer may consider this factor and make a generalization of the company's competence based on its national education system. Finally, another indicator has to do with language. This incorporates both national language as well as business language (O'Grady & Lane, 1996). The language indicator may be confounded by the fact that most major multinational firms have North American presence and thus, they do business comprehensively in English when dealing with American customers. However, since the language factor was found to be a predictor previously, we will investigate it in this study as well. Based on the literature review in psychic distance, we posit the following two hypotheses to be tested in through this research on large-scale purchases:

- Proposition 7 – Psychic Distance will positively or negatively affect the consumer's perception of a brand, depending on the proximity between the purchaser and the foreign brand in terms of education, economic development, and language.

- Proposition 8 – When the Psychic Distance factor is moderated by Warranty, a consumer's willingness to purchase will be increased.

With regard to proposition 8, we expect that the moderating effect of warranty will parallel the relationship posited in proposition 6, in the sense that a warranty will be used to offset some of what consumers might perceive as an international risk in purchasing a product from a country dissimilar to the United States.

2.4.4 National Exposure

In concluding our discussion on additional branding factors, we expect that the national exposure of a brand will have an impact on the branding effort. One of the first academic teams to research this area was Bellizzi, Kruckeberg, Hamilton, and Martin in 1981. In their study, it was discovered that regardless of actual quality of the items, national brands were rated higher in terms of quality, appearance, and attractiveness (Bellizzi et al., 1981). Several other findings have confirmed their original findings (Cunningham, Hardy, & Imperia. 1982; Livesey & Lennon, 1978). To give an example, brands such as Gatorade (Pepsi) and Powerade (Coca-Cola) are given such national exposure via sports advertisements, team apparel, signage at arenas, and sponsorship, that a competing brand not actively engaged in marketing to the national audience (such as PurAqua - a national brand which is sold throughout the US as a "knock-off" to the main competitors – the firm does no advertising) will be met with resistance from the customer due to issues of trust and quality with the unknown brand. Despite the savings or potential quality that can be derived from the unknown brand, the consumer will resist purchasing it nonetheless (Livesey & Lennon, 1978). Thus, the following proposition is made:

- Proposition 9 – The degree of national exposure a brand is given (as defined by its presence in the media and marketplace) will be positively associated with the attitude/perception effect of the firm.

3. Proposed Frameworks

This research project is interested in gaining a better understanding of the impact of warranty on attitudes / perceptions and choice decisions for large-scale purchases. The following frameworks are proposed which illustrate the relationships we anticipate in data collection. Each proposition is identified where it will be examined:
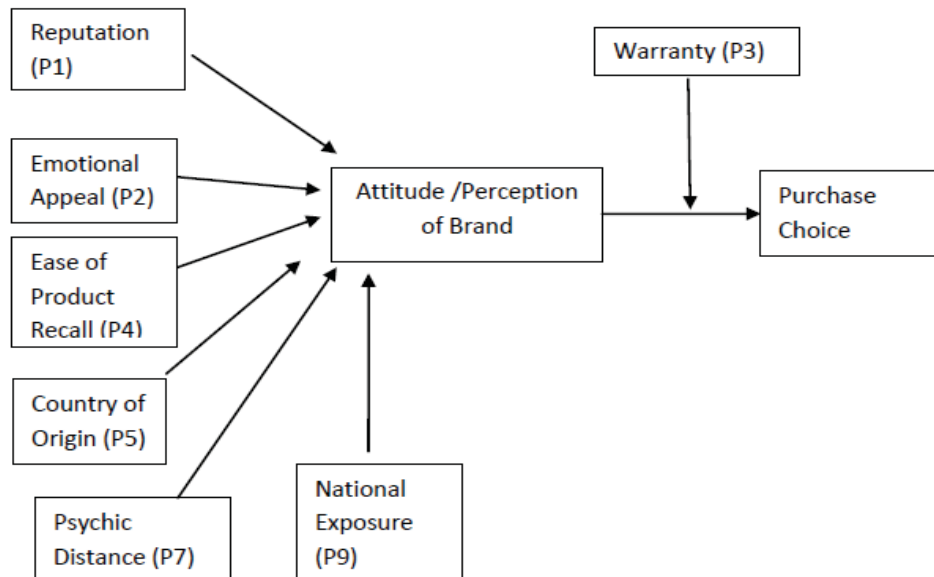
Figure 1. The Moderating Role of Warranty on Purchase Choice

To test the second propositions on both Country of Origin and Psychic Distance (Propositions 6 and 8), the following two frameworks are anticipated to emerge from our empirical study:
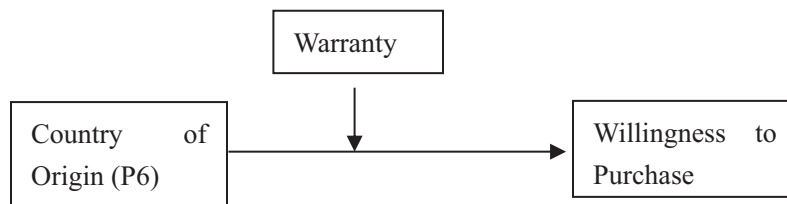

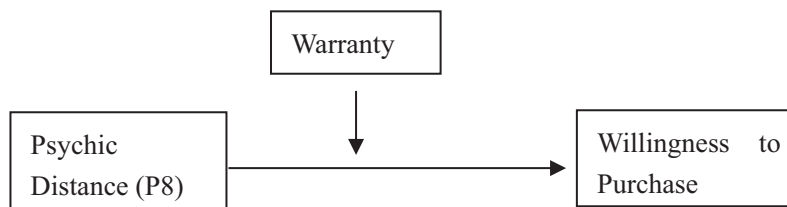Figure 2. Country of Origin and Willingness to Purchase

Figure 3. Psychic Distance and Willingness to Purchase

4. Managerial Implications

Marketing managers can use the results of this research in many very practical ways. To begin, by gaining a more comprehensive understanding of the impact a warranty has on the consumer's decision-making process, firms will be in a better position to effectively allocate resources to its warranty offering and warranty advertising. Next, for firms from psychically distant countries (compared to the United States), marketing managers can promote their warranty so as to guarantee the claim that their brand's offering will parallel, if not exceed, the expectations from firms in countries that are less psychically distant. For example, since Japan is a developed economy much like the United States, an American customer will place a greater reliance on the Japanese offering since he or she is aware of the country's reputation for high quality as well as the similarities between the two economies and level of education. On the other hand, in countries that do not parallel the United States in terms of economics, language, and education, consumers are likely to meet such product offerings with resistance. The quality of a foreign warranty, in such cases, is proposed to compensate for the lack of proximity in psychic distance. To lessen the impact of psychic distance on large-scale purchases, International marketing

managers can make efforts in branding by illustrating "taste-test" results much like the classic Coca-Cola and Pepsi example of McClure et al. in 2004.

Managers and firms can also make efforts to help the consumer in their decision making process. As has been illustrated by recent literature (Schwartz, 2004), consumers can many times be completely overwhelmed in the decision making process with all the choices, options, and advertisements seemingly everywhere they look. If firms were to present their offerings in such a way that focuses only on the critical elements of the purchase decision, consumers will be able to approach the decision with a sense of ease and clarity, thus increasing their ability to make a reasonable decision. Naturally, firms will be competing for the same clientele, so managers (particularly marketing managers) will need to be creative so as to distinguish themselves, but not overwhelming so as to fend off potential buyers.

5. Conclusion

At the end of the day, a warranty is a critical element of purchasing, particularly with large-scale items. When a consumer risks a large amount of his or her finances on a significant purchase, there are expectations that come along with that purchase decision. Firms can ease the consumer's mind by assuring them that the product will meet or exceed expectations, or the company will rectify the situation to the customer's satisfaction with an effective warranty. Eliciting this ease of mind in the consumer is the critical deliverable of the warranty, and when consumers realize satisfaction either by not experiencing problems or calling upon the warranty to make things right, an emotional relationship can be established between the firm and the customer. This implication pays dividends not only once, but many times via repeat purchases by satisfied, loyal customers. Research has shown that positive past brand experience leads to customer retention and the overall resonance of the brand (Oliver, 1993). Therefore, a warranty can be thought of as a critical component of a product offering that must be managed, fostered, and continually revised so as to meet or exceed customer expectations.

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Factors Influencing the Implementation of Activity-Based Costing: A Study on Malaysian SMEs

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Abstract

Literature has indicated that factors such as--the external environment, cost saving mechanisms, user attitude and company size--may have an effect on the implementation of activity-based costing (ABC). Furthermore, literature has revealed that there is still lack of research on the effect of these factors on the implementation of ABC among small and medium sized enterprises (SMEs) in Malaysia. As such the aim of this research is to test the relationships of these factors on the implementation of ABC among SMEs in Malaysia with the aim of contributing to existing research on the ABC system in the area of management accounting. A total of 200 respondents participated in this research. The results of the study revealed that all four factors; the external environment, cost saving mechanisms, user attitude and company size have significant relationships with the implementation of ABC among SMEs in Malaysia.

Keywords: company size, cost saving mechanisms, implementation of activity based costing, the external environment, user attitude

1. Introduction

According to Cooper and Kaplan (1991), Activity-Based Costing (ABC) is a management accounting technique that assigns cost to products and services based on the resources that these products and services consumed hence, ABC is an approach to the costing and monitoring of activities, which involves tracing resources consumption and costing of final output, thus focuses attention on cost drivers; the activities that cause cost to increase. As the manufacturing sector experiences technological advancement in automation and robotics, changes have been taking place in the manufacturing cost structure which led to the shift from traditional volume based costing to the ABC method (Zhang & Isa, 2010). Furthermore, besides innovation and increased technology, the globalisation of products and services have created a competitive business environment hence, requiring data to be identified accurately and must be relevant to the cost and performance of the organisation's activities, thus the importance of the ABC method in today's environment (Ismail & Reddy, 2017). Initially, the adoption of ABC was slow due to the high expenditure involved in employing and sustaining the ABC system, however the ABC system has been used widely in countries such as the United States of America (USA) (Brierley, 2009), the United Kingdom (UK) (Al-Omiri & Drury, 2007), and Canada (Quinn, Elafi, & Mulgrew, 2017). This costing system has gained international recognition in not only developed countries but emerging economies such as China (Anderson & Young, 1999), Taiwan (Lou, Wang & Lan, 2017) and Malaysia (Ahmad, Teng, & Zabri, 2015; Maelah & Ibrahim, 2007) as they gain competitive advantages in the pursuit of globalizing their economies.

There are four generations of ABC evolving from 1987 to 2010. Firstly, ABC appeared as an accurate costing system, as cost and profit drivers and as a tool used for activity-based management. In the second generation, it was being applied in a multi-industry; used as an extended value chain and as a predictive model in process analysis. In 2000, during the third generation of ABC, it became a sustainable enterprise system in many industries. Lastly, it provided integrated performance management solutions and was used as an analytical tool. ABC as such has been evolving drastically over more than two decades; starting from an early experiment in costing, ABC eventually appeared as a tool for profit improvement (Hooper, Tsamenyi, Udin, & Wickramasinghe, 2009). Some of the benefits of the ABC system include better job allocation of overhead expenditure as it does not group costs that are spread out across many different activities, ABC also does a better

job of separating the cost of idle capacity from the true cost of producing a product and finally, ABC provides management with a way to have continuous improvement, help to identify cost and profit enhancement opportunities subsequently, leading to better company profitability (Kocakulah, Foroughi, Stott, & Manyoky, 2017).

Although the implementation and success of ABC can be seen in multinational companies (MNCs) such as automotive manufacturers; General Motors, Chrysler and Ford Motors as well as food processing companies such as Nestle and Mondelez and, waste recycling company such as Safety Kleen (Beheshti, 2004; Mahal & Hossain, 2015; Zhang & Isa, 2010), SMEs have also started implementing the ABC method especially in the wine industry and in cook-shops (Finke & Businska, 2011). Despite the fact that the ABC method can be costly and time consuming, an SME's size and business structure allows them to be flexible and innovative, allowing them to incorporate the ABC system into their business to gain a competitive advantage as they expand their business (Gunasekaran, Marri & Grieve, 1999). In most countries including Malaysia, SMEs make up the majority of the business population, hence they play an important role in generating economic growth (Ahmad, 2012; Ahmad, 2014; Nair & Yee, 2017). SMEs make up 95 percent of enterprises worldwide, accounting to 67% of employment in private sector and 52% private sector value added (Kocakulah et al., 2017). Ahmad et al. (2015) stated that more than 90 % of the total manufacturing output (Gross Domestic Product and exports) in Malaysia was generated by SMEs. The Malaysian government has enacted various policies to promote SME development and improve performance by providing financial assistance and training in technical aspects (Ahmad, 2012). Furthermore, SMEs have taken practical steps in implementing management accounting practices (MAPs) such as ABC to improve accuracy of costing, pricing and planning (Hall & McPeak, 2011). Although ABC has received wide spread acceptance, there is still lack of information on the factors affecting the implementation of ABC among SMEs especially in Malaysia.

The appraisal of previous studies has indicated that factors such as the external environment, cost saving mechanisms, user attitude and company size, may have an effect on the implementation of ABC in SMEs (Ahmad, 2012; Ahmad et al., 2017; Chand & Dahiya, 2010; Nandan, 2010; Sohal & Chung, 2011). The external environment is one of the important factors that promoted the usage of ABC in SMEs as market competition can play an important role in encouraging SMEs to use the ABC system. Although SMEs may not need comprehensive MAPs, nevertheless, SMEs play an important role in the economy, they face similar forms of complexity and may be prone to failures, and hence better resource allocation together with a timely, accurate and reliable costing method is needed (Nandan, 2010). As such, SMEs use ABC for accurate cost calculation and competitive pricing (Ahmad, 2012, Nair & Yee, 2017). Furthermore the implementation of the ABC system may also be the result of companies incorporating their objective of gaining competitive advantage as SMEs continue to grow bigger. Furthermore the cost management of ABC also concentrates on target costing and searches for possibilities to improve customer satisfaction, improve productivity and maximize profit.

In terms of ABC as a cost saving mechanisms, in India, SMEs that explored the usage of MAPs such as ABC found that the firms' cost reduction and quality improvement led to the success of ABC (Chand & Dahiya, 2010), Furthermore, the use of the ABC system has allowed SMEs to achieve cost saving and transparency in their operations especially when these companies strive to attain competitive advantage in the age of globalization (Kocakulah et al., 2017).Another important factor that may contribute to the implementation of ABC in SMEs is the user attitude. Many users have inconsistent opinions about the ABC system in SMEs, due to lack of education and awareness. Nevertheless, with the government support and training, the user attitude towards the implementation of ABC may become positive (Yapa & Konchange, 2012).Research has indicated that together with the management commitment and an ABC project team, a user attitude was vital to the successful execution of the ABC system (Sohal & Chung, 2011).Furthermore, to create awareness of the ABC system, user attitude and personal characteristics may also have an influence in the employment of the ABC system in SMEs (Machado, 2012).

Finally another factor that may have an effect on the implementation of ABC in SMEs is the company size. Larger firms may have greater resources to allow for the successful implementation of MAPs such as the ABC system (Ahmad, 2012; Nair & Yee, 2017). As a company becomes bigger, there would be greater amounts of information to be handled, thus ABC system becomes appropriate in accurate representation of how activities perform the creation of a product or service. Furthermore, activity related information would be greater in large companies as there are greater resources leading to an effective use of ABC, nevertheless, ABC would be beneficial and valuable to SMEs if implemented and used correctly under the right conditions (Baird, Harrison & Reeve, 2004).

The appraisal of previous studies has indicated that the external environment, cost saving mechanisms, user attitude and company size have been commonly cited as factors that may affect the implementation of ABC among SMEs. There is still limited research examining the impact of these factors with the implementation of ABC among SMEs in Malaysia, hence this study aims to study the relationship of these factors with the implementation of ABC among SMEs in Malaysia, subsequently providing new evidence to existing research on the implementation of the ABC method among SMEs.

2. Literature Review and Hypotheses Development

2.1 Relationship between the External Environment and the Implementation of Activity-Based Costing

The external environment is defined as forces outside the organization such as market competition and perceived environmental uncertainty that can influence an organization's day to day activities (Chenhall, 2007). Previous research by Ríos, Colomina, and Rodríguez-Vilariño (2014) found that there is a growing awareness on the importance of the ABC system in SMEs as they become competitive in the era of globalization. Furthermore, it was found that the ABC system was used as a weapon to cushion SMEs from a volatile business environment and subsequently improved their survival in the business (Kraus, Harms & Schwarz, 2006). Competition is thus an external factor that lead to SMEs to use sophisticated MAPs such as the ABC method (Zhang & Isa, 2010). According to the research by Elhamma and Zhang (2013) in Morocco using a sample size of 48 industrial enterprises with 48% consisting of SME and 52% consisting of large firms, it was found that the influence of the external environment such as market competitiveness resulted to the implementation of ABC. Furthermore Byrne (2011) found that the level of the external environment was found to be a contributing factor in the implementation and success of the ABC system. As such, the following hypothesis is developed:

H1: There is a significant positive relationship between the external environment and the implementation of activity- based costing in Malaysian SMEs.

2.2 Relationship between the Cost Saving Mechanisms and the Implementation of Activity-Based Costing

Cost saving mechanisms are defined as a tools used by a company to save money through the reduction of expenses associated with the activities of the company. SMEs intention to save cost could be a leading factor for the implementation of ABC. Kulmala, Kajuter, and Valkokari (2007) found that although SMEs in general did not focus on cost management tools nevertheless, MAPs such as the ABC system have allowed SMEs to better understand the links between activities, operating results and network cost, hence increasing cost awareness and prompting the use of the ABC method among SMEs. In the research by Cagwin and Bouwman (2002) on the improvement of financial performance with the use of the ABC system, the authors found that the usage of other cost saving mechanisms such as Total Quality Management (TQM) and Just in Time (JIT) used together with ABC contributed to the successful implementation of ABC. Furthermore, James's (2013) study in Jamaica on commercial and merchant banks found that the perceived ability of ABC to assist in cost control and saving allowed for the implementation of ABC. As a result, the following hypothesis was proposed:

H2: There is a significant positive relationship between cost saving mechanisms and the implementation of activity-based costing in Malaysian SMEs.

2.3 Relationship between the User Attitude and the Implementation of Activity-Based Costing

User attitude is defined as an individual's positive or negative feeing associated with performing a specific behavior (Ajzen & Fishbein, 1975). Briciu and Căpuşneanu (2010) stated that the emphasis by management to change user attitude and encourage employees to learn and grow for the purpose of self-improvement would lead to the successful implementation of the ABC system. According to Xu (2012), lack of cooperation within the organization may have an effect on the implementation of ABC. The author also found that a good user attitude could possibly change the adoption and correct use of the ABC system. According to Khozein and Dankoob (2011), user denial is one of the reasons affecting the implementation of ABC in their organisations. In the study by Dubihlele and Rundoro (2014) on 149 SMEs in South Africa, it was found that user attitude; managerial commitment was a precursor to the implementation of ABC of SMEs in South Africa. As a result, the following hypothesis was developed:

H3: There is a significant positive relationship between user attitude and the implementation of activity-based costing in Malaysian SMEs.

2.4 Relationship between the Company Size and the Implementation of Activity-Based Costing

Company size is defined as "the number of employees in the organization, however organization size can also be measured by the paid up capital of the organization" (Nair & Yee, p. 178). Size has been found to have an

important factor affecting the implementation of ABC as research has found that companies with greater resources and complex administration systems have a better success rate with the implementation of ABC (Al-Omiri & Drury, 2007). In the research by Pokorná (2016) on 548 Czech medium and large companies, it was found that size moderately affected the impact of ABC on financial performance. Finally, according to the research by Elhamma (2012) on 62 firms in Morocco, it was found that the firm size positively influenced the use and successful implementation of ABC. As such, the hypothesis below was postulated:

H4: There is a significant positive relationship between company size and the implementation of activity-based costing in Malaysian SMEs.
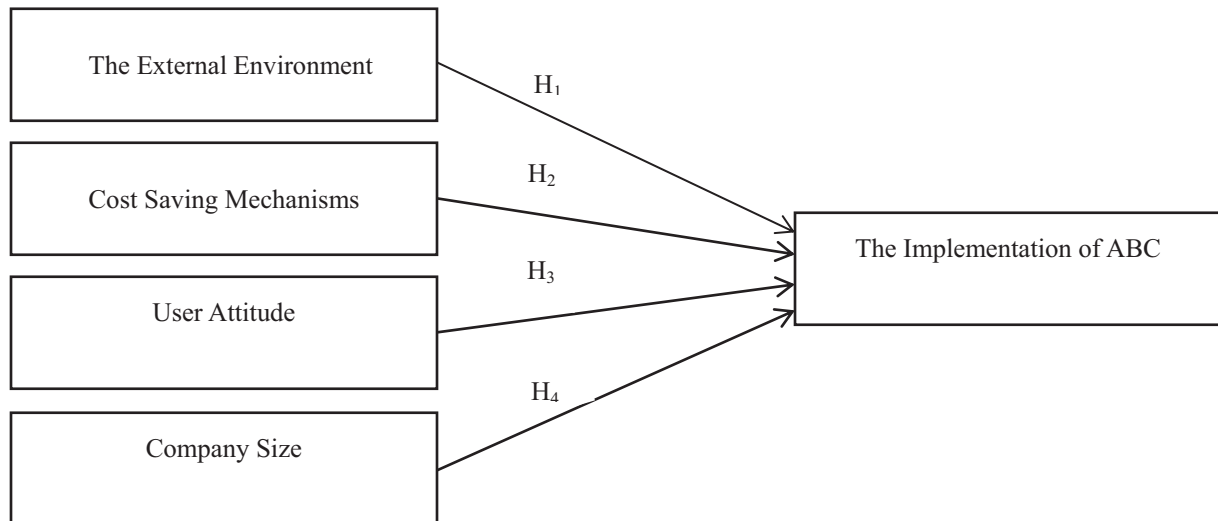

Figure 1 shows the research model and the related hypotheses

3. Research Method

The deductive approach using explanatory research was applied in this study to establish the relationships between the variables (Sekaran, 2006). The study focused on SMEs in the manufacturing industry in Selangor Malaysia due to the high concentration of SMEs in this state compared to all the other states in Malaysia (Department of Statistics Malaysia, 2016). The sample was collected using a quantitative approach using non-probability sampling method; purposive sampling technique. Data was collected from 200 respondents from SMEs in Selangor Malaysia who have begun implementing the ABC method and are registered under the SME Corporation of Malaysia. These companies are in the process of forming a team of ABC implementation which according to Faudziah and Rababah (2011) are companies that have determine project scope and objectives; have design training and workshops, have collected data, have analyzing activities, cost drivers and have organizational members commitment to use ABC.

A self-administered questionnaire was used to collect data from 200 respondents who held financial executive positions in these SMEs who are involved in the ABC implementation of their respective organisation. The questionnaire in this study was separated into two sections. The first section required the respondents' to provide information with regards to the number of full time employees, average annual sales and business duration of their organization followed by the respondents' education level. The second section of the questionnaire utilized several measures. The variables; implementation of ABC and company size was measured using a five item scale adapted from Elhamma (2012). As for the external environment, a five item scale was adapted from Hansen and Van der Stede (2004). A five item scale for cost saving mechanisms was adapted from Cagwin and Bouwman (2002). As for user attitude, a five item scale was adapted from Ismail and King (2007). A 5-point Likert scale ranging from (1) "Strong Disagree" to (5) "Strongly Agree" was used to measure the variables in this study. The data from this study was computed using SPSS.

4. Data and Result Analysis

A reliability test was conducted and it was found that reliability test of the each of the variables in this study was more than 0.80. (Hair, Black, Bablin, & Anderson, 2010; Sekaran, 2006). In additional to this, normality test was done using z-score calculation. The result of the normality test of 0.756 was within the acceptable range of $-3.29 < Z > 3.29$. Furthermore, the graph and histogram of this study was also normal. Moreover, a linearity test was conducted to test the relationship of every independent variable to the dependent variable. The graphical method

was used in this research to evaluate linearity; Ii was found that the study produced randomized pattern indicating that the linearity assumption was met. For the descriptive data, Table 1 shows the profile of respondents' organisation.

4.1 Profile of Respondents' Organisation.

Table 1. Number of Full Time Employees, Average Annual Sales, Business Duration and Education Level of Respondents

Types	Categories	Frequency	Percent
Number of Full time employees	5-75 (small)	70	35
	75-200 (Medium)	130	65
Average Annual Sales	RM0-RM300,000	14	7
	RM300,000-RM15 million	78	39
	RM 15 million-RM50 Million	90	45
	RM50 million and above	18	9
Business Duration	<5 years	20	10
	5 -10 years	50	25
	11-15 years	90	45
	>16 years	40	20
Education Level of Respondents	Undergraduate	47	23.5
	Postgraduate	90	45.0
	Professional Qualification	56	28.0
	Others	7	3.5

4.2 Pearson Correlation Test

The Pearson Correlation (r) test was used to measure the strength and direction of a linear relationship between two variables. The value of (r) is always between +1 and –1. The results of the correlation test shows that the external environment was 0.717, cost of saving mechanism was 0.752, user attitude was 0.710 and company size was 0.699. The result of the correlation test indicates that the external environment, cost saving mechanism and user attitude has a strong positive correlation with the implementation of ABC while, company size has a fairly high positive correlation with the implementation of ABC. The Pearson Correlation test results are shown in Table 2.

Table 2. Pearson Correlation Test

		Implementation of Activity Based Costing	The External Environment	Cost Saving Mechanisms	User Attitude	Company Size
Implementation of Activity Based Costing	Pearson Correlation	1	.717	.752	.710	.699
	Sig. (2 tailed)		.000	.000	.000	.000
	N	200	200	200	200	200

4.3 Multiple Regression Analysis

In order to examine the research hypotheses, the Multiple Regression test was conducted for the general purpose of studying the association among the independent variables and the dependent or criterion variable ((Sekaran, 2006).). This study produced an R Square value of 0.816. This means that 81.6% of the total variance in the dependent variable was explained by the total independent variables in the study, as such the higher the R square value, the stronger the relationship between the variables in the research. Furthermore, the value of Durbin Watson must be in the range of 1 to 3. In this research, the value of Durbin Watson was 1.781 which is in the range of 1 to 3. This shows that there is no autocorrelation problem among the residuals and thus the assumption of homoscedasticity was satisfied. Table 3 shows the model summary.

Table 3. Model Summary

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.816[a]	.667	.660	.45669	1.781

The model is fit to use for further analysis if the significant value is equal or below than 0.05. Based on the ANOVA analysis, the results of significant value is 0.000 which is below 0.005, hence there is a significant relationship between each of the independent variable (the external environment, cost saving mechanisms, user attitude, company size and the dependent variable (implementation of ABC). The F-statistic was 97.482 indicating that the model of this study is strongly significant. Besides that, the F value indicates that the variance

is not totally accounted for by possibility. Table 4 below shows thee analysis of variance (ANOVA).

Table 4. Analysis of variance (ANOVA) in this study

ANOVAª

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	81.327	4	20.332	97.482	.000[b]
	Residual	40.671	195	.209		
	Total	121.998	199			

The results of the coefficients shows that coefficients between the independent variables (the external environment, cost saving mechanisms, user attitude, company size and the dependent variable (implementation of ABC) are significant. All below 0.05. This indicates that the proposed research hypotheses can be accepted. The results if coefficients can be seen in Table 5 and the summary of the hypotheses results are in Table 6.

Table 5. Results of the coefficients

Coefficientª

Model		Unstandardized Coefficients		Standardized Coefficients			Collinearity Statistics	
		B	Std. Error	Beta	T	Sig.	Tolerance	VIF
1	(Constant)	.217	.176		1.234	.219		
	External Environment	.209	.067	.212	3.106	.002	.367	2.722
	Cost Saving Mechanisms	.317	.074	.314	4.276	.000	.318	3.144
	User Attitude	.257	.069	.244	3.714	.000	.396	2.523
	Company Size	.164	.074	.152	2.209	.028	.363	2.757

Table 6. Summary of the Hypotheses Result

	Hypothesis	Significant	Result	Gradient (Beta, β)
H₁	There is a significant positive relationship between the external environment and the implementation of activity based costing in Malaysian SMEs.	0.002	Accepted	.212
H₂	There is a significant positive relationship between cost saving mechanisms and the implementation of activity based costing in Malaysian SMEs.	0.000	Accepted	.314
H₃	There is a significant positive relationship between user attitude and the implementation of activity based costing in Malaysian SMEs.	0.000	Accepted	.244
H₄	There is a significant positive relationship between company size and the implementation of activity based costing in Malaysian SMEs.	0.028	Accepted	.152

5. Discussion and Conclusion

This research was conducted to study the relationships of the external environment, cost saving mechanisms, user attitude and company size on the implementation of ABC among SMEs in Malaysia. The research findings revealed that all four factors have a significant positive relationship on the implementation of ABC among SMEs in Malaysia. In this study, the external environment produced a significant positive association with the implementation of ABC as per previous studies (Elhamma & Zhang, 2013; Kraus et al., 2013; Rios et al., 2014; Zhang & Isa, 2010). The findings would hopefully create awareness among the Malaysian Government, the accounting profession as well as public and private sector that appropriate policies should be developed and implemented to encourage SMEs to use factors such as the external environment to allow SMEs to stream line activity outputs when competing with other business units/rivals.

Cost saving mechanisms has a positive significant association with the implementation of ABC similar to the findings of Cagwin and Bouwman (2002) and James (2013). SMEs should be encouraged to incorporate cost saving techniques like JIT and TQM to improve the success of the ABC system to allow for continuous improvement. The TQM technique could be used to support ABC in generating data of value-added and non-value-added quality related activities, hence allowing for the detection of improvement possibilities in

products and services of SMEs. As with the JIT system which reduces the amount of money invested in inventory of raw material and finished goods, the ABC system would allow strict control to be exercised on certain materials that have higher value and also reduce the cost of storage.

As per previous research, this study has also found that user attitude has a positive significant relationship with the implementation of ABC among SMEs (Khozein & Dankoob, 2011; Dubihlele & Rundoro, 2014). Human capital development is essential for SMEs to provide them with the necessary knowledge, skills to employees to change user attitude and allow for a better usage of the ABC system in SMEs. Lastly, company size has a positive significant association with the implementation of ABC in SMEs similar to the findings of Elhamma (2012) and Pokorná (2016). As a company size grows and diversification takes places, it is important to implement ABC to better understand both customer and product profitability. According to Devine, Lammert and O'Clock (2005), it was proposed that the extension of the ABC system such that assets are also assigned to activities is with the aim of allowing managers to analyse customers and products with the same attention to return on investment that has been used for evaluating business units. Through this a growing company size company size would have a better impact on the implementation of ABC among SMEs.

There are a few limitations in this study, firstly the study could have included other states in Malaysia especially Johor and Penang which has the second and third highest number of SMEs in Malaysia (Department of Statistics Malaysia, 2016). The study may have also included other internal or external factors that may affect the implementation of ABC among SMEs in Malaysia. As such, recommendations are proposed to future researchers. Firstly it is suggested that future research should have a broader based population that includes other states in Malaysia. Also other factors such as leadership and technology advancement should be included as these factors may also have an effect on the implementation of ABC in SMEs (Khozein & Dankoob, 2011).A longitudinal study to examine the importance of these factors on the implementation of ABC in SMEs is also recommended. The results of this research will contribute to current studies on factors that affect the implementation of ABC in SMEs. The results would hopefully influence the government and policy makes that these factors are important to the implementation of ABC among SMEs in Malaysia. Furthermore, the researchers believe that the results of this study will allow economist and accountants to gain new knowledge on the factors that affect the implementation of ABC on SMEs.

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The Mediating Effect of Innovation on Entrepreneurial Competencies and Business Success in Malaysian SMEs

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Abstract

The purpose of this paper is to explore the extent of entrepreneurial competencies and innovation on business success in SMEs in Malaysia. Specifically, this study tested the mediating role of product innovation and process innovation between the relationship of entrepreneurial competencies and business success. The statical sample population of this research includes 407 owner and manager involved in SMEs, both manufacturing and services & other sectors. For data collection, a standard questionnaire using seven-point Likert scale and 72 items was used to evaluate 12 entrepreneurial competencies (strategic competency, commitment competency, conceptual competency, opportunity competency, organising and leading competency, relationship competency, learning competency, personal competency, technical competency, familism competency, ethical competency & social responsibility competency), seven items for innovation (product & process innovation) and, ten items for business success (financial & non-financial). Four hypotheses were developed in this study. The SPSS version 21.0 and Structural equation model (SEM)-AMOS version 21.0 techniques were used. The findings indicate that there is a positive and significant relationship between the entrepreneurial competencies and innovation on business success in SMEs. Moreover, there is a positive and significant relationship between all dimension of competencies and business success. The product innovation and process innovation served as partial mediator between entrepreneurial competencies and business success. Limitations and implications for future studies are discussed.

Keywords: entrepreneurial competencies, innovation, business success, SMEs, Malaysia

1. Introduction

In developing country like Malaysia, SMEs are seen as a mechanism to improve the distribution of income, to stimulate economic growth, and to reshape an economic structure which has been highly depending on the activities of large firms (Mohsin, Halim, Ahmad, & Farhana, 2017; Murjan, 2012). This is seconded by Prime Minister of Malaysia claimed that SMEs are the backbone of Malaysian economy (SME Annual Report, 2017). Approximately 99.3 % of business established in Malaysia are SMEs (Ndubisi & Salleh, 2006). However, they contributed only 31% to Malaysia's Gross Domestic Product (GDP), which is relatively small compared to other countries (Nambiar, 2009).

The contribution of SMEs to GDP's Malaysia has shown an increased trend each year from 33.0% in the year 2012 to 36.6% in the year 2016 (SME Annual Report, 2017). In others ASEAN country, the contribution of SMEs towards GDP is more significant compared to Malaysia. SMEs in Indonesia contributed 59% (Asian Development Bank, 2017) and in Singapore, 99% of their business established are SMEs with total number 180,000 enterprises which contributed 49% to GDP and employed 70% of Singapore's workforce (Ministry Trade & Industry of Singapore, 2012). Given that increasing the chances of success among SMEs would huge implications for the growth and socio-economic wellbeing of a country (Asia-Pacific Economic Cooperation [APEC], 2004), understanding predictors of success in SMEs is critical.

Lopa and Bose (2014), suggested that in the long run, entrepreneurs should focus on entrepreneurial competencies for business survival and better future business success. This is consistent with a study done by

Central Bank of Malaysia (2003) urged that entrepreneurial spirit possessed by entrepreneurs and good programme for human resource development give an impact to SMEs business success (Central Bank of Malaysia, 2003; SME Corp Survey, 2010). Sánchez (2012) suggested that entrepreneurial competencies have an impact on business success. Entrepreneurial competencies are a significant contributor to a firm's success. In Malaysia perspective, Ahmad, Ramayah, Wilson, & Kummerow (2010) suggested that entrepreneurial competencies were strong predictors of business success and it was found that the association between entrepreneurial competencies and business success was more strongly evident in hostile and dynamic environments than in more benign and stable environments, however more studies should be conducted. Thus, this paper attempts to investigate the relationship of the entrepreneurial competencies on business success with the inclusion of innovation as mediating effect. As SMEs, the innovation is highly recommended and it is thefore interesting to explore how entrepreneurial competencies and innovation enhance firm's success.

2. Literature Review and Conceptual Framework

Alvarez and Busenitz (2001), claimed that Resource Based Theory (RBT) and entrepreneurship involve the founders/owners unique awareness of opportunities, the ability to acquire the resource needed to exploit the opportunity, and the organisational ability to recombine homogeneous inputs into heterogeneous outputs. Barney (1991) urged that the entrepreneurial competencies are the key sources belong to entrepreneurs (people), and people are human capital that categorised as an intangible asset of firms that enable them to be more successful. Entrepreneurial competencies referred as the underlying characteristics such as traits, self-image, specific knowledge, motives, social roles and skills that lead to venture, survival its growth (Bird, 1995). Ahmad et al. (2010) suggested that entrepreneurial competencies such as the behaviour, skill, knowledge and attitude possesed by entrepreneurs themself were the factors that determine the success of the business. Whereas Sa'ari, Adenan, Hashim, and Jamaludin (2013) defined them as a cluster of the set of related knowledge, attitudes, and skills of entrepreneurs to produce performance and maximise profit.

Many positive relationships between entrepreneurial competencies and performance have been noted by a number of researchers (Al-Damen & Ali, 2015; Xiaogang & Xinchun, 2005; Tanoira & Valencia, 2014). Entrepreneurial competencies are also connected directly to better export performance (Ibeh, 2003), and success in terms of firm size and economic growth (Tang, Wang, & Zhang, 2007). Studies have also found a positive effect of entrepreneurial competencies on the growth of small firm (Gurbuz & Aykol, 2009) and profitability of non-state firms in China (Xiaogang & Xinchun, 2005). Some scholars suggested that entrepreneurial competencies are needed to start a business (Tatar, 2013), while managerial skills much needed during growing stage. A study was done by Man (2001) identified eight domains of entrepreneurial competencies namely; strategic, commitment, conceptual, opportunity, organising & leading, relationship, learning and personal. Another scholar, Chandler & Jansen (1992) urged technical competency as one of the entrepreneurial competencies. This domain was extended by Ahmad (2007) urged that ethical, social responsibility and familism as part of entrepreneurial competencies.

A recent study by Kazemi, Rasekh, and Navid (2016) in Iran revealed that there is a positive and significant relationship between the variables of competencies (strategic, relationship, conceptual, personal, opportunity, learning, ethical, and familism) and innovation. Results in that study also claimed that 77% innovative change as fostered by entrepreneurial competencies indicative of a strong impact of the entrepreneurial competencies on innovation and performance of enterprises. Strategic competency was the major influenced among the all entrepreneurial competencies towards innovation. Another study done in West Midlands, U.K based on 245 manufacturers in SMEs revealed that technical competency, strategic competency and, organising and leading competency was percieved as most important factors to improve innovation in the firms (Freel, 1999).

Given the circumstances today, innovation is accepted as a necessity and is a vital resource for a firm's sustainability and growth (SME Master Plan 2012-2020; Varis & Littunen, 2010). Innovation is useful as its benefits exceed the cost of the resources to implement it (Niera, Lindman, & Fernandez, 2009). A recent study was done by Ilker and Birdogan (2011), product innovation and process innovation have a strong and positive relationship in determining the business success in SMEs. In manufacturing sector in Malaysia show that innovation has a positive relationship with business success and the entrepreneurs were suggested to focus more on innovation to enhance the customer's satisfaction (Mohsin, et al., 2017).

Previous researchers found that the SMEs are often more innovative than large firms (Afuah, 2003). SMEs tend to respond efficiently to customer needs than larger organisations (Berthon, Ewing, & Napoli, 2008), as they are more flexible (Acs & Audretsch, 1988). SMEs' innovative capabilities contribute to valuable economic and social contributions. In Malaysia, innovation is increasingly important and focus as one of the key areas under

Malaysia SME Master Plan 2012 – 2020 (SME Master Plan 2012-2020). Based on The Global Innovation Index 2015 issued by World Intellectual Property Organisation (WIPO, 2015), Malaysia was ranked number 32 in innovation performance compared to 141 countries. There are four domains of innovation in SMEs; product innovation, process innovation, organisation innovation, and market innovation (Varis & Littunen, 2010). However, product and process innovation were the most frequently employed domains in innovation study in SMEs (Tang, 2006; Wang & Ahmed, 2004). According to Ilker and Birdogan (2011), product innovation and process innovation have a strong and positive relationship in determining the business success in SMEs. Figure 1 displayed the conceptual framework for this study.
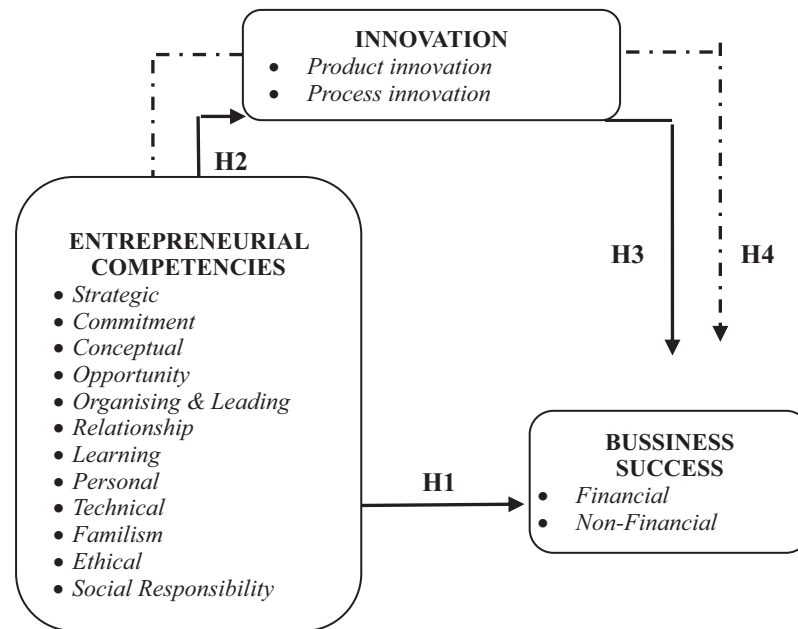
Note: ———▶ indicate direct effect, – · – ▶ indicate mediating effect

Figure 1. The Conceptual Framework of Study

3. Hypotheses Developed

Entrepreneurial Competencies and Business Success

An entrepreneurial competencies responds to Ahmad et al. (2010), Vijaya et al. (2015), Umeze and Ohen (2015), and, Castellanos, Merino, and Zambrano (2011) suggested that there is a significant impact of entrepreneurial competencies and business success. Strong entrepreneurial competencies shown by entrepreneurs will lead to better business success in terms of business growth, sales performance, revenue, market share, return on investment, quality of products and self-satisfaction.

Hypothesis 1. Entrepreneurial competencies have a significant impact on business success.

Entrepreneurial Competencies and Innovation

Bougrain and Haudeville (2002) found that in the previous century, 60% of the innovations were in the SME sector, but many of them were not successful due to lack of professionalism and inability to collaborate with other enterprises. Kazemi et al., (2016) found a significant positive impact of entrepreneurial competencies on innovation.

Hypothesis 2. Entrepreneurial competencies have a significant impact on innovation.

Innovation and Business Success

The organisation's ability to innovate and provide a solution to satisfy customer needs could improve its performance (Weerawardena, 2003). Innovation is accepted as a necessity, and it is a vital resource for firms' sustainability and growth, and to ensure SMEs' success in long-term (Murjan, 2012; Rosenburch et al., 2011).

Hypothesis 3. Innovation has a significant impact on business success.

Innovation as a Mediator

Nasuredin, Halipah, and Shamsudin (2016) that entrepreneurial competencies affected the business success in SMEs. Rosenbusch et al. (2011) urged that innovation has a positive effect on SME performance and business success. Innovation is useful as its benefits exceed the cost of the resources to implement it (Niera et al., 2009), and Kazemi et al. (2016) found a significant positive impact between innovation and entrepreneurial competencies.

Hypothesis 4. Innovation mediates the relationship between entrepreneurial competencies and business success.

4. Research Methodology

The present descriptive study is correlation types an utilizes a regression analysis (SEM) and falls into the category of empirical research. As the study variables need to be evaluated and their impact is measured for each outcome, and as the outcome are to be applicable for a large group of observations, the quantitative approach is adopted for this study. Moreover, as the data were collected at one specific point of time, it is considered a cross-sectional study. The number of subjects in the population that meets the definitions in Malaysian SMEs consists of 47,698 in manufacturing sectors and, 859,367 in services and other sectors (Economic Census, 2016). However this study was conducted in Klang Valley and Selangor because of its energetic and dynamic economic activities that give benefits to the growth of SMEs in the region consists of Kuala Lumpur and its suburbs, and adjoining cities and town in the state of Selangor (Suhaimi et al., 2015)**.**

As a questionnaire was used as a data collection instruments. In order to evaluate entrepreneurial competencies, innovation and business success, we used the questionnaires of entrepreneurial competencies developed by Man (2001) 52 items, Ahmad (2007) 16 items and, Chandler & Jansen (1992) 4 items; innovation by Szymanski and Henard (2000) 4 items and, Murjan (2012) 3 items; business success by Chandler & Hanks (1993) 5 items and, Hoque (2004) 5 items. Items statements in the variables sections are measured as subjective estimates using a seven-point Likert scale (with 1=strongly unimportant to 7=strongly important for entrepreneurial competencies, and 1=strongly disagree to 7=strongly agree for inovation and business success).

The Composite Reliability (CR), and Average Variance Extracted (AVE) were used to measure reliability and validity. Table 1 presents the composite reliability and validity for each construct of the entrepreneurial competencies, innovation, and business success. According to Awang et al. (2015) and Hair, Babin, and Krey (2017), the acceptable value for CR and AVE is 0.70 and 0.50 respectively. The higher value of CR and AVE, the more reliable and valid of the construct to be tested. In this study, all constructs are satisfied since the value for CR and AVE are greater than the recommended value. Specifically, the range value for CR is between 0.846 and 0.920, and value for AVE for each construct was fall between 0.568 and 0.715.

Table 1. Composite realibility

Construct	CR	AVE
Business Success	0.933	0.874
Financial	0.881	0.596
Non-Financial	0.881	0.598
Entrepreneurial competencies	0.940	0.883
Familism	0.879	0.593
Technical	0.856	0.597
Opportunity	0.846	0.579
Relationship	0.871	0.575
Ethical	0.888	0.570
Conceptual	0.887	0.568
Learning	0.875	0.583
Personal	0.910	0.590
Social Responsibility	0.848	0.582
Organising & Learning	0.920	0.589
Strategic	0.908	0.585
Innovation	0.938	0.884
Process	0.829	0.619
Product	0.909	0.715

Table 2 showed the value of construct correlations and Square Root Average Variance Extracted (SQAVE). The discriminant validity is considered satisfied when the value of SQAVE (bold value) is greater than the value of construct correlation as recommended by Hair et al., (2017) and, Fornell and Larcker (1981). Apart from that, the value of construct correlations must be below than 0.85. Therefore, this discriminant validity was satisfied and can proceed to test the hypotheses between constructs involved in the current study.

Table 2. Discriminant Validity

Construct	Entrepreneurial Competencies	Innovation	Business Success
Entrepreneurial Competencies	**0.939**		
Innovation	0.56	**0.940**	
Business Success	0.53	0.54	**0.938**
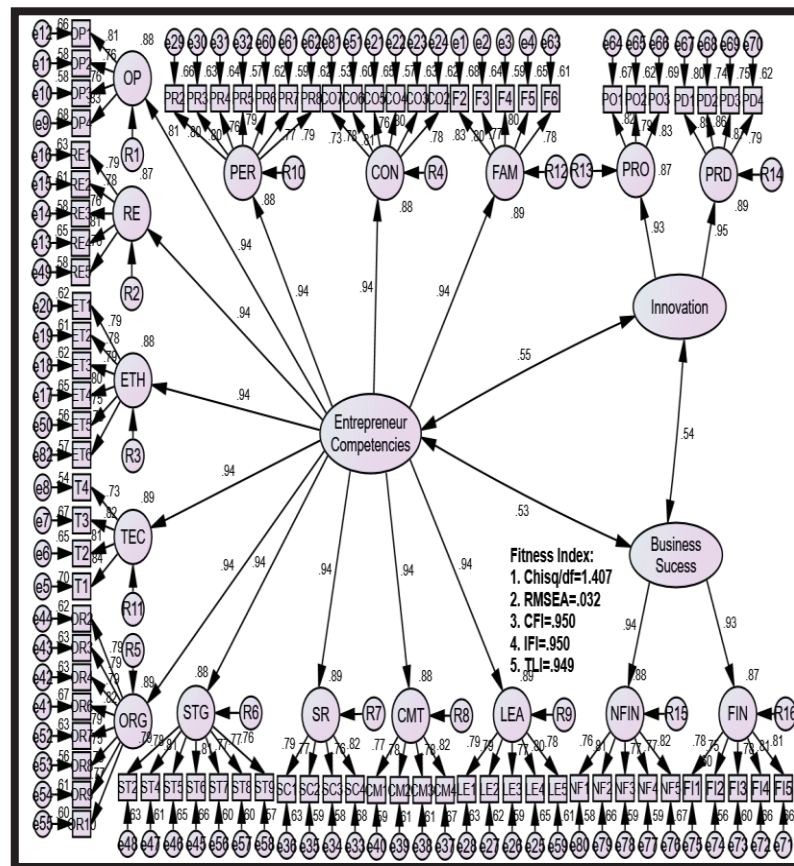
Note. FIN = Financial, N-FIN = Non Financial, FAM = Familism, TEC = Technical, OP = Opportunity, RE = Relationship, ETH = Ethical, CON = Conceptual , LEA = Learning , PER = Personal, SR = Social Responsibility, ORG = Organising & Learning , STG = Strategic, PRO = Process Innovation, PRD = Product Innovation

Figure 2. Pool CFA

In addition, all the fitness index for pooled CFA were achieved as suggested by Hair et al. (2017) as displayed in Figure 2. Specifically, the absolute fit represented by RMSEA = 0.032 < 0.08; incremental fit represented by CFI = 0.950, TLI = 0.949, and IFI = 0.950; and parsimonious fit represented by Chisq/df = 1.4047 < 3.0.

The normality assessment can be identified by skewness analysis which is all items must fall between -1.5 to 1.5 (Awang, 2015) and the kurtosis acceptable value for kurtosis is in the range between -3.0 to 3.0 (Lowry & Gaskin, 2014). In this study, the skewness is between -1.5 to .28 and kurtosis between -.44 to .39. Moreover, multivariate of kurtosis identified 1.835 which is lower than 50.0 as recommended value by Awang (2015).

5. Research Findings

In this study majority of the respondents (89.7%) were males, while the rest (10.3%) were females. With respect of races, majority of the respondents were Malay (54.3%), Chinese (40.3%), Indian (4.4%) and other races (1%). As regards age, that the majority of the respondents (45.2%) fall within the range 41-50 years and followed by 51-60 years (40.3%). Moreover, 45.2% of the owner/managers went into business venturing in the age of 41-50 years. With respect to education level, 43% of the owners/managers of SMEs were degree holders, 39% diploma holders, 9% certificate holders, 5% high school, 4% master holders, and 1% had a Ph.D./Doctoral qualification.

With respect to working experience prior running the business, almost all respondents (92.9%) had working experience prior running the business and 7.1% respondents only had no previous working experience. It is reported that majority of the respondents have start-up experience (57.7%) and 42.3% of the entrepreneurs have no prior business start-up experience. With respects to firm type, 11.3% of the respondents reported that their business is operating in manufacturing, 86.0% in the services and 2.7% in other sector.

Hypothesis 1. Entrepreneurial competencies have a significant impact on business success.

From Table 3, the regression weight estimate of 0.190 has a standard error of 0.051. The critical ratio is shown as 3.742 standard errors above zero. The probability of getting a critical ratio of 3.742 in an absolute value is 0.001. Therefore, the hypothesis that entrepreneurial competencies have a positive and significant effect on business success is highly supported.

Hypothesis 2. Entrepreneurial competencies have a significant impact on innovation.

From Table 3, the regression weight estimate of 0.198 has a standard error of 0.013. The critical ratio is shown as 15.650 standard errors above zero. The probability of getting a critical ratio of 15.650 in an absolute value is 0.001. Therefore, the hypothesis that entrepreneurial competencies have a positive and significant effect on innovation is highly supported.

***Hypothesis 3. Innovation has a significant impact on business success.***

From Table 3, the regression weight estimate of 1.035 has a standard error of 0.226. The critical ratio is shown as 4.576 standard errors above zero. The probability of getting a critical ratio of 4.576 in an absolute value is 0.001. Therefore, the hypothesis that innovation has a positive and significant effect on business success is highly supported.

Table 3. Regression Weight

			Estimate	S.E.	C.R.	P	Result
Business Success	<---	Entrepreneurial Competencies	.190	.051	3.742	***	Significant
Innovation	<---	Entrepreneurial Competencies	.198	.013	15.650	***	Significant
Business Success	<---	Innovation	1.035	.226	4.576	***	Significant

Hypothesis 4. Innovation mediates the relationship between entrepreneurial competencies and business success.

In this study, Baron and Kenny Approach is used to test the mediator. The indirect effect of this model taken from standardized model is 0.36 (0.84 x 0.43) which is the product coefficient between entrepreneurial competencies on innovation, and innovation on business success as per Figure 3. The direct effect is 0.33 that is the beta estimate from entrepreneurial competencies and business success. The mediation effect is said significant when the direct effects are significant. In this case, the mediation effect occurs in this model. In order to compute the z-test, the value of indirect effect should be significantly different from zero or must greater than the direct effect. The indirect effect for this model is 0.36 which is greater than the direct effect which 0.33 (Figure 4). According to Iacobucci, Saldanha, and Deng (2007) and, Baron and Kenny (1986), the partial mediation is said exist when the direct effect is significant. If the direct effect is reported not significant, then, full mediation occurs. In this case, direct effect was significant and therefore the type of mediation for this model is partial mediation.
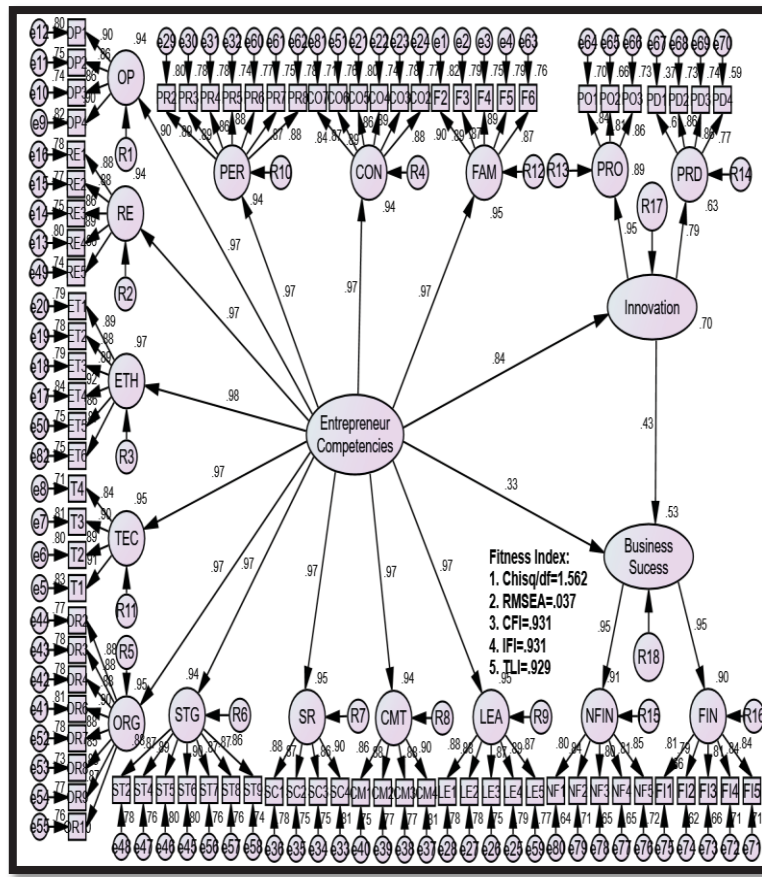
Note. FIN = Financial, N-FIN = Non Financial, FAM = Familism, TEC = Technical, OP = Opportunity, RE = Relationship, ETH = Ethical, CON = Conceptual , LEA = Learning , PER = Personal, SR = Social Responsibility, ORG = Organising & Learning , STG = Strategic, PRO = Process Innovation, PRD = Product Innovation

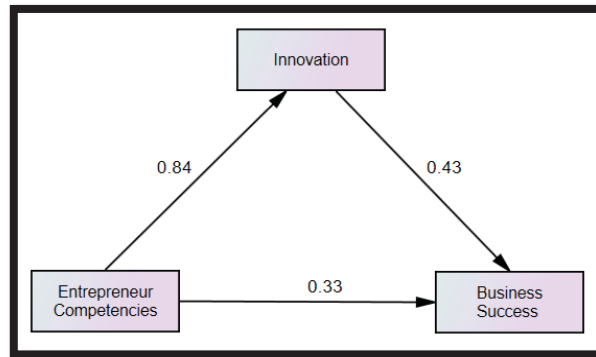Figure 3. Structural Standardized Model

Figure 4. Testing Mediation

In order to varify the results, researchers conducted bootstrapping as per Table 4. The result for bootstrapping estimates and p-value was obtained by the application of AMOS output. The regression weight estimate for indirect effect (a x b) is 0.359. The probability of getting a bootstrap p-value for indirect effect is 0.002, it means is that the regression weight for innovation as mediator construct is significant at 0.05 level, hence, the hypothesis that innovation has mediates the relationships between entrepreneurial competencies and business success is highly supported. The regression weight for direct effect is 0.332. The probability of getting bootstrap p-value for direct effect is 0.002 (p-value < 0.05). Therefore, it can be concluded that the type of mediation for this model is partial mediation because the significant effect existed in the direct effect. The results from bootstrapping application are consistent with Baron and Kenny approach.

Table 4. The Result of Direct and Indirect Effect of Entrepreneurial Competencies, Innovation, and Business Success

	Indirect Effect	Direct Effect
Bootstrapping Estimate	0.359	0.332
Bootstrapping P-Value	0.002	0.002
Result	Significant	Significant
Type of Mediation	**Partial Mediation**	

6. Discussion

The aim of this paper is to evaluate the effect of entrepreneurial competencies and innovation on business success in SMEs. The results showed that there is a positive and significant relationship between entrepreneurial competencies and business success, entrepreneurial competencies and innovation and, innovation and business success. The results are consistent with studies done by Kazemi et al., (2016), Mugewa (2013), and Sa'ari et al., (2013). Moreover from this study proved that innovation acting as partial mediator between entrepreneurial competencies and business success. In light of this study, it can be concluded that entrepreneurial competencies significantly effecting the innovation particularly product and process innovation in SMEs, and finally led to business success.

From the study, its found that twelve entrepreneurial competencies; strategic competency, commitment competency, conceptual competency, opportunity competency, organising and leading competency, relationship competency, learning competency, personal competency, technical competency, familism competency, ethical competency and social responsibility competency has a positive and significant effect on business success (financial and non-financial) of SMEs in Malaysia. This means, the entrepreneurs who possess a higher level of entrepreneurial competencies generally perform better than those with lower competencies specifically in SMEs in Malaysia.

The finding from this study is consistent with the results of the study by Nasuredin et al., (2016) that entrepreneurial competencies affected the business success in Malaysian SMEs. Opportunity, organizing, and strategic competency has a significant effect towards SMEs performance will perform better or succeed in their businesses, while other competencies such as relationship competency, conceptual competency, and commitment competency were less influence towards business success (Nasuredin et al., 2016). To date, even though significant relationship were found between entrepreneurial competencies and SMEs performance, supporting the findings by Man, Lau and Snape (2008) suggested that the competence needed are different according to levels of management, sector, and organization.

It also found in this study that there is a positive and significant relationship between the conceptual competency and innovation. Based on the concept of conceptual competency, it is clear that is essential to study and survey new ideas, take risks, and understand the business concept in order to foster innovation. A recent study in sport organisations in Iran revealed that there is a positive and significant relationship between the variables of competencies (strategic, relationship, conceptual, personal, opportunity, learning, ethical, and familism) and innovation (Kazemi et al., 2016). Results in that study also claimed that 77% innovative change as fostered by entrepreneurial competencies indicative of a strong impact of the entrepreneurial competencies on innovation and performance of enterprises. Strategic competency was the major influenced among the all entrepreneurial competencies towards innovation. The positive and significant relationship between learning competency and innovation indicate that organisational learning provides a context and the requirements for the occurrence of innovation, hence improved business performance and competitive advantages (Kazemi et al., 2016).

Another study done in West Midlands, U.K based on 245 manufacturers in SMEs revealed that technical competency, strategic competency and, organising and leading competency was perceived as most important factors to improve innovation in the firms (Freel, 1999). SMEs are considered to be more innovative due to their flexibility, higher ability to adapt and improve, and they are quick movers in implementing changes. Innovation is a tool for SMEs to remain competitive and achieving higher performance (Darroch & McNaughton, 2002). In response to changing market conditions, SMEs are able to adapt, develop new ideas, an improved existing products/services whether through major, expensive change or subtle changes as such as extensions to existing products lines (Gehlar, Regmi, Stefanou, & Zoumas, 2009). In order to survive, SMEs must adapt to a changing industry by becoming accustomed to technological advances and create new products/services from time to time.

From this study, when product and process innovation is considered in the relationship between entrepreneurial competencies and business success, it improves the financial and non-financial success of SMEs. Innovation has yet examined as a mediator in the relationship between entrepreneurial competencies and business success (Umar & Hashim, 2017; Umar & Ngah, 2016), therefore no comparison is available. However, the mediating

effect of innovation is supported by other studies in SMEs such as between market orientation and business performance (Mahmoud et al., 2016) and, entrepreneurial orientation and business performance (Keea & Rahman, 2017).

7. Conclusion

This research would benefit the owner/manager of SMEs in creating an awareness of the factors that have influence on SMEs success. The entrepreneurs should be equipped with knowledge about the potential impact of their own behaviour towards the way they are operating the business. The findings of the study may give insight idea to entrepreneurs in SMEs by identifying the focus on training that might be necessary to improve the effectiveness and efficiency of business. From theoritical implication, this study highlighted the innovation served as mediator variable between entrepreneurial competencies and business success.

However, there was limitations with the design of the data collection. This study applied self‑report as the source of all data. This approach, even though criticised by some, was deemed necessary because of difficulties associated with the independent assessment of each of these variables. Secondly, language choice chosen for this study posed another limitation as the survey instruments used Malay and English language. Thus, this study would have attracted more participation from Chinese entrepreneurs if the survey instruments were also available in Chinese as Malaysia is multi racial country.

For future studies the suggestion is a gender gap. It is interesting aspect of investigation would be undertaking a comparative study to ascertain whether or not there are gender differences in competency requirements. The suggestion has been made that men and women entrepreneurs manage their business somewhat differently (McGregor & Tweed, 2001).

In conlusion, the business success in SMEs can be enhanced starting with entrepreneurial competencies, and through innovation. As the fitness index was satisfied, this research can be generalise to all SMEs regardless the status of nations.

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Organizational Commitment of Non-Profit Organization Volunteers: A Study on the Save Street Child (SSC) Organization in Malang City, Indonesia

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Abstract

Save Street Child (SSC) is a nonprofit organization in which its main activity is focused on the empowerment of the street children. This research aims at analyzing the effect of organizational culture on organizational commitment, analyzing the job satisfaction as the mediating variable of the organizational culture's influence on the organizational commitment, and analyzing the volunteering tenure as the moderating variable of the organizational culture's influence on the organizational commitment. This research involved all of 63 volunteers in SSC organization in Malang City as respondents. Closed questionnaires were used to collect the primary data. Further, the data were analyzed by using the PLS (Partial Least Square). The research results show that the organizational culture affects the job satisfaction, whereas the organizational culture does not have any influence on the organizational commitment. In addition, the job satisfaction influences the organizational commitment, and it also becomes the mediating variable of the influence of the organizational culture on the organizational commitment. The last finding also shows that the volunteering tenure is not the moderating variable of the organizational culture's influence on the organizational commitment. This study is useful for understanding organizational culture, job satisfaction, and organizational commitment in nonprofit organizations.

Keywords: organizational culture, organizational commitment, job satisfaction, volunteering tenure, save street child, nonprofit organization

1. Introduction

In this globalization era, non-profit organization has an important role in resolving many social problems. One of the non-profit organization which engages in the community service is Save Street Child. Its presence has covered some big cities in Indonesia, including Malang. Save Street Child (SSC) is a non-profit organization in Malang focusing on street children. Its main activity is the empowerment of street children involving advising and educating them to realize and change their habitual activity of earning the life on the street.

SSC organization is driven by volunteers; thus its existence depends much on its volunteers. The volunteer is an individual who has high concern on the problems faced by people in his/her surrounding without asking anything in return. Hodgkinson (2003) states that volunteers even engage in overcoming environmental and society various problems either in government organizations or companies. Therefore, to be able to perform their function well, volunteers need to have high commitment.

Volunteers' organizational commitment has close connection with the values or the organizational culture, and also the volunteers' satisfaction in conducting their social activities. A strong organizational culture is expected to be able to elevate the volunteer's commitment to remain to stay and not to leave the organization. The strong organizational culture will be able to increase the job satisfaction of the organizational members (Dirani, 2009; Macintosh & Doherty, 2010). Furthermore, the organizational members who have obtained job satisfaction will also hold a high commitment. It is in line with the results of the researches conducted by Zeinabadi & Salehi (2011), Prabowo et al. (2016) who state that the job satisfaction affects the organizational commitment. In addition, studies conducted by McKinnon et al. (2003) and Al-Amin and Noermijati (2010), show that the organizational culture influences the organizational commitment. In contrary to the results of the empirical

studies above, Jain (2015) shows that sociability and solidarity culture does not have any correlation to the continuance commitment.

On the basis of the previous empirical research results, this study has a research gap which differs it from others. This study uses the job satisfaction as the mediating variable. This gap refers to the statement that the strong organizational culture will increase the job satisfaction of the members (Dirani, 2009; Macintosh & Doherty, 2010). Meanwhile, every organizational member who have already perceived the job satisfaction, will also hold a high commitment (Zeinabadi & Salehi, 2011; Prabowo et al. 2016). In addition, this study also takes the volunteering tenure as the moderating variable of the influence of the organizational culture on the organizational commitment. This moderating variable is used to find out whether the time period of being a volunteer in SSC will strengthen or weaken the effect of the organizational culture on the volunteer's organizational commitment. Robbins and Judge (2013) state that the volunteering tenure can be a strong predictor of the volunteer's intention to leave. It can also be inferred that the longer of the members pursue certain works, the higher the members' commitments will be on the organization. Therefore, this study intends to disclose whether the same hypothesis will also work on the volunteers of the non-profit organization or not. Moreover, the originality of this research focuses on the volunteer commitment, and put the volunteering tenure as the moderating variable of the effect of the organizational culture on the volunteer's organizational commitment.

The paper is organized as follows: The next section provides a review of the theoretical literature, some previous study, and sets out the hypotheses of the study. The research methods are presented in the section 3. The next section results of statistical analysis are presented followed by conclusion and managerial implications in section 5.

2. Literature Review

2.1 Organizational Culture

According to Robbins (2006), the organizational culture is defined as a perception held by all the organizational members or the shared meaning of the system which is considered as the characteristics set adopted by an organization. Kotter dan Heskett (1997) state that the organizational culture has two levels, which are: the first, a deep and less visible level which is an organizational culture refers to the shared values among the organizational members which also tend to persist over time; meanwhile, for the second refers to more visible level in which a culture portrays organization's behavior or pattern, so that it is expected that new members automatically feel supported to follow their co-workers. Moreover, Luthan (2006) defines the organizational culture as a norm and value directing the organizational member behavior. In addition, Schein (2010) also states that the organizational culture is a glue between the members and organizational system that held together and stimulates the members' commitment and performance. Basically, a culture is the totality of social behavior patterns, arts, beliefs, and institutions; while the essence of the organizational culture is a norm of act of the organization as well as its members. The strong culture affects the members to be embedded with the organization's goals and work together to achieve the goals. It also notifies the members of how things are done and what things are important to do. The study of Lok dan Crawford (2004) disclose that there is a correlation of the organizational culture on the job satisfaction and organizational commitment. Meanwhile, another research conducted by Nurjanah (2008) aimed at finding out the influence of the leadership style and organizational culture on the organizational commitment and employee performance. The result shows that the organizational culture has a significant and positive effect on the organizational commitment. Other previous studies from McKinnon et al. (2003); Zain et al. (2009); Al-Amin and Noermijati (2010) also show that the organizational culture has an effect on the organizational commitment.

Furthermore, Cartwright (1999) state that a culture has a strength and authority to create personality, behavior, and attitude characteristics of an individual. Based on Cartwright (1999), it can be inferred that the organizational culture has an influence in forming the individual personality, behavior, and attitude. In order to measure the organizational culture, Cartwright found nine motivation factors which also become a base of the culture measurement/indicator, which are Identification, Equity, Equalit, Consensus, Instrumentality, Rationality, Development, Group Dynamics, Internalization.

The organizational culture in SSC is measured by using indicators adopted from Cartwright and other indicators that fit the condition of the research object. The indicators consist of: (1) equity: the balance between the aqcuired reward and experience and the volunteer's desired; (2) equality: the equal treatment and respect among volunteers, regardless of status, seniority, and the contribution made; (3) communication: the relationship conducted through communication among volunteers; (4) Empathy: there is more understanding and caring among volunteers; and (5) technology: the use of the application and socal media to assist the coordination, take

decision, and disseminate information to other volunteers.

2.2 Job Satisfaction

According to Robin and Judge (2013), the job satisfaction is a positive feeling of certain works resulted from the assessment of the work characteristics. An employee with high job satisfaction has a positive assessment or feeling towards his/her job, it also happens vice versa. Meanwhile, Flannery et al. (2008) states that the job satisfaction is an individual attitude towards his/her job reflected as a self-attitude on the tendency and response of the job being done at the level of pleasure or displeasure. This self-attitude refers to either the visible or invisible individual attitude. Locke (1970) published a job satisfaction theory well-known as Range of Affect Theory which describes that the employee job satisfaction is measured through the wishes differentiation of which the employees earn from their job. Parker (2007) mentions the three matters are known to lead to the job satisfaction: job situation, employee characteristics, and the result of the employee interaction.

Locke (1970) states that there are five indicators of the job satisfaction: The Work Itself, Pay, Promotion Opportunities, Supervision, Coworkers. In correlation to the volunteer job satisfaction, there is a high expectation of the volunteers to be able to fulfill their desire that is by working better as the volunteers, receiving rewards of what they have done, and developing themselves. Considering these, it needs an adjustment of the job satisfaction indicators. Therefore, referring to the five job satisfaction indicators proposed by Locke (1970), the two indicators are considered being adjusted based on the condition of the research object which is to measure the job satisfaction of the volunteers in SSC Malang. Indicators of the volunteer job satisfaction are as follows: (1) The Work Itself: how far the voluntary work provides chances to volunteers to have interesting work, opportunity to learn, and opportunity to accept responsibility; (2) Appreciation: rewards received by volunteers for their contribution to the organization; (3) Development Opportunities: the opportunities for volunteers to develop; (4) Supervision: the capability of the supervisor or division coordinator to provide technical and moral supports for volunteers; (5) Coworkers: coworkers have a great role in creating a conducive working environment and high job satisfaction.

2.3 Organizational Commitment

Luthan (2006) states that organizational commitment is an attitude showing the loyalty of employees and considered as a continuous process of how the members of the organization express their interest on the success and the good of the organization. Furthermore, the loyalty is indicated through three important matters which are: 1). the strong desire of the individual to stay as an organizational member; 2) the desire to exert the efforts for the sake of the organization; 3). the belief and strong acceptance on the aims and values of the organization. Allen and Meyer (1991) define organizational commitment as a psychological construct portraying the relationship between the members of the organization and their organization, and having implications on the individual decision to continue their organizational membership. Allen and Meyer (1991) also introduce a model named Three Component Model (TCM) including affective commitment; continuance commitment; normative commitment. Furthermore, the three components become the measurement indicators of the organizational commitment variable in this study.

Organizational commitment can be expressed as a sense of emotional attachment of the individual / members in an organization which allows them to prefer to keep remaining in the organization than those who have no involvement to the organization. The members who have high commitment also have a strong involvement. In addition, the organizational members who also have high commitment will have more possibilities to stay than those who have no commitment. A study conducted by Puspitawati (2013) aimed at disclosing the influence of job satisfaction on the organizational commitment and service quality at Hotel Bali Hyatt Sanur. The results show that the job satisfaction positively and significantly affects the organizational commitment. Moreover, the organizational members who obtain the job satisfaction will also have a high commitment. These results are in line with the studies conducted by Zeinabadi & Salehi (2011); Fraga et al. (2015); Prabowo et al. (2016) disclosing that the job satisfaction effects the organizational commitment.

2.4 Volunteering Tenure

The length period of being volunteers is also considered identic to the volunteering tenure. Tenure can be defined as a working time at a certain position or also as a job experience (Robin & Judge, 2013). Tenure refers to how long an individual pursues a particular occupation meaning that the longer the person stays working in certain position, the more experience he/she will get. English et al. (2010) divide the working period into three stages, which are early, middle, and later stage. The research results of English et al. (2010) show that at certain different tenure stages, it is found that there is also a different strength of affective commitment. Noermijati (2015) in her research divides the working period into two, which are the new and old working period. Therefore, in this study,

the volunteers of SSC Malang, a non-profit organization in Malang, can be divided into two which are the newcomers and long-time members.

This research analyzes the influence of organizational culture on organizational commitment which is mediated by job satisfaction and moderated by volunteering tenure:
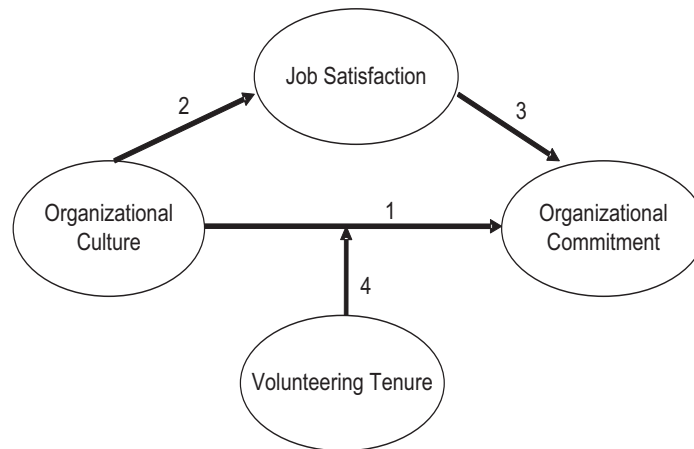

Figure 1. Research Framework

Referring to the review of related literature above, there are five research hypotheses which can be mentioned as follows:

H1: Organizational culture influences organizational commitment

H2: Organizational culture influences volunteer's job satisfaction

H3: Job satisfaction influences volunteer's organizational commitment

H4: Job satisfaction mediates the influence of organizational culture on volunteer's organizational commitment.

H5: Volunteering tenure moderates the influence of organizational culture on volunteer's organizational commitment.

3. Research Methods

This research involved the entire population members, which were 63 volunteers of non-profit organization, SSC Malang as the research respondents. Sampling technique used was census method. Data gathering was done by distributing questionnaire and documentation. The respondents' answers were measured by using 5 Likert scales. The data were analyzed by using statistic technique PLS (Partial Least Square).

Table 1. Variable Measurement

No.	Variable	Indicator
1.	Organizational Culture (Cartwright, 1999)	Equity
		Equality
		Communication
		Empathy
		Technology
2.	Job satisfaction (Locke,1970)	The work itself
		Appreciation
		Development opportunities
		Supervision
		Co-workers
3.	Organizational Commitment (Meyer snf Allen,1991)	Affective
		Continuant
		Normative
4.	Volunteering Tenure (Noermijati, 2015)	Volunteering tenure

Respondents' characteristic included gender, age, education and occupation. The numbers of female respondents were bigger than males, which is 65% female and 35% male. Majority (81%) of the respondents are between 20-30 years old and 19% is below 20 years old. Respondents with Bachelor Degree (S1) have the majority percentage 52%, S2 1% and Junior High School 41%. Based on the volunteering tenure, the majority of SSC Malang volunteers has joined the organization for more than 12 months (63%), and the rest has joined less than 12 months.

4. Data Analysis and Findings

4.1 Outer Model Evaluation

Based on the testing result of convergent validity, it shows that all research indicators are valid in measuring its own research variable.

Table 2. Testing of Discriminant Validity using Cross Loading

Item	Organizational Culture	Job satisfaction	Organizational Commitment	Volunteering Tenure
A.2.3	0.756	-0.058	0.007	0.239
A.3.1	0.618	0.368	-0.180	-0.087
A.3.2	0.617	0.023	-0.237	-0.147
A.3.3	0.692	-0.318	0.05	0.106
A.4.1	0.740	-0.109	0.075	-0.218
A.4.2	0.737	0.129	0.089	0.038
A.4.3	0.675	0.004	0.034	0.129
A.1.2	0.528	-0.166	0.148	0.136
A.2.1	0.653	0.488	-0.099	-0.079
A.2.2	0.645	-0.351	0.092	-0.130
C.1.1	0.024	0.654	0.319	0.268
C.2.1	-0.090	0.773	-0.064	0.187
C.2.3	-0.376	0.72	-0.034	0.115
C.4.1	0.132	0.703	-0.083	-0.153
C.4.2	-0.247	0.608	0.055	-0.261
C.5.2	0.232	0.810	-0.117	-0.058
C.5.3	-0.169	0.662	-0.086	-0.218
C.3.1	0.209	0.537	-0.048	0.376
C.2.2	-0.180	0.657	-0.127	-0.107
C.4.3	0.215	0.530	0.106	0.106
C.5.1	0.342	0.581	0.164	-0.229
E.1.2	-0.182	0.036	0.650	-0.062
E.1.3	0.005	0.026	0.712	0.168
E.2.3	-0.063	0.229	0.810	0.115
E.3.3	-0.042	0.200	0.778	0.233
E.3.1	0.229	-0.689	0.531	-0.130
E.1.1	-0.057	-0.056	0.536	-0.180
E.2.1	0.106	-0.176	0.539	-0.455
E.2.2	0.139	-0.277	0.521	0.008
E.3.2	-0.043	0.462	0.543	0.098
LR	0	0	0	1.000

Based on the testing result of *discriminant validity* using cross loading on Table 2, it indicates that the indicators predict its own latent variable better than other latent variable indicator. Based on the analysis result, it can be interpreted that the testing of *discriminant validity* has been fulfilled.

Based on the testing result of *composite reliability,* the composite reliability score of each research variable is: 1) organizational culture 0.889; 2) job satisfaction 0.895; 3) organizational commitment 0.854; 4) volunteering tenure 1.000. The testing result of Composite Reliability shows that the score of organizational culture, job satisfaction, commitment and volunteering tenure variable is bigger than 0.70, thus the model has fulfilled the criteria of discriminant validity (all construction on organizational culture, job satisfaction, commitment and volunteering tenure indicator strengthen each of its latent variable or able to measure its latent variable).

4.2 Inner Model Evaluation

Based on the Testing of inner was found that job satisfaction has influence with prediction score of the entire model 0.512 or 51.2%. Commitment variable has influence with prediction score 0.215 or 21.5%. Moreover, the testing on inner model can also be seen from the evaluation of predictive relevance stone-geiser Q-square test for predictive relevance. R-square score is put into Q-square equation as follows:

$$Q^2 = 1 - (1-R_1^2)(1-R_2^2)\ldots(1-Rp^2)$$

Based on Q-square evaluation, it shows that the model has predictive relevance because it has the value of 0.61692 which is bigger that 0 (zero), therefore the model is good to be used.

4.3 Hypothesis Testing

The hypothesis testing result by using PLS and Sobel formula can be seen on Table 3-5

Table 3. Direct Testing of Path Coefficient

Variable	Path Coefficient	Deviation Standard	P Values	Remarks
Organizational culture -> organizational commitment	0.165	0.119	0.086	Insignificant
Organizational culture -> job satisfaction	0.711	0.099	<0.001	Significant
job satisfaction -> organizational commitment	0.458	0.108	<0.001	Significant

Table 4. Indirect Effect of Coefficient Path, and Moderation Role

Variable	Path Coefficient	Deviation Standard	P Values	Remarks
Organizational culture→ job satisfaction → Organizational Commitment	0.343	0.079	<0.001	Significant
Volunteering tenure * Organizational culture → Organizational commitment	-0.027	0.125	0.414	Insignificant

Table 5. Moderation Testing without Involving Mediation Variable

Variable	Path Coefficient	Deviation Standard	P Values	Remarks
Organizational culture→ Organizational Commitment	0.405	0.110	<0.001	Significant
Volunteering tenure * Organizational culture → Organizational commitment	-0.017	0.125	0.446	Insignificant

Hypothesis testing is conducted to find out the influence among variables. If p-value is less than 0.05 then it is significant and thus research hypothesis is accepted, and vice versa. If p-value is more than 0.05 then it is insignificant and thus research hypothesis is rejected.

H1: Organizational culture influences organizational commitment

The testing result on Table 4 shows p-value score of direct effect of organizational culture on organizational commitment 0.09, which is above 0.05 (insignificant), thus H1 is rejected and interpreted that organizational culture does not influence organizational commitment.

H2: Organizational culture influences volunteer's job satisfaction

With 99% assurance, testing result on Table 4 shows that organizational culture has the significant positive influence on job satisfaction ($\beta = 0.71$, $P < 0.01$) which is shown by significant score <0.01. Therefore H2 is accepted.

H3: Job satisfaction influences volunteer's organizational commitment

With 99% assurance, testing result on Table 4 shows that job satisfaction has significant positive influence on commitment ($\beta=0.458$, $P<0.01$) which is shown by the significant score <0.01. Thus H3 is accepted and interpreted that the higher volunteer's job satisfaction level, it will significantly influence on the increasing of organizational commitment.

H4: Job satisfaction mediates the influence of organizational culture on volunteer's organizational commitment.

Referring to Table 4 and Table 5 which show that organizational culture does not significantly influence organizational commitment, while the organizational culture influences job satisfaction, and job satisfaction significantly influences organizational commitment, moreover the test result of the indirect effect of the organizational culture on the organizational commitment through job satisfaction is not significant, thus it can be concluded that job satisfaction fully mediates the influence of organizational culture on organizational commitment. It shows that the organizational culture will only influence organizational commitment through volunteer's job satisfaction.

H5: Volunteering tenure moderates the influence of organizational culture on volunteer's organizational commitment.

The hypothesis test result shows that the moderation role of volunteering tenure on the influence of organizational culture on organizational commitment, involving mediation variable (P-Value=0.41) and not involving (P-Value=0.44), the result shows that P-Value score >0.05 (insignificant), therefore H5 is rejected. It means that volunteering tenure does not moderate or neither strengthen nor weaken the influence of organizational culture on the organizational commitment.

5. Discussions

5.1 Organizational Culture Influences Organizational Commitment

Organizational culture does not influence organizational commitment. Descriptive analysis result shows that

volunteers perceive a strong organizational culture in SSC organization. Volunteers have high commitment; commitment indicator with highest perceived score is affective commitment indicator with quite high average score, while the lowest commitment indicator is continuant commitment indicator. It means that the volunteers of SSC Malang feel comfort and want to be a part of the organization, which is shown by the high score of affective and continuant commitment. This shows that the volunteers of SSC Malang have a strong will to stay in the organizational, no intention to leave and also have a strong organizational commitment. Organizational culture does not significantly influence organizational commitment; this can be caused by the condition when the volunteers are graduated, they are expected to expand their career in other city or place. Since most of the volunteers are university students, thus after they completed their study and work at another city, then they have to leave Malang and also their role as volunteers at SSC. This research result does not support the researches of McKinnon et al. (2003); Al-Amin and Noermijati (2010) which states that organizational culture influences the organizational commitment.

5.2 Organizational Culture Influences Job Satisfaction

Organizational culture is a profound value of an organization which is manifested into how employees are expected to behave. Organizational culture which emphasizes on the value of companionship, mentor and respect of each other will be able to increase the job satisfaction of volunteers. Organizational culture which is measured by 15 items shows that, according to the respondents' perception, the organizational culture of SSC is already in a solid level. It means that the volunteers have felt the strong organizational culture in SSC. The organizational culture indicator which is perceived with the highest average score is technology indicator, while empathy indicator gains the lowest average score even though it is still at the average-high level. Technology does not only play a very important role in the transmission of information and decision making, but also as a medium to spread and internalize the organizational culture of SSC, especially for the newly joined volunteers. What needs attention is the empathy of volunteers. It still needs to be improved in order to enhance understanding and concern between volunteers in order for them to be more satisfied. This research result is in line with the researches of Lund (2003); Bellou (2010); Dirani (2009); MacIntosh & Doherty (2010); Dinar et al (2017), which states that organizational culture influences the job satisfaction of employees.

5.3 Job Satisfaction Mediates the Influence of Organizational Culture on Organizational Commitment

Organizational culture does not have significant direct influence on organizational commitment. However, organizational culture will only influence organizational commitment through job satisfaction. Therefore, it can be concluded that job satisfaction fully mediates the influence of organizational culture on organizational commitment, and that organizational culture will only influence organizational commitment when the volunteers reach job satisfaction. Here, the role of the volunteer's satisfaction is very important so that the strong organizational culture of SSC will be able to keep the volunteers as members of SSC organizational Malang.

5.4 Volunteering Tenure Moderates the Influence of Organizational Culture on Organizational Commitment

Volunteering tenure eventually does not strengthen or weaken the influence of organization culture on organizational commitment. Whether it is new or old volunteer, it will not strengthen or weaken the influence of organizational culture on organizational commitment. Even when it is analyzed by involving and not involving job satisfaction as the mediating variable of the influence of organizational culture on organizational commitment, volunteering tenure still does not strengthen or weaken the influence of organizational culture on organizational commitment. It is related to the psychological condition of the volunteers itself, whether they are new or old volunteers, everything starts from the individual call or will of the volunteers to help other people who need their help. They become volunteers in SSC organization because they want to be beneficial for other people

6. Conclusions

6.1 Theoretical and Practical Implications

This study provides significant theoretical and managerial implications through testing associations and attempting to deliver a framework for organizational commitment of volunteers in nonprofit organization and its theoretically related job satisfaction. In this regard, it presents empirical evidence that organizational culture have positive effect on job satisfaction, but not significantly related to commitment. However, organizational commitment is indirectly affected by organizational culture through job satisfaction. Furthermore, volunteering tenure is not a moderating variable on the relationships of organizational culture - commitment and job satisfaction - commitment. Results of this study are contradictory to McKinnon et al. (2003); Zain et al. (2009); Al-Amin and Noerjimati (2010) study on the relationship of culture and organizational commitment, therefore,

further research could explore the effect of culture, along with job satisfaction as mediator on organizational commitment. The study is useful for understanding organizational culture, job satisfaction, and organizational commitment in non-profit organizations.

At a policy level, the results of the study indicate that organizational culture can benefit from instituting policies and practices aimed at fostering job satisfaction. For example, policies aimed at providing the effective communication through formal and non-formal meetings between members of the organization, provide a sense of equity and equality for all volunteers, enhance empathy, and encourage the use of technology. Organizational commitment can be enhanced through job satisfaction. For example, policies aimed at improving job satisfaction by ensuring that members of the organization have a strong motive to work as volunteers. In addition, members of the organization need to be appreciated through personal development and training policies.

6.2 Limitation of the Study

The questionnaire of this research has not added open question items. It is suggested for the further research to add open question items in order to gain more detail information related to the observed variable. It is better for the further research to broaden the research object on other non-profit organizations. It is also suggested that the next research adds other variables such as involvement and organizational citizenship behavior into research model.

6.3 Conclusions

Organizational culture does not have direct influence on volunteer's organizational commitment. A strong organizational culture has not yet been able to directly increase volunteer's commitment toward SSC organization Malang. Organizational culture influences the job satisfaction of volunteers, a strong organizational culture is able to increase the job satisfaction of the volunteers. Job satisfaction influences the organizational commitment of volunteers. Satisfied volunteers will be able to enhance their commitment toward organization. Job satisfaction fully mediates the influence of organizational culture on volunteer's organizational commitment. Organizational culture will be able to increase volunteer's commitment when it is able to enhance volunteer's job satisfaction. The volunteering tenure does not moderate or is not able to weaken or strengthen the influence of organizational culture toward the volunteer's organizational commitment.

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Relationships between Interpersonal Trust and Knowledge Sharing in Workplace: The Mediational Role of Prosocial Motives

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Abstract

This study is different from the usual cases that testing the intuitive factor as rewarding that affects the employees' knowledge sharing. In this study, the focus shifts to concentrating on the emotional factors such as interpersonal trust and the prosocial motives. Empirical methods are used to test the hypotheses, and the results show that interpersonal trust affects employees' knowledge sharing significantly. Moreover, the prosocial motives have been evidenced that it moderately mediates the relationship between interpersonal trust and knowledge sharing. This study has well evidenced all the hypotheses and gives suggestions for the future research at the end.

Keywords: knowledge sharing, interpersonal trust, prosocial motives, empirical method

1. Introduction

Knowledge's role as a competitive advantage for corporations' competition has been emphasised (Nonaka and Takeuchi, 1995), and knowledge is broadly recognised as an essential for operating firms successfully in the modern era (Holste & Fields, 2010). Knowledge sharing is a driving power that urges the knowledge-creating process and directs the intellectual capital performance at a high standard (Liebowitz 2001; Lin, 2008). Fagerberg, Mowery & Nelson (2005) point out that organisations expect to fortify organisational knowledge assets via transferring employees' knowledge to collective organisational knowledge. For example, some organisations have made huge investments to develop knowledge management systems to encourage the knowledge transfer process, and many corporations develop awarding systems to motivate the individual's sharing aspiration to their co-workers (Connelly & Zweig, 2015). However, some knowledge is embedded in individuals' brain, and it is acquired from the long-term learning. Haas and Hansen (2007) believe that some knowledge such as personal experience and sharing its progress may need to request their intention. In reality, organisations have been faced with the situation that many of the organisational members have not desired to exchange their knowledge with peers (Denning, 2006; Casimir, Lee & Loon, 2012). The previous academic contributions reveal the knowledge hiding or withholding phenomenon of employees (Connelly et al., 2012). Accordingly, this study explores the factor that can facilitate employees' intentions of sharing their knowledge, and explain how it can impact individuals' knowledge sharing.

2. Review and Hypothesis

Interpersonal trust: The empirical results from the previous academic contribution reveal the knowledge hiding or withholding phenomenon of employees (Connelly et al., 2012), and social scientists believe that trust acts as the catalyst for organisational members' cooperation (Dirks, 1999).

In organisational studies, unlike the institutional trust focusing on the relations between employees and organisations (Anderson & Schalk, 2010), interpersonal trust as the name implies is based on the trust among individuals (Zaheer, McEvily & Perrone, 1998). As knowledge sharing is generally recognised as an interaction of the human beings, from previous studies, numbers of scholars support the view that interpersonal trust plays an essential role for intra-organizational knowledge sharing (Hsu & Chang, 2014).

Mooradian, Renzl & Matzler(2006) illustrate that interpersonal trust is an expectation of peers' performance that is based on experience (accumulated by observation or interacting process). Previous research shows that organisational members' interpersonal trust has positive relations with their willingness to share knowledge in

organisations (Weir & Hutchings, 2005). From the above description, this study summarises that interpersonal trust has been evidenced by previous research that has positive relations with organisational members' intention to share their knowledge. Accordingly, this study proposes the first Hypothesis as follows: H1: Interpersonal trust is positively related to knowledge sharing in the workplace.

Prosocial Motives: The prosocial motive is a concept that is frequently used in psychology, and it is increasingly studied on Organizational citizenship behaviour (OCB) by modern scholars (Rioux & Penner, 2001; Wah, Menkhoff & Evers, 2007). Much literature agrees that the OCB is a positive performance in the workplace (Bolino et al., 2015; Organ, Podsakoff & MacKenzie, 2006), and OCB is an employees' behaviour that has the contribution to maintain the context for tasks (Organ, 1997; Takeuchi, Bolino & Lin, 2015).

Employees have done more than their duty to help peers voluntarily, take additional responsibility, etc. (Bateman & Organ, 1983; Bolino et al, 2015; Whiting, Podsakoff & Pierce, 2008), and OCB is hard to be enforced by others as it is already beyond formal performance requirements (Al-Zu'bi, 2011).

According to the definition by Rioux and Penner (2001), prosocial motives is one of the three motives that are obligated to OCB, and it shows the organisational members' purpose to help and maintain a positive relationship with others (Takeuchi, Bolino & Lin, 2015).

Unlike the desiring of rewarding for knowledge sharing, people who based on the consideration of personal compatibility may share their knowledge to help others voluntarily for the sociability (Wah et al. 2005; Lin, 2008). In this case, individuals may contribute knowledge to assist others due to this compatibility (Wah, Menkhoff, Loh & Evers, 2007). Accordingly, this study proposes the second Hypothesis as follows: H2: Prosocial motives are positively related to knowledge sharing in the workplace.

Interpersonal trust and Prosocial Motives: Different from the individualistic motive that expects to maximise individual's interests, the prosocial motive desires to maximise personal outcomes and considering others' benefits as well (De Dreu, Weingart, & Kwon, 2000; Giebels, de Dreu & van de Vliert, 2003). Giebels, de Dreu & van de Vliert(2003) summarise that people with prosocial motives tend to optionally cooperate comparing with egoistic motive, while they would reject cooperation if their partners repetitiously collapse the win-win agreements. Likewise, in the interpersonal relationship, generosity and trust are the preconditions to maintain cooperation (Gardner& West, 2004; Yost-Dubrow, R., & Dunham, 2018).

Scholars believe that individuals are more willing to help others whom they have a close personal relationship with (Nonaka & Takeuchi, 1995; Holste & Fields, 2010), previous studies also show that trust has strong relations with OCB (Singh & Srivastava, 2009). In human negotiation, high interpersonal trust contributes to facilitating participants' problem-solving prosocially (Giebels, de Dreu & van de Vliert, 2003). Accordingly, this study proposes the H3: Interpersonal trust is positively related to prosocial motives.

According to the above description, if assuming that interpersonal trust is positively related to both prosocial motives and knowledge sharing, prosocial motives are also positively associated with knowledge sharing. Depending on the logical relationship, this study proposes the H4: Prosocial motives mediate the relationship between interpersonal trust and knowledge sharing.

3. Methodology

Design and Respondents: Quantitative research methods are employed in this research, and a questionnaire is utilised as the tool for data collection. Before distributing to the respondents, we have double-checked and proofread the expression of the questions. After receiving a small scale of people's evaluation of the draft questionnaire, we modified the questions to be more pellucid.

Nearly 300 people from different corporations in China were informed, and they were requested to answer the questionnaire (the participants were selected from our formal co-workers, and graduated school followers).

129 respondents assisted the data collection progress. From the descriptive analysis, 58.91% of the respondents are female, and 41.09% of respondents are male. 65.12% of the respondents' ages are concentrated from 26 to 40 years old, followed by the youth from 18 to 25 years of age with the percentage of 27.13%. From the data set, the position of the respondents is ordinary workers, mid-level managers, and top managers with nearly the percentage of 55.81%, 34.88%, and 9.30% respectively. Most respondents have accepted higher education with 40.31% acquired a bachelor's degree, and 52.71% obtained a master's degree.

In Appendix 1, the detail questions of the questionnaire have been illustrated. This study selects the questions from the prior research to measure interpersonal trust (Independent variable). Zaheer, McEvily & Perrone (1998) have adopted a scale by Rempel & Holmes (1986) to measure interpersonal trust, and after modification, the

scale performs well with 0.8799 of Cranach's alpha that largely surpasses the minimum standard with 0.600 of Cranach's alpha (Liao, Fei & Chen, 2007). Hence, we have adapted this 5-item scale for the second time and include detailed descriptions to ensure the expression is clear and pellucid. Likewise, this study is based on the contribution of Chow & Chan (2008) and summarises four questions to measure the knowledge sharing (Dependent variable) from the viewpoint of people's intention of knowledge sharing. Further, this study adopts the approach of Grant & Mayer (2009) to measure the prosocial motive (Mediating Variable) in OCB. A 4-item scale has been used for measurement of prosocial motives.

Reliability and Validity: This research adopts Likert seven scales for the variable measuring: from '1' to '7', which equals the agreement level from 'totally disagree' to 'totally agree'. Further, this research adopts 13 items of the objective questions that are prepared to analyse the reliability of the questionnaire; Cranach's alpha value of the total 13 items is 0.902.

Statistical details of the items are shown as below in Table 1. For quantitative research methods, from experience, if the value of Cranach's Alpha surpasses 0.600 that means the performance of the questionnaire is beyond the ordinary researching level (Liao, Fei & Chen, 2007).

From Table 1, the minimum value of Cranach's alpha is 0.808 that is much higher than 0.600. Hence, the questionnaire's reliability is acceptable for further analysis. In this paper, Kaiser-Meyer-Olkin and Bartlett's test is utilised to test whether the data is suitable for factor analysis. The result of KMO value is 0.887 in this research, and 'Bartlett's Test of Sphericity' witnesses significance (p<0.001).

Table 1. Testing results of Reliability

Item	Question N	Cranach's Alpha
Interpersonal trust	5	.808
Prosocial motives	4	.899
Knowledge sharing	4	.929

Ismail et al. (2010) summarise that, for most of the cases, KMO value is requested no less than 0.600, and 'Bartlett's Test of Sphericity' requires witnessing significance. Hence, the above results mean that the data sets are suitable for factor analysis, and this study uses Exploratory Factor Analysis (EFA) to test the validity.

This study uses the Principal Component Analysis to measure the items: Interpersonal trust, prosocial motives, and Knowledge sharing. In table 2, the results show that there are three components, and the loading value that surpasses 0.5 has been displayed.

Accordingly, this study summarises as follows: The factor load of all the items used for measuring knowledge sharing is satisfactory; the factor load of all the items used for measuring prosocial motives is satisfactory; Four-fifth of the items' factor load that is used for measuring interpersonal trust is satisfactory. After testing the validity of this questionnaire, this study starts the following analysing. According to the methods by Casimir, & Loon (2012), this study uses the mean value of the satisfactory items of each component that has been used to scores the three variables as independent, dependent and mediating variables.

From Table 3, the correlations between independent, dependent and mediating variables perform significantly. The results show that interpersonal trust has positive correlations with both knowledge sharing (r= .586; p<0.01) and prosocial motives (r= .265; p<0.01). Additionally, the prosocial motive is significantly related to knowledge sharing (r= .517; p<0.01).

Table 2. Rotated Component Matrix

Items	Component		
	1	2	3
KS4	.866		
KS3	.862		
KS2	.855		
KS1	.739		
PM2		.914	
PM1		.858	
PM4		.827	
PM3		.761	
IT4			.810
IT5			.739
IT3			.725
IT2			.649

Extraction Method: Principal Component Analysis

Rotation method: Varimax with Kaiser Normalization

a.   Rotation converged in 5 iterations. KS=Knowledge sharing; PM=Prosocial motives; IT=Interpersonal Trust.

Table 3. Descriptive analysis and Correlations

Variables	Mean	S. D.	1	2	3	4
1.Individual status	1.53	.662				
2.Workers' educational level	2.48	.626	-.060			
3. Interpersonal trust	4.90	1.057	.120	-.204*		
4.Prosocial Movies	5.63	1.029	.273**	-.058	.265**	
5.Knowledge sharing	5.48	1.130	.311**	-.190*	.586**	.517**
Valid N=129						

Notes. Gender: '1'= 'male ';'2'='female '

Individual's educational level: '1'=Bachelor',' 2=Master '3= 'Doctor.'

Individual's status: '1'='Ordinary'; '2'= 'medium '; '3'='senior manager'

**. $P < 0.01$ (2-tailed). *. $P < 0.05$(2-tailed)

4. Hypothesis Testing

From the information in Table 4, Model 1(R^2=. 344, p<0.001) shows that interpersonal trust has a significant effect on knowledge sharing with β=. 594, p<0.001. Hence, these results support Hypothesis 1: Interpersonal trust has a positive role in knowledge sharing. This result means people have higher interpersonal trust with their peers, their aspiration on knowledge sharing would be stronger.

Further, Model 2(R^2=. 268, p<0.001) shows the positive effect of prosocial motives on knowledge sharing. The analysing results also evidence that prosocial motives have a significant impact on knowledge sharing with β=. 568, p<0.001. Hence, this result supports Hypothesis 2 successfully and illustrates that stronger prosocial motives would promote organisational members' knowledge sharing. Model 4(R^2=. 070,p<0.01), and additionally, illustrates the relations between interpersonal trust and prosocial motives, and the analysing results show that interpersonal trust has significant effects on prosocial motives of β=. 244,p<0.01. Hence, this result fully supported the Hypothesis 3. This result symbolises that Organisations can promote people's prosocial motives via strengthening the interpersonal trust among peers.

Accordingly, the above descriptions illustrate the correlation of interpersonal trust, prosocial motives, and knowledge sharing. The followings would be the test of prosocial motives' mediating role in the relationship between interpersonal trust and knowledge sharing.

This research adopts the classical approaches by Baron & Kenny (1986) to examine the mediating effects, and the conditions are summarised as below: 1. Independent variables need to affect dependent variables significantly; 2. Independent variables need to affect the mediator significantly; 3. Mediate variable needs to affect a dependent variable significantly; 4. Whether the independent variable's significance changes when including mediating variable into the original model that examines the relationship between the independent variable and dependent variable.

Table 4. Regression analysis

Variables		Knowledge Sharing		Prosocial motives	
		Model 1	Model 2	Model 3	Model 4
Constant		2.687***	2.287***	.775	4.475***
Explanatory	Interpersonal trust	.594***		.489***	.244**
	Prosocial motive		.568***	.427***	
Model Statistic	R^2	.344	.268	.485	.070
	F	66.556***	46.437***	59.292***	9.592**

***.P<0.001; **. P <0.01; *. P <0.05;

According to the regression analysis results, the results support Hypothesis 1, and Model 1 satisfies the condition one by the independent variable's effects on the dependent variable is significant. Model 4, additionally, illustrates the relations between interpersonal trust and prosocial motives, and independent variable significantly affects the mediating variable. Model 1 evidences that prosocial motives have a significant effect on individuals' knowledge sharing, and this satisfies condition 3: Mediator has a significant effect on the dependent variable. After satisfying the above three conditions, we begin to include the mediator into the interaction model of independent and dependent variables to examine whether it satisfies the last condition to prove the existence of the mediating effect.

Model 3 (R^2=. 485, p<0.001) is created based on Model 1 (R^2=. 344, p<0.001) and includes the mediator into the model. Comparing Model 3 and Model 1, it is not tough to find that the β value of 'interpersonal trust' reduces from 0.594 to 0.489, and the significant level still witnesses significance. The examining result satisfies the experimental requirements as if the independent variable's affecting significance vanishes that means the independent variable is wholly mediated, and the other situation may show that it is partly mediating effect (Sarkis, Gonzalez-Torre & Adenso-Diaz, 2010).

Hence, analysing results show that prosocial motives partly mediate interpersonal trust's effect on knowledge sharing. Although H4 has been supported, the results show that the channels linking the interpersonal trust and knowledge sharing are not limited to prosocial motives. Therefore, other mediators may need to be explored in future studies.

5. Discussion and Conclusion

This paper has already proven the Hypothesis from 1 to 4 that are fully supported by the analysing results. This research shows that the interpersonal trust has a positive effect on employees' knowledge sharing. Accordingly, people are more willing to share with persons of higher-level interpersonal trust with them. Further, people's prosocial motives also contribute to their knowledge sharing intention. That means people's motives in helping others facilitate their knowledge sharing to be compatible. According to the research result, people's prosocial motive is also based on their interpersonal trust with their peers.

However, there are several limitations of this research which also need to be pointed out. The questionnaire has been sent by experience, and the survey is designed by self-evaluation. Hence, respondents' higher evaluation of themselves may cause the statistical deviation.

Further, interpersonal trust has been emphasised and evidenced to affect the process of knowledge sharing positively. That does not mean that only interpersonal trust has this unique effect. Hence, in future studies, more research could focus on this direction to explore the factor that can boost employees' knowledge sharing. From the research results, the relationship between interpersonal trust and knowledge sharing in the workplace has been proved to be partly mediated by prosocial motives. Hence, this result means there are not just prosocial motives that have the bridge effects.

Accordingly, in the future research, some other factors are suggested to be explored. Furthermore, empirical methods have been used. Researchers believe that a single research approach might limit the perspective (e.g. Carr, 1994; Duffy, 1987). Hence, the diversity of research methods should be suggested for the future studies.

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Appendix 1

Notes: Likert 7 scales are used: '1' to '7' equals the agreement level 'totally disagree' to 'totally agree'. Respondents are requested to answer according to their situation to score the agreement level of the description below.

Knowledge sharing (KS) adapts from Chow & Chan (2008)

KS 1: *I* am willing to share *my* work report, organisational documents with colleagues more diligently in *my* future work.

KS 2: *I* am willing to share relevant work guides, models, and methods with *my* colleagues in the future.

KS 3: *I* am willing to share *my* accumulated experience and theoretical knowledge with *my* colleagues.

KS 4: *I* am willing to share *my* knowledge gained via learning and training with *my* colleagues.

Prosocial motives (PM) adapts from Grant & Mayer (2009)

PM 1: *I* hope *my* action at work has the positive effect on others.

PM 2: *I* hope *I* can help others via *my* works.

PM 3: *I* think if *I* have the ability to help others that will make *me* more excellent at work.

PM 4: *I* think if *I* have the ability to help others that will make *my* peers have a good impression.

Interpersonal trust (IT) adapts from Zaheer, McEvily & Perrone (1998)

IT 1: *I* have been consulting the people *I* work with.

IT 2: *I* can predict accurately of the action of the people *I* contact.

IT 3: *I* think most of the people *I* interact with are trustworthy.

IT 4: *I* am sure the people *I* meet will consider *my* interests.

IT 5: *I* will feel frustrated if *I* cannot predict the behaviour of people *I* interact with well.

(The questionnaire is written in Chinese, and the above is the English translation)

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Corporate Social Responsibility in Family and Non-Family SMEs in Mexico

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Abstract

Corporate social responsibility (CSR) has been practically oriented towards large companies, and few studies have analyzed this construct in a context of family businesses, but there are few studies that relate CSR in small and medium-sized enterprises Family businesses (SMEs) and non-family businesses. Therefore, this empirical study has the essential objective of analyzing CSR in a context of family and non-family SMEs in Mexico. The results show that CSR is exactly the same in both family SMEs and non-family SMEs in Mexico.

Keywords: corporate social responsibility, family firms, SMEs

1. Introduction

The debate related to Corporate Social Responsibility (CSR) in the current literature of business and management sciences has focused mostly on big enterprises (Baumann-Pauly *et al.*, 2013), especially in multinational ones (Spence, 2007; Jamali *et al.*, 2009; Ladzani & Seeletse, 2012). However, there are relatively few theoretical and empirical investigations focused on the analysis and discussion of CSR in small and medium-sized enterprises (SMEs) (Bevan & Yung, 2015; Jamali *et al.*, 2017), especially about SMEs in developing countries (Khan & Lund-Thomsen, 2011; Amaeshi *et al.*, 2016; Jamali *et al.*, 2017). There are even less researches published in the literature that analyzes CSR in family and non-family SMEs (Déniz & Cabrera, 2005; Amman *et al.*, 2012; Campopiano & De Massis, 2014; Yu *et al.*, 2015).

Even when researchers and scholars have acknowledged the importance of family enterprises in the economy and society for both developed and developing countries, as it is the case of Mexico, (Gersick *et al.*, 1997; Neubauer & Lank, 1998; Dyer, 2003; Chua *et al.*, 2003), because according to the most recent estimates it is said that, on average, family enterprises represent around 60% of the existing enterprises in countries (Déniz & Cabrera, 2005). Despite this, the analysis and discussion about the nature and operation of family enterprises and more specifically the discussion of the existing CSR in this type of enterprises mostly in family SMEs has received little attention from researchers and scholars (Gersick *et al.*, 1997; Chua *et al.*, 1999; Déniz & Cabrera, 2005).

Similarly, it is possible to find investigations in the current literature that imply that family enterprises tend to make decisions that allows them to be more socially responsible than non-family ones (Dyer & Whetten, 2006; Berrone *et al.*, 2010). Moreover, Gómez-Mejía *et al.* (2007) concluded in their research that the control exerted by the owner of the family firm makes the rest of the family more conservative except when they take risks to improve the control of the firm. Thus, SMEs generally diminish the negative impacts of their industrial activities and make the most of their positive impacts through the improvement of social, economic and environmental problems as well as they contribute significantly to the development of the community and the society where they belong to which creates a higher level of social responsibility (Rundle-Thiele *et al.*, 2008; Lindgreen & Swaen, 2010).

Consequently, Quazi and O'Brien (2000) made an extensive review of the literature and summarized accurately the different approaches that enterprises have about CSR by creating a model that includes two basic dimensions:

the span in which the CSR activities take place and the rank of the results of this social commitment. Nonetheless, this investigation is not conclusive and it is necessary to carry out more empirical researches that provide more evidence of the CSR that SMEs have so this can be integrated to the biggest sector of organizations, that is, small family enterprises (Dyer, 2003). Additionally, it is also needed more research papers that identify and analyze the different types of behaviors that family and non-family firms have (Déniz & Cabrera, 2005), including CSR (Yu *et al.*, 2015).

Within this context, and following the suggestions of Uhlaner and Masuerl (2004), Déniz and Cabrera (2005), Campopiano and De Massis (2014), as well as Yu *et al.* (2015), the main contribution of this empirical research is the analysis and discussion of CSR in family and non-family SMEs, from a country with an emerging economy as it is the case of Mexico. Another contribution of this investigation could be the methodology used since it will apply the model of multi-group structural equations to test the projected theoretical model. The rest of the paper has been organized in the following way: the second section makes a review of the theoretical framework, the previous empirical researches and the establishment of the research hypothesis; the third section presents the methodology, the sample and the variables used; the fourth section analyzes the results obtained and, in the final section, the main conclusions and the discussion of the empirical research are presented

2. Method

The discussion and analysis of CSR as one of the main business topics has taken place since the beginning of the last century (f.e. Berle, 1931; Dodd, 1932) and now in the present its conceptualization is still a debate (Yu *et al.*, 2015) as there is not a clear consensus among researchers and scholars of a convincing definition although generally most authors consider that the definition must include the "triple bottom line" principles (people, planet and profit) (Yu *et al.*, 2015). In this context, one of the closest definitions to these three principles is the one developed by Aguinis (2011: 855), who defines CSR as a *"specific context of organizational actions and policies that take into account the expectations of suppliers and the social, economic and environmental actions"*.

Accordingly, in the literature of business and management sciences, there are several definitions of family firm, but there is not a current consensus about a definition accepted by most researchers and scholars (Amann *et al.*, 2012). However, Villalonga and Amit (2004), as well as Allouche *et al.* (2008), suggested that any definition of family enterprise must include three essential elements: *1)* one or more families will need to have most of the capital; *2)* the family members will need to have most of the control of the enterprise including the distribution of capital, most of the rights to vote in the organization as well as the legal restrictions and, 3) the members of the family will have to be in the administrative positions of the enterprise.

Despite the increase of theoretical and empirical investigations in the last decade, there are relatively few researches that have focused in the analysis of CSR in family firms (Yu *et al.*, 2012; Amman *et al.*, 2012; Yu *et al.*, 2015), and more recently the publication of this topic has increased in family firms (Déniz & Cabrera, 2005; Craig & Dibrell, 2006; Dyer, 2006; Niehm *et al.*, 2008; Huang *et al.*, 2009; Berrone *et al.*, 2010; Bingham *et al.*, 2011; Neubaum *et al.*, 2012; Amann *et al.*, 2012; Block & Wagner, 2014; Van Gils *et al.*, 2014; Yu *et al.*, 2015). It is also common to find in the literature papers that analyze family and non-family enterprises through the return of investments (Anderson & Reeb, 2003), the growth in sales (Daily & Dollinger, 1992; Gallo *et al.*, 2000; Chrisman *et al.*, 2004), the level of satisfaction in the job (Beehr *et al.*, 1997), the innovation (Tanewski *et al.*, 2003) and, more recently, CSR (Deniz & Cabrera, 2005; Dyer & Whetten, 2006).

Moreover, some previous investigations published in the current literature suggest that small family firms can tend more to the implementation of CSR activities (f.e. Uhlaner *et al.*, 2004; Déniz & Cabrera, 2005; Block & Wagner, 2010) since one of the main arguments is that family enterprises have a better understanding of the reputation of the enterprise than those who are non-family organizations (Amann *et al.*, 2012). Consequently, Block and Wagner (2010) compared the different types of owners of small enterprises and concluded that the proprietors of small family firms have a higher reputation about their social responsibility in the communities where they are located.

Furthermore, it can also be found in the literature another explanation that complements the previous one which considers that the long term orientation of these small family enterprises is better when compared with non-family firms (Amann *et al.*, 2012). This long-term orientation refers basically to the main shareholders of the family in the enterprise who have a vision of preserving the ownership of the small family firm through generational inheritance (Abdellatif *et al.*, 2010). Likewise, Le Breton-Miller and Miller (2006) concluded that the long-term orientation allows family enterprises to attain organizational characteristics that are difficult to be imitated or copied by their competitors and at the same time these characteristics allow them to develop policies

for long-term investments in order to improve their corporate image.

In a similar trend, Graafland (2002) considered that most small family enterprises have a positive between value addition in the long term and their corporate image; that is why they are more focused in the implementation of bigger CSR actions than non-family firms. Following a similar reasoning of the long term orientation Block and Wagner (2010) established that family firms that have adopted and implemented a long term orientation usually have a higher relation with their clients and suppliers when compared with non-family enterprises which can often be observed in the significant increase of social responsibility actions that small family organization carry out and, consequently, a higher level of CSR.

Within this idea of long term orientation, small family firms usually protect their employees better, they get more involved in social and philanthropic activities in their communities, they implement management policies of their integrity regarding their business reputation and they respect the family values and traditions of their employees and the community when compared with non-family firms (Donnelly, 1964; Ward, 1987; Leach, 1993; Poza, 1995; Neubauer & Lank, 1998; Miller & Le Breton-Miller, 2003). These special actions and characteristics that small family firms have is not only a source of competitive advantages but it is also the basis of resources, and specific abilities that become difficult for their main competitors to copy and imitate them (Ward, 1999; Habbershon & Williams, 1999; Cabrera *et al.*, 2001; Gnan & Montemerlo, 2002), and producing with this a higher level of CSR (Déniz & Cabrera, 2005).

Similarly, there are other published investigations in the literature that establish that small family firms have a socially responsible behavior that is higher than non-family ones (Amann *et al.*, 2012). Thus, for example, Adams *et al.* (1996) analyzed the ethical behavior of family and non-family firms but their results did not show any significant difference between them. However, theses researchers considered some arguments to differentiate the ethical behavior of family and non-family enterprises by using, for example, the long-term orientation that family firms have (f.e. Dyer, 2003; Zellweger, 2007), which produces not only a higher ethical behavior in family companies over non-family organizations (Long & Mathews, 2011), but also a higher social responsibility in their strategic decisions (Chrisman *et al.*, 2012; Kotlar & De Massis, 2013).

Moreover, the strategies adopted and implemented by family firms are usually associated to their ethical behavior (Donckels & Frohlich, 1991), which allows family companies to be more progressive than non-family organizations in terms of their human resources and in their social responsibility (Aldricht & Langton, 1998; Reid & Adams, 2001; Colombo *et al.*, 2014). Accordingly, Dyer and Whetten (2006) proved that there are no significant differences between family and non-family firms regarding the implementation of support to their employees, the society and the environment but they did find that family companies tend to be more cautious in the social actions that they develop, in the protection of their reputation and validate their social responsibility in the community where they are located when compared with non-family firms.

In this regard, small family firms have more social pressure in the implementation of business actions and activities that ensure a better conservation of the environment (social responsibility) of the area or community where they are located (Yu *et al.*, 2015) since this type of pressure is generally associated with the high level of concentration in the specialization of only one product or service or in the geographic limitation where small family companies work (Berrone *et al.*, 2010). Consequently, it is possible to find in the literature some investigations that have proved that family enterprises tend to adopt and develop innovations that are more well-intentioned with the environment than non-family companies which makes them more socially responsible and better connected with the area or community where they are located (Zellweger & Nason, 2008; Huang *et al.*, 2009).

According to this perspective, small family firms have a higher social commitment to protect and maintain the environment because such commitment does not only reinforce the affective bonds but also keep the socio-emotional richness from both the members of the family enterprise and the community in general (Gómez-Mejía *et al.*, 2007; Berrone *et al.*, 2010; Cennamo *et al.*, 2012). As a result, this perception provides small family firms with access to the different resources of the family (Sirmon & Hitt, 2003; Arregle *et al.*, 2007) facilitating with this the creation and development of a family identity, a bigger emotional capital (Sharma, 2004) and strong family values (Dyer, 2003) creating with this a higher CSR and the implementation of better environmental corporate practices (Cennamo *et al.*, 2012).

Within this perspective, Berrone *et al.* (2010) concluded that the socio-emotional richness of family firms is one of the most solid arguments that explain why families do not only have a better control of the enterprises but they are also more committed with the protection and preservation of the environment than non-family enterprises. Therefore, the socio-emotional richness creates a higher social commitment in small family firms

(Gómez-Mejía *et al.*, 2007; Berrone *et al.*, 2010) and a significant increase in the level of economic resources of the family enterprise (Gómez-Mejía *et al.*, 2007) and it is one of the essential elements that allow that the behavior of small family enterprises is completely stimulated by the achievement of economic and non-economic goals as it is the case of CSR (Kotlar *et al.*, 2013). Thus, at this point, it is possible to establish the following research hypothesis:

H₁: Family and non-family SMEs are different in their CSR practices.

2.1 Sampling Procedures

In order to answer the research hypothesis stated in this research paper, an empirical investigation was made with a sample of 400 small and medium-sized enterprises from Aguascalientes State (Mexico). For the research it was considered the 2016 business directory of the Sistema de Información Empresarial Mexicano (System of Mexican Business Information, or SIEM) for Aguascalientes State which had 5,194 registered enterprises in December 2016 but for practical purposes the only enterprises considered for this research were the ones that had from five to 250 workers which produced a business directory of 1,261 enterprises. Additionally, the sample was selected randomly with a reliability level of 96% and a sampling error of ±4.5%, which produced a total sample of 400 enterprises. The interviews were made from January to April 2016.

Similarly, the instrument used was a questionnaire, which was applied as a personal interview to managers and/or owners of the 400 selected enterprises. Moreover, from the total of questionnaires obtained, 264 (66%) were considered as family firms and 136 (34%) as non-family companies. Finally, the questionnaire obtained information regarding the characteristics of the enterprises (family and non-family SMEs) as well as the adoption and implementation of socially responsible business activities of SMEs.

2.2 Measures and Covariates

Accordingly, the scale adapted from the European Union (2001), Bloom and Gundlach (2001), Bigné *et al*. (2005) as well as Alvarado and Schlesinger (2008), was used for the measurement of business social responsibility. They considered that CSR can be measured easily through three dimensions: *social responsibility* (measured by means of a ten-item scale), environmental responsibility (measured by means of a seven-item scale), and economic responsibility (measured by means of a seven-item scale). All the items of the CSR scale are based on a Likert-type scale of five positions from "1 = completely disagree to 5 = completely agree" as limits.

Furthermore, the reliability and validity of the CSR scale was evaluated with a Multiple-group Confirmatory Factorial Analysis (MCFA), by using the method of maximum likelihood with the software EQS 6.1 (Bentler, 2005; Brown, 2006; Byrne, 2006). Furthermore, the reliability of the five scales considered in this empirical research was evaluated with two essential indices: Cronbach's alpha and the Composite Reliability Index (CRI) (Bagozzi & Yi, 1988). Additionally, the recommendations made by Chou *et al.* (1991) and by Hu *et al.* (1992), were taken into consideration regarding the correction of statistics of the theoretical model when it is considered that the normalcy of data is present as well as the robust statistics in order to provide a better statistical adjustment of the data (Satorra & Bentler, 1988).

Additionally, the adjustments indices used were the Index of Normalized Adjustment (NFIT), the Index of Not Normalized Adjustment (NNFIT), the Index of Comparative Adjustment (CFI) and the Root Mean Square of Error Approximation (RMSEA) (Bentler & Bonnet, 1980; Byrne, 1989; Bentler, 1990; Hair *et al.*, 1995; Chau, 1997; Heck, 1998). If the NFIT, NNFIT and CFI values are between 0.80 and 0.89 then it can be said that there is a reasonable adjustment of the theoretical model (Segars & Grover, 1993). Conversely, if the average of these three indices is equal or higher than 0.90 then it is an evidence of an excellent adjustment of the theoretical model (Jöreskog & Sörbom, 1986; Byrne, 1989; Papke-Shields et al., 2002). If the RMSEA value is lower than 0.080, it is considered as acceptable (Jöreskog & Sörbom, 1986, Hair *et al.*, 1995).

Table 1. Internal consistency and convergent validity of the theoretical model

Variable	Indicator	Factorial Loading	Robust t-Value	Cronbach's Alpha	CRI	IVE
Family SMEs						
Social Responsibility	RSS2	0.642***	1.000[a]	0.913	0.914	0.606
	RSS5	0.688***	9.235			
	RSS6	0.740***	10.546			
	RSS7	0.810***	11.120			
	RSS8	0.867***	11.555			
	RSS9	0.883***	11.640			
	RSS10	0.788***	11.003			
Environmental Responsibility	RSA1	0.918***	1.000[a]	0.915	0.916	0.636
	RSA3	0.718***	14.577			
	RSA4	0.750***	15.337			
	RSA5	0.792***	16.192			
	RSA6	0.847***	17.398			
	RSA7	0.785***	15.762			
Economic Responsibility	RSE2	0.648***	1.000[a]	0.859	0.860	0.555
	RSE4	0.654***	9.300			
	RSE5	0.810***	10.464			
	RSE6	0.809***	10.339			
	RSE7	0.788***	9.682			
Non-Family SMEs						
Social Responsibility	RSS2	0.642***	1.000[a]	0.902	0.903	0.575
	RSS5	0.681***	9.235			
	RSS6	0.691***	10.546			
	RSS7	0.777***	11.120			
	RSS8	0.857***	11.555			
	RSS9	0.866***	11.640			
	RSS10	0.763***	11.003			
Environmental Responsibility	RSA1	0.809***	1.000[a]	0.908	0.909	0.625
	RSA3	0.735***	14.577			
	RSA4	0.777***	15.537			
	RSA5	0.803***	16.192			
	RSA6	0.854***	17.398			
	RSA7	0.761***	15.762			
Economic Responsibility	RSE2	0.615***	1.000[a]	0.862	0.863	0.562
	RSE4	0.628***	9.300			
	RSE5	0.831***	10.464			
	RSE6	0.854***	10.739			
	RSE7	0.786***	15.762			

$S\text{-}BX^2$ (df = 276) = 426.525; p < 0.000; NFI = 0.882; NNFI = 0.899; CFI = 0.929; RMSEA = 0.052

[a] = Parameters limited to that value in the identification process

*** = p < 0.01

The results of the MCFA are presented in Table 1 and they suggest that the theoretical model of business social responsibility has a good adjustment ($S\text{-}BX^2$ = 426.525; *df* = 276; *p* = 0.000; *NFI* = 0.882; *NNFI* = 0.899; *CFI* = 0.929; *RMSEA* = 0.052). All the items of the related factors are significant (p < 0.001), the size of all the standardized factorial loads are higher than 0.60 as recommended by Bagozzi and Yi, 1988; Cronbach's alpha and the CRI have a value higher than 0.70 and the variance extracted index (VEI) has a value higher than 0.50 (Fornell & Larcker, 1981). These values indicate that there is enough evidence of reliability and convergent validity, which justifies the internal reliability of the CSR scale used (Nunally & Bernstein, 1994; Hair *et al.*, 1995).

Likewise, a reliability interval test was carried out in order to evaluate the discriminant validity of the CSR model, for both family and non-family firms proposed by Anderson and Gerbing (1988). It establishes that with an interval of 95% of reliability none of the individual latent elements of the matrix of correlation must have a value of 1.0 for both family and non-family SMEs. Therefore, based on the results obtained (with the same results for family and non-family firms) from this test, it can be concluded that that both measurements provide enough evidence of discriminant validity of the theoretical model. These results can be observed in detail in Table 2.

Table 2. Discriminant validity of the theoretical model

Variables	Social Responsibility	Environmental Responsibility	Economic Responsibility
Social Responsibility		0.256 – 0.427	0.293 – 0.385
Environmental Responsibility	0.256 – 0.427		0.268 – 0.404
Economic Responsibility	0.293 – 0.385	0.268 – 0.404	

Above the diagonal the estimated correlation of factors is presented with 95% confidence interval of the Family SMEs. Below diagonal, the estimated correlation of factors is presented with 95% confidence interval of the Non-Family SMEs.

3. Results

In order to prove the hypothesis presented in this empirical research, a structural equations model (SEM) with software EQS 6.1 was applied (Bentler, 2005; Byrne, 2006; Brown, 2006). In it, the nomological validity of the theoretical model of CSR was examined through the Chi-square test, which compared the results obtained between the theoretical model of CSR and the measurement model of CSR. Such results indicate that the differences between both models are not significant which can offer an explanation of the relationships observed among the latent constructs (Anderson & Gerbing, 1988; Hatcher, 1994). Figures 1 and 2 show a path analysis of these results for both family and non-family SMEs.

*** = p < 0.01
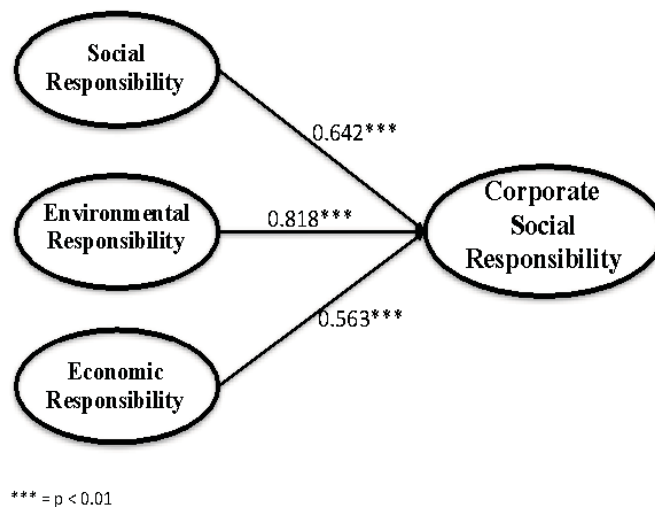
Figure 1. Results of the structural equation model of Family SMEs

*** = p < 0.01
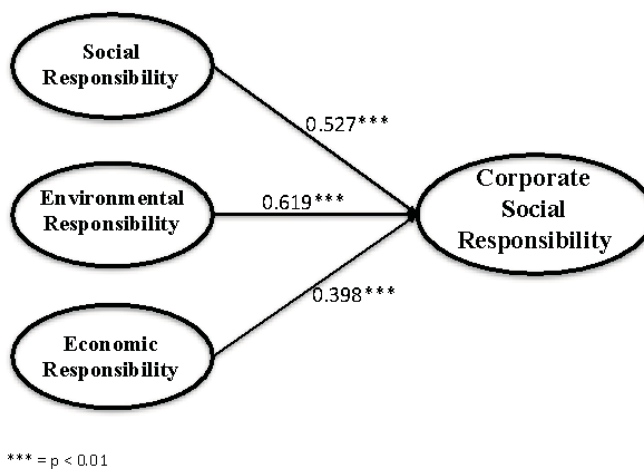
Figure 2. Results of the structural equation model of Non-Family SMEs

As it can be seen in Figures 1 and 2, small family firms have better results in the implementation of CSR activities (0.642; 0.818; 0.563), than small non-family firms (0.527; 0.619; 0.398), which can validate the hypothesis established about the existence of differences in CSR activities between family and non-family

enterprises. Accordingly, both family and non-family firms develop more activities of environmental responsibility followed by social and economic responsibility but then again family organizations have better results. Thus, it is possible to conclude that the results obtained show that small family firms have better results of the adoption and implementation of CSR activities than small non-family firms and that the environmental responsibility is the most developed activity in both types of enterprise.

4. Discussion

The results obtained in this empirical research can conclude three main aspects. Firstly, the adoption and implementation of social activities carried out by family SMEs in communities or regions where they are located produce a higher level of social responsibility when compared with non-family SMEs. For this reason, the philanthropic activities carried out for family and non-family firms have a positive impact in the organization's image as a whole although non-family SMEs have a lower level of impact in their CSR. This can make that consumers and clients of products and services prefer the acquisition of the products or services from family SMEs instead of the ones from their main competitors.

Secondly, it is also possible to conclude that SMEs which carry out social activities regarding the protection of the environment have a bigger CSR impact than the activities implemented by non-family SMEs but the society of the communities or areas where they are located both family and non-family firms perceive that this type of enterprises promote significantly the protection of the environment of their community or are. Consequently, the development of the activities carried out by both family and non-family SMEs that promote the protection of the environment usually produce an acknowledgement not only as socially responsible SMEs but also as enterprises with a higher degree of acceptation of their products or services from consumers and clients both current and potential.

Finally, it is also possible to state that the economic activities implemented for both family and non-family SMEs have a smaller impact in CSR even when the results show that family SMEs carry out better economic support activities for their workers and the area or community where they are located this type of enterprise. Thus, the actions of economic support and improvement of the quality of life for the workers of both family and non-family SMEs and the society as a whole are appreciated by the people of the community or area although with a different emphasis from the social and environmental actions but this also gives them a higher level of social responsibility to family SMEs and a lower level to non-family SMEs

Similarly, the results obtained and the conclusions achieved also have different implications for both executives as well as family and non-family SMEs. Thus, a first implication could be that family firms usually have social values which are very similar to the ones of the society in the communities or areas where they are located since most workers and employees come from these places and even the very same family that owns the enterprise live in the same community or area which makes them known and respected families by the society as a whole. This creates a higher acknowledgement as enterprises that are socially responsible. Nonetheless, this does not happen with non-family SMEs which settle in industrial parks and they do not have values, similar organizations to the society in the communities or areas where they are located, not even the executives have ties with the society.

A second implication may be that the owners of family SMEs usually support economically to the development of social activities that highlight and promote religious and/or civic traditions of the communities or areas where they are located. This allows them not only to be recognized as an essential part for the growth and economic and social development of the area or community but also as socially responsible enterprises. The opposite thing happens to non-family SMEs, since generally the social traditions of the area or community where they are located are not part of their organizational culture and they do not sponsor their development. This avoids them from getting a similar rank of family SMEs, that is, they are not considered as socially responsible.

A third implication could be that family SMEs also usually have a good social reputation, not only for the production of products or services required by society, since generally this type of enterprises have a local or regional market, but they also contribute regularly with economic resources for the support and preservation of the environment of the community or area where they are located which allows them to be considered as socially responsible enterprises. On the other hand, non-family SMEs normally do not get involved in activities for the care and preservation of the environment of the area or community where they are located, they do not even provide economic elements for the preservation of natural resources which could be one of the main reasons to not consider them as socially responsible at the same level of family SMEs.

Finally, a fourth implication could be that family SMEs usually carry out philanthropic activities to benefit the society of the communities or areas where they are located since the values of the society are an essential part of the values and the culture of the very family organization. When they settle down, normally next to hospitals,

schools and churches, these institutions ask for in-kind contributions or economic support for the development of their activities, which creates a big acknowledgement as enterprises that are socially responsible. However, non-family SMEs do not normally do this type of philanthropic contributions or get involved in the social activities of the community or area where they are located. This could be one of the main reasons that the members of a society do not consider them as socially responsible enterprises and they do not have a similar image to those that are family SMEs.

Additionally, this empirical research also has different limitations that are necessary to present. The first one is related to the use of the scale for the measurement corporate social responsibility of family and non-family SMEs since only three factors or dimensions were considered: social, economic and environmental responsibility. Future investigations will need to consider other factors or dimension in order to prove the results obtained. A second limitation could be the collection of information since the only variables considered for the measurement of corporate social responsibility of family and non-family SMEs were qualitative variables. Further researches will have to consider the incorporation of quantitative or hard data variables in order to check if the results obtained are the same as the ones of this research paper.

A third limitation could be the instrument to collect information that was applied only to managers and/or owners of family and non-family SMEs. Consequently, the results obtained in this research paper can change considerably if a different population is considered. Further investigations will need the implementation of an instrument to collect information of clients and consumers, for example, of family and non-family SMEs to verify the results obtained. A fourth limitation could also be that for practical purposes of this empirical research the only enterprises considered were the ones that had between five and 250 workers so in future studies it will be important to consider enterprises that have less than five workers as they represent a little over 50% of enterprises in Mexico in order to verify the results obtained in this research paper.

Finally, a fifth limitation could be that a high percentage of family and non-family SMEs that were interviewed considered that the information requested was classified as confidential so the data provided by family and non-family firms may not necessarily reflect the reality of corporate socially responsible activities that are carried out by this type of enterprises. Further investigations will have to consider the direct participation of business committees or associations to avoid as much as possible the falsehood of the information requested from both family and non-family enterprises.

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