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New-Born Startups Performance: Influences of Resources and Entrepreneurial Team Experiences[1]

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Abstract

This study examines the interaction effects of entrepreneurial team experiences and resources on new-born startup firm performance, from a contextual view point of entrepreneurship. The sample is from a longitudinal panel data of Kauffman Firm Survey conducted over the period of 2005-2012 by the Ewing Marion Kauffman Foundation. Results suggest that financial resources have positive impacts on startup firms' profitability; whereas the impacts of initial firm size on profitability are negative. Startups are more likely to be profitable when the firm size is small at the new-born stage. The positive impact of financial resources on profitability is greater when entrepreneurial teams have strong industry experience; whereas entrepreneurial teams' industry experience and intangible resources have a negative interaction effect on profitability. Entrepreneurial team's startup experience has most negative interaction effects on new-born startup firms' profitability. This finding indicates that the entrepreneurial team's startup experience plays stronger roles in venturing profitable startups when the amount of financial resources and initial firm size are small; however, the team's startup experience and intangible resources have positive interaction effects on new-born startups' profitability.

Keywords: entrepreneurial team, resources, experiences, new-born startup, performance, profitability, contextual entrepreneurship

1. Introduction

Given the fact that most startups are typically launched and grown by teams but not individuals (Klotz, Hmieleski, Bradley, & Busenitz, 2014; Khan, Breitenecker, & Schwarz, 2015), entrepreneurial teams have received broad research attention due to their important roles in acquiring and exploiting critical resources for starting successful businesses (Shrader & Siegel, 2007; Klotz et al., 2014). Entrepreneurial teams are benefited from various experiences of different founder members. Compared with firms founded by solo entrepreneurs, startup firms founded by entrepreneurial teams have advantages in attracting venture capital and completing initial public offerings (Beckman, Burton, & O'Reilly, 2007); achieve better performance in changing industry environments (Robert Baum & Wally, 2003); and are more successful than solo-founder firms (Chandler & Hanks, 1998). Prior research supports a positive relationship between the entrepreneurial teams and startup success (Cooper & Bruno, 1977; Van de Ven, Hudson, & Schroeder, 1984; Cooper, Gimeno-Gascon, & Woo, 1994).

However, the positive impacts of entrepreneurial teams on startup performance have not been found consistently in previous empirical studies (Le, Kroll, & Walters, 2013; Criaco, Minola, Migliorini, & Serarols-Tarrés, 2014). Entrepreneurial teams' influences are found to be highly contextual (Klotz et al., 2014). A better understand of contexts in which entrepreneurs collectively identify, discover, create, and implement opportunities would help greater understand entrepreneurial teams. Therefore, examining entrepreneurial team phenomenon from a contextual view point could help uncover insightful understandings and provide alternative explanations of entrepreneurship. As context itself is multifaceted, the current study responses to the call of Klotz et al. (2014) that much remains need to be understood regarding to the influences of entrepreneurial teams on various

[1]Certain data included herein are derived from the Kauffman Firm Survey release 2.0. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the Ewing Marion Kauffman Foundation.

developmental stages of startups. In the thorough literature review, Klotz et al. (2014) found that the extant entrepreneurial team literature has mainly focused on established firms including firms with IPOs. We need to study founding team's influences in the context of various resource availability at the initial stage of business development. This investigation is important because according to the data of the Bureau of Labor Statistics and Business Dynamics Statistics of Census Bureau, about 31% startups are out of business in the third year, and 51% are out in the fifth years (Robb & Farhat, 2013; Regmi, Ahmed, & Quinn, 2015). How to successfully go through the very early stage of business development is an important task for any new-born startup firm. A number of various theories have been applied to explain the high mortality rate of startup firms. For example, from the perspective of resource based view, entrepreneurial startups' mortality is attributed to limited resources and noncompetitive capabilities (Barney, 1991). Many scholars further argue that in addition to the resources that form the basis of a startup, how human agents exploit resources is critical to firm performance as well (Eisenhardt & Martin, 2000). Thus, a question arises: Can entrepreneurial teams' experiences offset the inherent resource constraints and help a new-born startup firm achieve better performance?

The current study examines the interaction effects of resources and entrepreneurial teams' experiences in the context of initial startup development stage. This study has a few contributions. First, it responses to the call of Klotz et al. (2014) and provides extra empirical evidence of entrepreneurial teams' influences on new-born startup firms to the extant entrepreneurship literature. Second, it helps to reduce research errors as it examines the team-resource-performance associations starting from startup firms' infant period. The widely-documented positive associations among entrepreneurial teams, resources, and firm performance may not necessarily apply to the startup firms at the new-born stage. For example, using incumbent firms as research sample has a risk of "survivorship of bias". Incumbent firms are survivors that have successfully gone through the very tough early stages of business development, but they are only a selected subset of the large number of new-born firms that entered into the market place. A spurious positive association between a certain type of resources and firm performance may be yielded if the selected survival startup firms are employed as the sample. The current study uses a sample of all startups surveyed during the first year when they were just established. Therefore, using a sample of new-born startup firms and investigating firm performance of subsequent years could reduce the survivorship bias of firms. Third, the current study uses 2-year time lag of longitudinal data that better investigates overtime business development. Finally, results of this study also have important practical implementations for entrepreneurs, venture capitalists, business angels, and entrepreneurship educators. New-born startup firms have limited resources available to acquire, therefore, better understanding the association of entrepreneurial team characteristics, resources, and startup performance is strategically meaningful for making startup and investment decisions.

The remainder of the paper is organized as follows. The first section includes background and hypotheses development. The second part presents methodology, data analysis, and empirical results. Discussion and conclusion are included in the end.

2. Background and Hypotheses

2.1 Resources of Startup Firms

In the entrepreneurship literature, it is widely documented that young firms suffer from a liability of newness so that there are only limited resources available for them (Bruton & Rubanik, 2002). Resources are central to the opportunity implementation (Katz & Gartner, 2004). Lack of resources is attributed to be a principle reason for startups' failure (Rujoub, Cook, & Hay, 1995; Reuber & Fischer, 1999).

Startup firms' resources are heterogeneous. A wide range of firm attributes could be considered as resources. In general, resources are all assets, capabilities, competencies, organizational processes, firm attributes, information, knowledge, and so forth that are controlled by a firm (Barney, 1991). Resources enable startups to conceive and implement startup strategies and help a startup improve its efficiency and effectiveness of business venturing (Daft, 1983). Resources typically include intangible, tangible resources, and organizational capabilities (Barney, 1991).

Intangible resources include brand names, patent, copyrights or innovative capacity etc. (Chatterjee & Wernerfelt, 1991). Intangible resources owned by a startup not only show the firm's knowledge but also reflect its ability to generate specific knowledge (Hitt, Bierman, Shimizu, & Kochhar, 2001). Intangible resources add value into products (Spender, 1996), thereby compared with tangible resources they are more likely to gain competitive advantage to the firm (Hitt et al., 2001). Intangible resources "open up the possibility for differentiation" and achieve high performance (Bettis, 1981).

Tangible resources include financial and physical resources. Financial resources are inputs through internal or

external funds. Internal funds consist of liquidity at hand and unused debt capacity to borrow at normal rates. External funds consist of new equity and possibly high-risk debts (Chatterjee & Wernerfelt, 1991). Financial resource is crucial to the survival and growth of a startup firm. Financial constraint is one of the major resource constraints that cause startups to fail. The amount and availability of financial resources also influence a firm's likelihood of taking pioneering and/or risk-taking behaviors (Schoenecker & Cooper, 1998).

Physical resources of a firm, such as plant, equipment, and machine etc., are characterized by fixed capacity (Chatterjee & Wernerfelt, 1991). The number of employees also has been seen as a critical type of resources that is strongly associated with startup performance (Aldrich & Auster, 1986; Venkataraman & Low, 1994; Carter, Williams, & Reynolds, 1997). Typically, both total asset and the number of employees are used to represent a startup's firm size. Previous empirical studies demonstrate that the employment size at the start-up stage influences the extent to which a business will survive and grow (Birley, 1985). For new-born startup firms, the importance of resources to firm performance could be bigger in the context of the initial stage of business development.

2.2 Entrepreneurial Teams

Although resources are particularly critical to new venture survival, growth, and success (Wiklund & Shepherd, 2003), entrepreneurs' capability of acquiring, managing, and leveraging resources in both efficient and productive ways is another important contributor to startup firms' success (Bruton & Rubanik, 2002). As StevensonGumpert (1985) argued, given the fact that most startups do not own or control sufficient resources, it is more important for entrepreneurial teams to leverage their individual resources to build up organizational resources in order to achieve maximized outputs. Entrepreneurial teams' skills, abilities, and ways of combining assets and people into venturing process form organizational capability. Having strong organizational capability, entrepreneurial teams are able to utilize a set of limited resources to create an unique bundle of resources that helps establish sustainable competitive advantage at the very early stage of business development (Barney, 1991; Greene & Brown, 1997). When startup firms start to grow, they also need strong organizational capability to keep acquiring and reorganizing firm resources (Miller, Friesen, & Mintzberg, 1984). For team-founded startup firms, organizational capability is largely determined by entrepreneurial teams. Team members with various backgrounds bring in a wide variety of life experiences, skills, knowledge, personalities, and social attributes to the entrepreneurial team. Because previous industry, working, and life experiences are major sources of informal learning, each team member's previous experiences can produce tacit knowledge that is transited to the team, and will be further transformed into the firm-level knowledge. Entrepreneurial teams have benefits of larger stock of tacit knowledge and organizational capability, therefore startups founded by teams appear more successful than firms founded by solo entrepreneurs (Chandler & Hanks, 1998).

2.3 Entrepreneurial Team Experiences and Resources: Interaction Effects on New-born Startup Performance

Entrepreneurial teams' experiences have been found to have strong positive impacts on performance. For example, ShraderSiegel (2007) found that experienced entrepreneurial teams are more productive than less experienced teams. Having strong entrepreneurial team experiences, new-born startups are able to overcome the liability of newness and resource constraints. Entrepreneurial teams' industry experience and previous startup experience are broadly identified as two important experiences that determine entrepreneurial team's success.

2.3.1 The Moderating Role of Industry Experience of Entrepreneurial Team

Experiences of industry and/or the line of business generate domain-relevant tacit knowledge of 'know-what', 'know-how', and 'know-who' (Cooper et al., 1994). Tacit knowledge is accumulated from previous experiences in the same or similar businesses. Important tacit knowledge of 'know-what', 'know-how' and 'know-who' of the industry and/or the business sector is transited into an entrepreneurial team when the team is formed. Entrepreneurial teams obtain necessary domain knowledge through industry experiences of team members. Each member's industry experience provides the team with valuable skills, great information about customer needs, and sophisticated knowledge about how the industry works, including the knowledge of products, technology, operations, market, and customer problems etc. (Delmar & Shane, 2003). Team-level industry experience indicates an entrepreneurial team's knowledge of the industry and/or knowledge of the line of business sectors relevant to the startup firm (Cooper et al., 1994). It strengthens the team's practical and problem solving skills (Lundvall & Johnson, 1994). Strong industry experience helps entrepreneurial teams reduce the uncertainty of venturing, make better venturing decisions, and take better efforts in dynamic environments of the industry (McMullen & Shepherd, 2006).

Entrepreneurial team industry experiences and financial resources. Previous empirical studies provide supports for significant impacts of industry experience on startups' profitability, survival, and growth (Cooper &

Gimeno-Gascon, 1992; Cooper et al., 1994; Westhead, 2000; Ganotakis, 2012; Muñoz-Bullon, Sanchez-Bueno, & Vos-Saz, 2015). Strong industry experience enables entrepreneurs to establish strong social network (Ardichvili, Cardozo, & Ray, 2003). It helps startups not only leverage their networks of prior suppliers or customers, but also create and maintain functional, personal, or social relationships in the industry. Entrepreneurial teams that have strong industry experience are able to access a wide breadth of resources, and access resources easier (Kor, Mahoney, & Michael, 2007). Previous research shows that entrepreneurial team's industry experience has a direct positive association with the debt level of a firm (Bates, 1990).

In addition to facilitate resources accessibility for startup firms, at the initial stage of business development, entrepreneurial teams that have strong industry experience are better in utilizing limited resources. Strong industry experience enables the team to better implement discovered opportunities, serve customer needs better, and solve problems much quickly. It reduces the likelihood of choosing poor decisions on resources allocation; decreases the search costs of new technology (Lundvall & Johnson, 1994); and helps startup firms survive and thrive with less financial capital than their less experienced counterparts (Chandler & Hanks, 1998). Thus:

> *H1a: Entrepreneurial teams' industry experience positively moderates the relation between financial resources and new-born startup performance: more financial resources lead to higher profitability, and higher level of industry experience of entrepreneurial teams facilitate this relationship.*

Entrepreneurial team industry experience and startup size. Entrepreneurial teams' industry experience can help new-born startups overcome the liability of smallness. BrushChaganti (1999) found an interaction effect of team experience/competences and firm size (in a form of the number of employees) on startup firm performance. The authors pointed out that the moderating effect of firm size is uncertain and it may be positive in some cases while negative in others. They attributed this unpredictable size effects to the different combinations of team and organizational resources that are correlated to firm performance. At the very early life stage, startups are usually small in size. Small firm size limits a firm's access to other necessary resources that are required for business operation and development, thus it hinders the firm's performance (Cooper & Dunkelberg, 1986). However, small firms also have an advantage of flexibility, and they are able to make fast venturing decisions and respond to the market quickly. With this regard, smallness is not necessarily a limitation for new-born startups. Entrepreneurial teams' industry experience can offset the downside of smallness because strong tacit knowledge of 'know-what', 'know-how' and 'know-who" enables the startup firm access a broad of necessary resources and helps the firm act in the business segments in an efficient, productive, and less costly way (Lundvall & Johnson, 1994). In the context of initial business development, strong experienced entrepreneurial teams assist small startup firms avoid unnecessary costs, and choose optimized solutions for business operation and development. Strong industry experience reduces the uncertainty associated the venturing process, offsets the liability of newness and smallness, and facilitates the process of establishing new-born startups' legitimacy in the market. When the startup firm is growing into large firm size, the domain-relevant knowledge generated by the entrepreneurial team only will no longer meet the needs of firm growth. The firm will need larger stock of specific knowledge for each business unit; therefore entrepreneurial teams' experiences would have smaller impacts on firm performance when the startup's firm size is large. Thus, industry experience of entrepreneurial teams would have stronger roles in determining startup performance in small-sized rather than in large-sized firms.

> *H1b: Entrepreneurial teams' industry experience and startup firms' initial firm size have a negative interaction effect on performance: the association of entrepreneurial teams' industry experience and profitability is stronger when the startup firm's initial firm size is small.*

Entrepreneurial team industry experience and intangible resources. Intangible resources include brand names, patent, copyrights or innovative capacity etc. Intangible resources owned by new-born startups are typically resulted from licensing and/or founder's previous activities of innovation. Patent and copyrights are the first level success of innovation, however, it is highly uncertain about the results of a patens/or trademark before it is being commercialized into market place. Startups must have strong organizational capabilities to transform intangible resources into successful outputs. Entrepreneurial teams that have strong industry experiences have great tacit knowledge of 'know-what' and 'know-how' of the industry and business segments. Rich industry experiences are very useful in foreseeing potential market value, identifying better business opportunities, and choosing right patens and/or trademarks to commercialize (Kor et al., 2007). Therefore, industry experiences help reduce uncertainty associated with resource employments in the industry (McMullen & Shepherd, 2006). In addition to offset the uncertainty associated commercializing intangible resources, industry experience of entrepreneurial team helps startups quickly establish legitimacy in the market with lower costs of search and commercialization (Lundvall & Johnson, 1994); therefore increases the likelihood of profitability.

H1c: Entrepreneurial teams' industry experience positively moderates the relation between intangible resources and new-born startup performance: more intangible resources lead to higher profitability, and higher level of industry experience of entrepreneurial teams facilitate this relationship.

2.3.2 The Moderating Role of Entrepreneurial Teams' Previous Startup Experiences

Previous experiences of a specific job and position generate specific knowledge, a type of knowledge that is associated with productivity in the same occupations (Ganotakis, 2012). Members of entrepreneurial teams obtain specific knowledge of entrepreneurship through previous startup experiences, namely the number of new businesses a member of an entrepreneurial team was involved in the venturing process, and the level of management role he/she had played previously. Starting up a new business is a complicated and dynamic process. Entrepreneurial teams that already have startup experiences would have stronger capabilities of future business development than inexperienced teams (Brush, Manolova, & Edelman, 2007). Previous studies have shown that startup experience is a useful determinant for new venture performance (Dyke, Fischer, & Reuber, 1992). Entrepreneurs' startup experience enables startup firms to successfully implement and adapt to changes in external environments (Siegel, 1999; Hitt et al., 2001; Lee & Tsang, 2001). It increases the likelihood of establishing a successful new startup (Box, White, & Barr, 1993). Startup experience is documented as one of the most significant factors venture capitalists traditionally use to weight in their funding decisions (Stuart & Abetti, 1990). Habitual entrepreneurs (those with multiple prior experiences of startup) have broader social networks and are more effective in obtaining knowledge of finance and management (Mosey & Wright, 2007). Strong startup experience enables an entrepreneurial team to minimize uncertainty, and helps the startup quickly establish routine and day-to-day activities. It reduces the costs of leveraging financial resources to pursue a business opportunity (Muñoz-Bullon et al., 2015), resulting in more profitable venturing.

H2a: Entrepreneurial teams' entrepreneurship experience positively moderates the effects of financial resources on new-born startup performance: more financial resources lead to higher profitability, and higher level of startup experience of entrepreneurial teams facilitate this relationship.

The influence of initial firm size on new-born startup firms' performance is a two-edged sword. Small-sized venturing requires less resource endorsement and small-sized startups have advantages of being flexible and speedy; whereas these firms have resource constraints that might hinder ongoing business operations and future development. On the other hand, large-sized startup firms are able to access more resources and quickly establish legitimacy, therefore have more competitive advantages in the market. However, large-sized venturing requires large amount of resource commitment so that these firms take longer time to achieve profitability than their counterparts; therefore small-sized new-born startup firms are more likely to obtain profitability in three years.

When entrepreneurial teams have strong startup experience, they have great specific knowledge of business venturing that reduces uncertainty associated with the venturing process. Strong startup experience is very useful in determining where to allocate resources; what day-to-day activities and expenses are necessary for initial business operations; and what venturing steps are the least costly but productive etc., therefore entrepreneurial teams' startup experience can offset the negative impacts of initial firm size on performance and increases the chances of profitability.

H2b: Entrepreneurial teams' startup experience and startup firms' initial firm size have a negative interaction effect on profitability: small-sized startup firms are more likely to be profitable in three years; this relationship is stronger when entrepreneurial teams have high level of startup experience.

Regarding to the intangible resources, because entrepreneurial teams have previously encountered issues associated with commercializing a patent/trademark into market place, they have experiences of finding financial capital, hiring new employees, and establishing contacts with potential customers. Experienced entrepreneurial teams are able to implement venturing efforts in the efficient and less costly manner. Thus, entrepreneurial teams' startup experience should have a positive interaction effect with intangible resources on new-born startup firms' profitability.

H3b: Entrepreneurial teams' startup experience and intangible resources have a positive interaction effect on new-born startup performance: more intangible resources are more likely to be associated with high level of profitability when entrepreneurial teams have high level of startup experience.

3. Method

3.1 Sample

Data was collected via Kauffman Firm Survey conducted by the Ewing Marion Kauffman Foundation over the period 2005-2012. Since the focus of this study is the initial stage of business development, data of the period of

2005-2007 was used. The random sample of this survey was obtained from the list of new business started 2004 that were included in the Dun & Bradstreet (D&B) database, a rough total of two hundred fifty thousand businesses. A random sample of 32,469 businesses was released for data collection on the Baseline Survey, which was conducted between July 2005 and July 2006. The research team completed interviews with principals of 4,928 businesses that started operations in 2004, which translates to a 43 percent response rate when the sampling weights were applied. A self-administered Web survey and Computer-Assisted Telephone Interviewing (CATI) were used to collect data, and KFS respondents were paid $50 to complete the interview. CATI completes accounted for 3,781 (77 percent) and Web completes accounted for 1,147 (23 percent) of the interviews. The results across sampling strata show that 2,034 interviews were completed in the two high technology strata, and the remaining 2,894 interviews were completed among non-high-tech businesses.

The First Follow-Up Survey sample consisted of the 4,928 businesses that completed the Baseline Survey. The First Follow-Up was conducted between June 2006 and January 2007, and 3,998 interviews were completed—an 89 percent response rate after adjusting for the sample weights. As the Baseline Survey, respondents were paid $50 to complete the interview, which was offered either on the Web or through CATI. In the First Follow-Up, a significantly larger percentage of interviews was completed through the Web survey (2,366 or 59 percent) than in the Baseline; Respondents to CATI in the First Follow-Up survey accounted for 41 percent (1,632 interviews).
The second follow-up survey was conducted among 4,523 KFS businesses. This included businesses that completed both the baseline and first follow-up surveys, and those not able to be interviewed during the first follow-up. Businesses identified as no longer operating during the first follow-up were excluded, as were a small number that adamantly refused to participate in the first follow-up. The second follow-up was conducted between May and December 2007, during which 3,390 interviews were completed and 406 businesses were identified as no longer operating. During the second follow-up, 63% of the interviews (2,127) were completed through the Web survey, with CATI completes accounting for 37% (1,263 interviews).

3.2 Measures

3.2.1 Dependent Variables

Dependent variables of this study are measured by profitability. Data was obtained from the second follow up survey. Profitability is measured by a dummy variable. Respondents were asked whether the business loss or profit in year 2005. Answer for "loss" was coded as 0, "profit" was coded as 1.

3.2.2 Independent Variables

3.2.2.1 Entrepreneurial Team Experiences.

Entrepreneurial Team Experiences are measured by average industry experiences of entrepreneurial team, and average startup experience of entrepreneurial team. Each owners' industry experience is measured by owners' years of working experience of an industry in which the business competes. The respondents were asked "how many years of working experience have you had in this industry—the one in which the business competes?" Team level of owners' industry experience is calculated by dividing total years of industry experience of the founding team by the total number of owners of the startup. Each owners' previous startup experience is captured by asking respondents: 1) "how many other new businesses have you started besides?" Then sum all answers together. 2) "if you have other new businesses started besides, were (was) these new businesses in same industry as this business"? The answer is coded as 1 (yes) or 0 (no). Then sum all owners' answers for "yes" together. 3) The number of owners who have more than 5 other new businesses started besides. Each owner has more than 5 other new business started besides was coded as 1, otherwise 0. Then sum all answer "1" together. The sum of the results from the three items measures the level of startup experiences. Team level of entrepreneurial expertise is measured by average startup experience. That is, dividing the total level of startup experience by the total number of owners of the firm.

3.2.2.2 Resources

Intangible resource. Intangible resource is measured by patents, copyrights, and trademarks. This variable was calculated by the total number of patents, copyrights, and trademarks owned by a startup.

Initial firm size. The initial size of a startup is measured by two indicators: initial number of employees and initial firm asset a startup owns. The number of employees is measured by a dummy variable. The number of employees is more than 1 was coded as 1, otherwise 0. The initial total assets in year one was used: 0 = small initial assets of $10,000 or less; 1 = medium or large assets with initial assets greater than $10,000.

Financial resource is measured by access to debt, which is measured by the maximum business line of credit. Startups' maximum business line of credit is above $1 was coded as 1, otherwise 0.

3.2.3 Control Variables

Both firm age and industry type affect startup performance. This sample has controlled the age of startup firms, so industry type was chosen to be the control variable: technological and non-technological industry (dummy coded as 1 and 0), by matching NAICS code with SIC code.

3.3 Data Analysis

The purpose of the current empirical test is the interaction effects of multiple independent variables on startup performance. In order to avoid multicollinearity problem, all independent variables were centered (Jewell, 2004). Centering is defined as subtracting the mean (a constant) from each score, yielding a centered score. Centering is an important step when testing interaction effects in multiple regression to obtain a meaningful interpretation of results (Robinson & Schumacker, 2009). When variables have been centered, the intercept has no effect on the collinearity of the other variables (Belsley, Kuh, & Welsch, 1980). Therefore centering can be used to reduce the issue of multicollinearity.

Outliers were excluded after testing residuals. In addition, all models were appropriately weighted before data analysis.

A series of hierarchical multiple binary logistic regression model was used to test the direct and interaction effects of entrepreneurial team experiences and resources on profitability.

4. Results

Table 1 provides correlation coefficients for the variables used in the models. Because the variables included into this study are in the form of ordinal, interval or dichotomous variable. Spearman correlation tests were conducted. Spearman correlation is the most common correlation for use with two ordinal variables or an ordinal and an interval variable. These correlations provide initial indications of strong relationships between entrepreneurial team experiences, resources, and performance. No evidence of multicollinearity was indicated.

Table 1. Spearman's Rho Correlation

Variable		1	2	3	4	5	6	7
1.	Profitability	1						
2.	ET industry experience	.094	1					
3.	ET startup experience	.078**	.539***	1				
4.	The number of employees	.230***	-.005	.014	1			
5.	Total assets	.322***	.039*	.067***	.246***	1		
6.	Intangible resources	-.009	-.008	.038*	.056***	.039*	1	
7.	Access to Debt	.147***	.068***	.100***	.132***	.161***	-.002	1

Table 2. Regressions results for Profitability

	Profitability	
Models	b	EXP(B)
Main Effects Model		
Industry	.055	1.056
The number of employees	.046	1.047
Total assets	-.334***	.716
Intangible resources	.006	1.006
Access to debt	.225*	1.252
Founding Team Experience		
Industry Experience	.034***	1.034
Startup Experience	-.066	.936
	R^2	
Hosmer-Lemeshow test	$\chi 2(df)=8.208(8)$, p=.413	

Table 3. Results for interaction effects

Model A: Entrepreneurial Team Experience X Intangible Resources		
	Profitability	
Models	b	EXP(B)
Industry	0.053	1.054
Industry experience	.033***	1.034
Startup experience	-.07	.932
Resources		
Intangible resources	.006	1.006
The number of employees	.047	1.048
Total assets	-.331	.718
Access to debt	.221*	1.248
Industry experience X intangible resources	-.006*	.994
Startup experience X intangible resources	.086*	1 .09
R^2	R^2 =0.048	
Hosmer-Lemeshow test	$\chi 2$(df)=7.949 (8), p=.438	

Model B: Entrepreneurial Team Experience X Number of Employees		
	Profitability	
Models	b	EXP(B)
Industry	0.05	1.051
Industry experience	.033***	1.033
Startup experience	.087	1.091
Resources		
Intangible resources	.006	1.006
The number of employees	.059	1.061
Total assets	-.338***	.713
Access to debt	.212	1.236
Industry experience X Number of Employees	.002	1.002
Startup experience X Number of Employees	-.374*	.688
R^2	R^2 =0.050	
Hosmer-Lemeshow test	$\chi 2$(df)=10.009 (8), p=.264	

Model C: Entrepreneurial Team Experience X Total Assets

Models	Profitability b	EXP(B)
Industry	0.056	1.057
Industry experience	.03***	1.03
Startup experience	.248	1.282
Resources		
Intangible resources	.006	1.006
The number of employees	.046	1.047
Total assets	-.317***	.728
Access to debt	.215	1.239
Industry experience X total assets	.007	1.007
Startup experience X total assets	-.481**	.618
R^2	R^2 =0.048	
Hosmer-Lemeshow test	$\chi 2$(df)=7.472 (8), p=.486	

Model D: Entrepreneurial Team Experience X Access to Debt

Models	Profitability b	EXP(B)
Industry	0.06	1.062
Industry experience	.033***	1.031
Startup experience	.011	1.011
Resources		
Intangible resources	.006	1.006
The number of employees	.051	1.053
Total assets	-.327**	.721
Access to debt	.185	1.203
Industry experience X Access to Debt	.036*	1.037
Startup experience X Access to Debt	-.661*	.516
R^2	R^2 =0.051	
Hosmer-Lemeshow test	$\chi 2$(df)=6.36 (8), p=.607	

Table 2 and 3 presents the results of regression analyses. Normal binary logistic model was used to examine the direct and interaction impacts of resources and entrepreneurial team experiences (industry experiences and startup experiences) on profitability. A total of six models were tested. The first model examined the effects of control variable only. The second model examined the effects of control variable and main effects. The following

four models include the additional two-way interaction terms. The actual test of hypotheses is the significance of the model change from the control variable model to the direct effect model. All results from normal binary logistic regression models show that Omnibus test of Model coefficients are significant at p=.000 level, which indicates the model changes are significant. The Chi-squares for H-L (Hosmer-Lemeshow test) of all normal binary logistic regression are not significant, demonstrating that the logistic models are good fit with the data.

Results show that financial resources (access to debt) showed a significantly impact on profitability (.225, p=.01). Total asset was found to have significant negative impacts on profitability (-.334, p=.000). The number of employees and intangible resources were found not having significant impacts on startup firms' profitability of the year three.

Regarding to the individual impacts of entrepreneurial team's experiences, the results show that only industry experience significantly impacts startup's profitability (.034, p=.000). Surprisingly, entrepreneurial team's startup experience was found not having significant impacts on new-born startup firms' profitability.

H1a predicts a positive interaction effect of industry experience and financial resources (access to debt) on profitability. Results show that industry experiences and access to debt have significant positive interaction effects on profitability (.036, p=.01). H1a is supported. This finding indicates that when a startup has large financial resources and the entrepreneurial team has strong industry experience, this startup firm has more odds of making profits in three years. Entrepreneurial teams' startup experience and financial resources have a negative interaction effect on the startup firm's profitability in three years (-.661, p=.01), supporting H2a, but in an opposite direction. Entrepreneurial teams' strong startup experience is more likely associated with profitability when startup firms do not have access to financial resources; whereas when startup firms have access to financial resources, less startup experienced entrepreneurial teams are more likely to make profitable venturing.

H1b and H2b hypothesize interaction effects of initial startup firm size and entrepreneurial team experiences on performance. Results show that entrepreneurial teams' industry experience and initial firm size (number of employees and total asset) do not have significant interaction effects on profitability. In the main effect model, entrepreneurial teams' industry experience is found to be significantly related to profitability (.034, p=.000). In the contingency model, no significant interaction effect of industry experience and firm size was found. H1b was rejected. This finding indicates that the influences of entrepreneurial teams' industry experience on profitability do not differ across initial firm sizes of startups.

On the other hand, results show significant moderating effects of entrepreneurial teams' startup experience on the relationship between initial firm size and profitability. Startup experience and the number of employees have a joint negative effect on profitability (-.374, p=.001). The joint effect of entrepreneurial team's startup experience and total asset is also negative (-.484, p=.001). H2b was supported. In the main effect model, it shows a negative relationship between initial firm size of total asset and profitability (-.334, p=.000), and no significant direct effect of number of employees on profitability. The results of the main effect model show that small-sized startup firms are more likely to generate profits in three years than medium/large sized counterparts. Medium/large sized new-born startup firms have more resources commitments in the very early stage of business development, therefore they are less likely to make profits in three years. However, the significant negative interaction effect of team's startup experience and startup firms' initial firm size on profitability (-.481, p=.001) indicate that the negative main effect of initial firm size on profitability depends on entrepreneurial teams' startup experience. The association of small initial firm size and profitability is stronger when entrepreneurial teams have high level of startup experience. Strong startup experience and size can offset resource constraints, increasing the chance of obtaining profits in the first three years of firm life. Put in another way, entrepreneurial teams' startup experience has significant impacts on new-born startup firms' profitability when startup firms' initial firm size is small. H2b was supported.

H1c and H2c hypothesize the interaction effects of team experiences and intangible resources on performance. Results demonstrate that team industry experiences and intangible resources have significant negative interaction effects on profitability. When startups have more intangible resources, strong industry experienced new startups have higher likelihood of having negative profitability in the third year (-.006, p=.01). H1c is supported, but it is in an opposite direction. The main effect model shows a significant positive impact of industry experience on profitability (.033, p=000). The negative interaction effect of entrepreneurial teams' industry experience and intangible resources indicates that the amount of intangible resources weakens the positive influences of entrepreneurial teams' industry experience on profitability. Strong industry experienced teams are more likely to make profits in the third year when new-born startup firms have less intangible resources.

Startup experience has significant impacts on startup profitability (.086, p=.01). When startups have high intangible resources, strong startup experience significantly increases the likelihood of achieving positive profitability in three years. H2c is supported.

Table 4 shows a summary of all results.

Table 4. Results Summary

DV / IV	*Hypotheses*	*Profitability*
Intangible resources		*No sig.*
Access to Debt		***Sig. (.225, p=.01)***
Total assets		***Sig. (-.334, p=.000)***
The number of employees		*No sig.*
Industry Experiences		***Sig. (.34, p=.000)***
Startup experience		*No sig.*
Industry experience × access to debt	*H1a*	***Sig. (.36, p=.01)***
Industry experience × total assets	*H1b*	*No sig.*
Industry experience × number of employees	*H1b*	*No sig.*
Industry experience × intangible resources	*H1c*	***Sig. (-.006, p=.01)***
Startup experience × access to debt	*H2a*	***Sig. (-.661, p=.01)***
Startup experience × total assets	*H2b*	***Sig. (-.481, p=.001)***
Startup experience × number of employees	*H2b*	***Sig. (-.374, p=.01)***
Startup experience × intangible resources	*H2c*	***Sig. (.086, p=.01)***

5. Discussion

Although extant empirical literature has widely documented significant impacts of startup firms' resources and entrepreneurial team's experiences on startup performance, few studies tested the interaction effects of resources and team experiences on a sample of new-born startup firms that are at the infant stage. Moreover, the dependent variables used to measure startup performance in the majority of the current literature are survival, productivity, or growth. Few studies shed lights on the early years of profitability, a performance measure that is vital for startups to stay in business. The purpose this study is to empirically test the influences of entrepreneurial teams on new-born startup firms' performance, from a contextual view point. Specifically, this study aims to examine entrepreneurial teams' experiences on new-born startup firms' profitability in various contexts of resource availability.

Findings of this study show that financial resources (in the form of asses to debt) are vital for new-born startup firms' profitability. Entrepreneurial teams' industry experiences strengthen the financial resources and profitability relationship. This finding is consistent with previous findings of the extant entrepreneurship literature. Entrepreneurial teams' industry experience generates strong 'know-what', 'know-how' and 'know-who of the industry and/or business sectors, so that it enables new-born startup firms to access more financial resources and utilize resources better in the process of startup venturing. Moreover, strong entrepreneurial teams' industry experience helps reduce costs of searching new materials and technology; therefore, new-born startups that have strong industry experienced teams have more chances of being profitable in the first three years of life span.

However, the interaction effect of entrepreneurial teams' startup experience and financial resources is negative on profitability. Entrepreneurial teams' strong startup experience weakens the positive main effect of financial resources on profitability. Strong startup experienced teams obtain profitability better when the startup does not have access to financial resources. One explanation for this finding is that entrepreneurs who have strong specific knowledge of how to establish a startup may not have sufficient knowledge of business management and administration. When these entrepreneurs access to large amount of financial resources, they may not be able to make right decisions of business operations. This result indicates that although it has been broadly accepted that

financial constraints faced by entrepreneurs is one of the major reasons of startup failure, the impacts of financial resources on startup performance are not conclusive. Great access to debt may positively strengthen the startup performance in some cases, however, they may be also negatively associated with performance in other cases. Moreover, the impacts of access to debt are contingent on specific experiences of the entrepreneurial team. To better understand the influences of financial resources and entrepreneurial team in the early period of firm life, more studies need to be done. Future research needs to examine the influence of early financial structure, sources and costs of finance on new-born startup performance, and better understand the role entrepreneurial teams play on this relationship.

Results also show that different types of resources and entrepreneurial team experiences have heterogeneous impacts on startup performance. Entrepreneurial teams' startup experience has a positive joint effect with intangible resources on profitability; whereas entrepreneurial teams' industry experience and intangible resources have a negative joint effect on profitability. It indicates that entrepreneurial teams' startup experience is more useful in mobilizing intangible resources to achieve profitability than industry experience. One explanation for this unexpected result is that although strong industry experiences generate great tacit knowledge of 'know-what' and 'know-how' of the industry that enables entrepreneurs to foresee potential market value, identify better business opportunity, and choose right patens and/or trademarks to commercialize, commercializing patents into market place and utilizing intangible resources are practical issues. Startup experienced entrepreneurial teams have previously encountered issues associated with commercializing a patent/trademark into market place. They have rich experiences of practices so that they are able to implement venturing efforts less costly. Moreover, strong industry experience could possibly lead to strong overconfidence in a particular business sector so that it might hinder entrepreneurs from searching new information, knowledge, and technology required for applying intangible resources into business settings.

Firm size is showed to have negative influences on profitability. Although some entrepreneurship scholars argue that large firm size is associated with better performance of entrepreneurial firms because they are able to access large amount of resources, findings of this study support a negative effect of initial firm size on startup firms' early years' profitability. Startup venturing is a dynamic and uncertain process, large amount of resource commitment in the early venturing stages might scarify the flexibility and speed of change. Small initial sized startups are more likely to be profitable in the third year. Entrepreneurial teams' industry experience does not have joint effects with the startup's initial firm size. Strong industry experience of the entrepreneurial team positively increases the chance of obtaining profitability. Such influence of entrepreneurial team won't vary across the initial firm sizes.

However, entrepreneurial teams' startup experience has mostly negative moderating influences on the relationship between resources and profitability. Moreover, findings of this study also indicate that entrepreneurial teams' startup experience plays more important roles in small sized startups, where direct impacts of founders are more likely to take place. An explanation for these findings is that specific knowledge of business venturing that is obtained through a few startup experiences may not be able to be successfully transited into necessary knowledge required for business management. New-born startup firms mostly operate in very dynamic and changing environments, entrepreneurs may need longer time to learn from past experiences. Moreover, the specific knowledge of business venturing differ from the domain relevant knowledge of business operation and management. Beside knowledge obtained through startup experience, entrepreneurs need to acquire other types of knowledge for better firm performance.

Findings of the current study provide an extra empirical evidence of the interaction influences of entrepreneurial teams and resources on new-born startup firms' performance from a context view point. It helps better understand entrepreneurial team and provide alternative explanations for entrepreneurship. Results suggest that entrepreneurs, as unique heterogeneous resources of a startup firms, are important contributor to outperformance (Alvarez & Busenitz, 2001). Entrepreneurial teams' knowledge and experience play important roles in helping new-born startup firms successfully adapt to external environments and achieving superiority in performance. However, the influences of entrepreneurial teams are contingent in the various contexts of resource availability.

6. Conclusion

This study empirically tests the joint impacts of resources and entrepreneurial teams on new-born startup performance. It provides an extra empirical document for the importance of entrepreneurial teams to startup performance at very beginning stage of business development. Results of this study have potentially important implications for understanding entrepreneurial teams, practices of new-born startup, and venture investment decision making. This study also reveals that a contingent approach could give us a deeper insight into the relationships among entrepreneurial team, resources, and startup performance.

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Analysis of Critical Success Factors Influence on Critical Delays for Water Infrastructure Construction Projects in the Abu Dhabi emirate Using PLS-SEM Method

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Abstract

The objective of this study is to investigate the significance impact of critical success factors on critical delays in the field of water infrastructure construction projects (WICPs) in the Abu Dhabi emirate in particular. Investigation was conducted utilizing quantitative approach by means of questionnaire survey to examine the understanding of professionals engaged in water infrastructure construction towards several critical success factors influencing critical delays. A total of 323 completed responses from owners, consultants and contractors representatives were gathered against 450 distributed questionnaires.

The gathered questionnaires were analysed using an advanced multivariate statistical method of Partial Least Square Structural Equation Modelling (PLS-SEM). Data analysis was conducted in two major phases. The first phase involved a preliminary analysis of the data, to ensure that the data adequately meet the basic assumptions in using SEM. The second phase applied the two stages of SEM. The first stage included the establishment of measurement models for the latent constructs in the research. After confirming the uni-dimensionality, reliability and validity of the constructs in the first stage, the second stage developed to test the research hypotheses through developing the structural models. The results indicated that Project Management Process (PMP), Project Manager's Competency (PMC), Project Team's member Competency (PTC), Project Organizational Planning (POP), Project Resources' Utilization (PRU) and Project Organizational Commitment (POC) had significant positive effects on Critical Delay Factor Evaluation (CDFS). From the results of moderation analysis revealed that Project Benchmark Characteristics (PBC) is positively moderate the effects of Project Management Process (PMP), Project Manager's Competency (PMC) and Project Team's member Competency (PTC) and Project Organizational Planning (POP) on Critical Delay Factor Evaluation (CDFS).

Keywords: Abu Dhabi, critical delay, critical success factors, structural equation modelling, PLS-SEM

1. Introduction

The construction industry in general and including water infrastructure sector is large, complex, volatile, risky, and requires tremendous capital outlays and tight money (Tumi, Omran & Pakir, 2009). It provides a bigger challenge to maintain its scheduled time, budgetary cost, and appropriate quality (Elawi, Algahtany & Kashiwagic, 2016). A prime critique coming up against the construction sector including water infrastructure construction projects is the increasing rate of occurred delays in construction project delivery (Tumi et al., 2009). From the available review, several studies have spotlight on identifying causes of project delays or critical success factors; however, none of the previous conducted studies have investigated relation among the critical success factors and critical delays in construction industry, in general, nor in water infrastructure construction projects in particular. Hence, this study adopted Structural Equation Modeling (SEM) to assess the influence of critical success factors on critical delays. The analysis selected PLS approach to Structural Equation Modeling (SEM) as this approach is more recommended and advised as most appropriate method for testing the causal relation (Hair, ringle & Sarstedt, 2011). In addition, according to Ng, Tang and Palaneeswaran (2010), Structural

Equation Modeling shows better functionality than other multivariate techniques including multiple regression, path analysis, and factor analysis.

2. Literature Review

2.1 Critical Delays Review

Numerous studies have questioned several dissimilar factors that lead to delay in various types of infrastructure construction projects. Generally; delay in construction projects is regarded as one of the most repeated difficulties in the construction field and it has an unfavorable impact on construction project success against time, cost, quality, and safety and no kind of construction projects has got out of the astounding ghost of time overruns (J. Sweis, Rateb Sweis, Abu Rumman, Abu Hussein & Dahiyat, 2013). The causes and impacts of delay factors in construction industry not only vary from project to project but also from geographical location to another due several reasons including and not limited to the environmental, the topographical and the technological constraints (Sweis, 2013; Shebob, Dawood & Shah, 2012). Shebob et al. (2012) mentioned in his study that in addition to country and projects variances in term of delay there is a certain projects are only a few days late while some projects are delayed by over a month or a year.

Kazaz, Ulubeyli and Tuncbilekli (2012) examined various causes of time delay in the context of Turkish construction industry and the levels of their significance, design and material changes, delay of payments and cash flow problems are the most predominant delay factors in Turkish construction industry. Motaleb and Kishk (2013) examined problems causing delays on construction projects in the United Arab Emirates; they investigated the causes and effects behind the delays that pertain to the delivery of construction projects in the United Arab Emirates, they identified and ranked the most key factors as follows: Change orders, Inadequate capabilities of client delegate, Delay in decision making by client delegate, Poor experience of client in construction, Insufficient management and supervision, Lack of experience of project team, Inflation/prices fluctuation, Poor time estimating, Construction materials delivery related problems, Improper project planning / scheduling, Imprecise cost estimating, High bank interest rate, Client's poor financial statement, Extravagant restriction to client ,Improper construction methods.

Elawi et al. (2016) investigated the reasons of the time delay in infrastructure projects in the Mecca province in Saudi Arabia. Their study concluded that factors contributed for the majority of time overruns were; land acquisition, contractor' lack of expertise, change order, and obtaining approvals and permits against underground utilities. Obodoh and Obodoh (2016) studied the major causes and effects of cost overrun and time delays in the infrastructure construction projects in Nigeria, the study revealed that, insufficient number of equipment, Imprecise time assessment, payment difficulties, change orders, poor cost estimate, inadequate site supervision and management, lack of modern equipment, shortage of construction materials, poor skills of project team, inaccurate project planning and scheduling and contractors' financial difficulties were the main causes of delay in Nigeria's construction projects. Durdyev, Omarov and Ismail (2017) studied causes of construction delay in infrastructure construction projects of residential nature in Cambodia, the study showed that shortage of materials on site, unrealistic project scheduling, late construction material delivery, shortage of competent labor, change orders, complexity of project, labor absenteeism, delay in payment by the owner against invoiced completed works, poor site management, delay by subcontractor, accidents due to inadequate site safety are ranked and evaluated by the representatives of two main stakeholders of contractors and consultants as the major causes of project delays in Cambodia.

From the presented literature review and many previous several researches, five (5) delays were identified as common in many studies in different geographical areas and various types of construction industries (Aziz & Abdel-Hakam, 2013; Alzaraa, Kashiwagib, Kashiwagic & Al-Tassand, 2016; Durdyev et al., 2017; Zidane, Johansenb & Ekambaramb, 2015; Elawi, 2016; Doloi, Sawhney & Iyer, 2012; Gunduz & AbuHassan, 2016; Gluszak & Lesniak, 2015; Gunduz, Nielsen & Ozdemir, 2015). The selected five delay factors are:

(1) Change scope, design and specifications,

(2) Material problem (supply vs availability),

(3) Financial difficulties (cash flow, currency),

(4) Poor productivity/ non-availability of Labor, and

(5) Poor communication and coordination among parties.

2.2 Critical Success Factors Review

Around the world, many researchers have been inspired to investigate project critical success factors. Toor and Ogunlana (2009) attempted to extract the understanding of construction experts on critical success factors (CSFs) pertained to construction projects of large-scale size in Thailand. Their study revealed that most of the high-rated CSFs are related to project planning and control, personnel, and involvement of client. However, the top ten CSFs according to the study were ranked as follows: effective project planning and control, sufficient resources, clear and detailed written contract, clearly defined goals and priorities of all stakeholders, competent project manager, adequate communication among related parties, competent team members, Knowing what client really wants, responsiveness of client and awarding bids to the right designers/contractors.

Tabish and Jha (2012) investigated important factors for success of construction projects pertains to public sector in India, the success factors resulted from this study were categorized into generic and specific natures, findings for generic type were: owners requirements need thorough understanding and precise definition, a high level of trust among the project bodies participants, on time and helpful decision from higher management, availability of all required resources as planned during all execution phases of project, top management's support, and consistent monitoring and feedback by higher management, while success factors of particular character were: thorough understanding of project manager and contractor on their part scope, comprehensive and thorough investigation of the project site in the pretender stage, regular and periodic monitoring and feedback by the owner representative, avoid bureaucratic interference, absent of social and political interferences , well identified and clear threaded scope of work, quality control and quality assurance activities, and adequate communication among all project participants. Mustaffa and Yong (2013) evaluated the severity-identified factors on construction project success distributed to clients, consultants and contractors. Their study identified fifteen (15) factors to be accepted as a critical to the success of construction projects and suggested a strong consistency in perception between respondents in recognizing the significance of human-related factors such as competence, commitment, communication and cooperation towards the success of a construction project. Thi and Swierczek (2010) have also studied causes of CSFs in Vietnam construction projects and their study revealed that manager competencies, member competencies and external stability have important positive relationships to the success criteria.

Gudienė, Banaitis, Podvezko & Banaitienėet (2014) conducted an empirical study in Lithuania to evaluate critical success factors for construction projects, based on the study results, ten factors including project manager competence, project management team members' competence, project manager coordinating skills, client clear and precise goals/objectives, project value, project management team members' relevant past experience, project manager organizing skills, project manager effective and timely conflict resolution, client ability to make timely decision, and project manager experience were determined as the most significant success factors for Lithuanian construction projects.

Several researchers have pointed out various findings about critical success factor in construction projects such as Gunduz and Yahya (2015) conducting a study aimed to determine the critical success factors in the construction industry in Middle East region and in the United Arab Emirates market specially. These factors were evaluated for their influence and contribution to the real performance of the project from the perspective of three criteria: schedule, cost, and quality. Mukhtar, Amirudin, Sofield & Mohamad (2016) investigated success factors in public housing projects in Nigeria and serves as a guide reference to housing policy makers. The study identified seven CSFs for public housing projects in Nigeria, these factors are; availability of competent personnel, effective project management, proper design and appropriate location, powerful financing system for housing, and sufficient political support.

A number of studies were conducted to identify the project critical success factors. Some studies investigated the impact of technical factors such as scope and work definition as well as planning. Other body of research studied the effect that different stakeholders may have on the project outcome; i.e. commitment, team capabilities, project manager capabilities and commitment (Mustaffa & Yong, 2013; Babu, 2015; Cserháti & Szabó, 2014). Some researchers studied the project management techniques and the effect of team members, team motivation and personnel selection and training (Banihashemi, Hosseini, Golizadeh & Sankaran, 2017; Amade, Ubani, Omajeh & Njoku, 2015; Gunduz & Yahya, 2015; Zou, Kumaraswamy, Chung & Wong, 2014; Wibowo & Alfen, 2014). Others investigated the impact of so skills such as communication between different stakeholders, or external factors that might affect the project success, such as political conflict and corruption, rough climate characters and environment, unexpected conditions (Babu, 2015; Zavadskas, Vilutiene, Turskis & Saparauskas, 2014; Ihuah, Tippett & Eaton, 2014; Shehu, Endut, Akintoye and Holt, 2014; Marzouk & El-Rasas, 2014;

Wibowo and Alfen, 2014; Gudienė, Banaitisa, Banaitienėa & Lopesb, 2013; Yong & Mustaffa, 2013; Gudienė et al., 2014).

Based on an analysis of the literature that has been outlined earlier, it has become apparent that there is a plenty of factors with the potential to influence the project success. However, according to Altarawneh, Thiruchelvam & Samadi (2017), due to their frequent use in previous studies and because much researches were concluded their studies results by them in some way, the six most significant success factors in determining project success identified by various number of researchers and their attributes have been chosen for further investigation in this study are listed in Table 1.

Table 1. Critical Success Factors (CSFs) and their attributes

Group/Construct	*Item*	Item Description
Project Management Process (PMP)	PMP1	Detailed engineering plans and all drawings are timely finalized
	PMP2	Contractual motivation/incentives clause exists for early
	PMP3	Thorough prequalification for bidders
	PMP4	Scope of work was clearly articulated
	PMP5	Comprehensive pretender site investigation carried out
Project Manager's Competency (PMC)	PMC1	Project Manager (PM) are selected early with proven track record
	PMC2	PM have similar project experience
	PMC3	PM have coordinating ability and rapport with owner, contractor,
	PMC4	There is a thorough understanding of scope between PM and
	PMC5	PM displayed a sense of power and confidences in decisions
Project Team's member Competency	PTC1	Project Team Member (PTM) competences such as knowledge,
	PTC2	PTM have the sufficient knowledge to make various quick
	PTC3	There is adequate communication among PTMs
	PTC4	Conflict is resolved quickly by PTMs
	PTC5	PTM has the aptitude to take an active part in the monitoring and
Project Organizational Planning (POP)	POP1	Timely valuable decisions are received from top management
	POP2	PM for the project and staff had given timely valuable decisions
	POP3	Design and construction control meetings are conducted
	POP4	Regular schedule and budget updates are taken
	POP5	Adequate staff is available for planning
Project Resources' Utilization (PRU)	PRU1	Contractor utilized up-to-date technology
	PRU2	Regular quality control and quality assurance activities are
	PRU3	Resources are available (fund, machinery, material etc,) as planned
	PRU4	Adequate staff are available for execution
	PRU5	The pre-qualification of the consultant and/or bidder are done
Project Orginisational Commitment (POC)	POC1	Owner is committed to release payments within 45 days of
	POC2	PM is committed against goals/objectives set to meet project
	POC3	PM is committed to project compliance in accordance to owner's
	POC4	PTMs are committed to zero accident achievement during
	POC5	Contractor is committed to zero variation orders

2.3 Moderator Factors Review

In addition to the critical success factors that have been identified in the literature, the impact of two other moderate factors has been investigated, Project Benchmark Characteristics (PBC) and Project External Environments (PEE), which are believed to affect the relationship between the critical success factors and project critical delays (Park, 2009; Tan & Ghazali, 2011; Yang, Huang & Wu, 2011; LI, Arditi & Wang, 2012; Gudienė et al., 2013; Yong & Mustaffa, 2013; Gudienė et al., 2014). In the available literature, project Benchmark characteristics and project external environments have long been disregarded as being critical success factors; however, many construction projects witnessed status of failure due to problems within projects (Thi and Swierczek, 2010).

Several researchers underpin 'environment' factors influencing the construction project success (Ahsan & Gunawan, 2010; Tan and Ghazali, 2011; Zawawi, Kamaruzzaman, Ithnin & Zulkarnain,, 2011; Windapo and Cattell, 2013; Gudienė et al., 2013; Gudienė et al., 2014; Ihuah et al., 2014; Shehu et al., 2014; Marzouk & El-Rasas, 2014; Wibowo and Alfen, 2014). Further, Jin, Tan, Zuo and Feng (2012) described 'environment' as all external issues effects on the construction project process, including and not limited to social, political, and technical systems. The factors that can be grouped into these categories include economic environment, social environment, political environment, physical environment, industrial relation environment, and level of technology advanced (Jin et al., 2012).

This external environmental factor contains several items, which are external to the project but have an influence on the construction project performance, either positively or negatively (Thi and Swierczek, 2010). A number of external environmental factors, such as economic, political, legal, social and those factors linked to new technologies or even factors related to nature, may influence construction project performance (Hwang, Zhao & Ng, 2013). However, according to Jin et al. (2012), some of these externals influence the construction project at all phases of the project life cycle, such as weather conditions or the social environment. According to some researchers, these factors sometimes, have a considerable impact that they resulted in project termination at the construction stage (Jin et al., 2012; Yong and Mustaffa, 2013; Zhao et al., 2013; Gudienė et al., 2014).

According to several researchers, project size, value, uniqueness of project activities, the density of project and project urgency were specified as major critical success factors within the project (Ng, Wong & Wong, 2012; Gudienė et al., 2013; Zhao et al., 2013; Gudienė et al., 2014; Yang et al., 2015; Shehu et al., 2014; LI et al., 2012; Yong & Mustaffa, 2013; Tan & Ghazali, 2011). In addition to that, Gudienė et al (2014) pointed out that several large construction projects that contain more than 100 activities exceed their contractual deadlines. Also, several researchers highlighted that; the project manager's performance in the work can be significantly affected by the uniqueness of the construction activities (LI et al., 2012; Gudienė et al., 2013; Yong & Mustaffa, 2013; Gudienė et al., 2014). They believed that, it is easier for project managers to plan, schedule and monitor construction project activities if a project has tasks that are more standard rather than complex activities. According to them, Project density also affects the overall performance. That is, will influence the allocation of project resources, including man-hours and machineries. In a way, due to imposed resource constraints, project managers are often constrained to implement overtime procedures, which lead to exceed the allocated budget, or they are strained to delay activities running for the same manpower resources, which cause delays in project completion. Some researchers related urgency to project success (Gudienė et al., 2014). On the other hand, project performance criteria for some cases are not met due to the urgency impact (Yang et al., 2011; LI et al., 2012). From the presented literature review and many previous several researches, two moderator factors were identified in several studies and listed with their attributes in Table 2.

Table 2. Moderator factors and their attributes

Group/Construct	*Item*	Item Description
Project Benchmark Characteristics (PBC)	PBC1	High value of project
	PBC2	Large size of project (team numbers involved and number of
	PBC3	Complexity and uniqueness of project activities
	PBC4	The urgency of project outcome
	PBC5	The type of project (new, existing, maintenance)
Project External Environments (PEE)	PEE1	Physical environment problems like (location, soil works,
	PEE2	Natural climates problems like winds, rains, high humidity and
	PEE3	Social and cultural interference (population demographics, rising
	PEE4	Economic and financial problems (price, local currency value,etc.)
	PEE5	Bureaucratic interference

3. Research Hypothesis

Following the conduct of thorough and intensive literature review, codes and description of the research hypotheses are represented in Table 3.

Table 3. Research Hypotheses Codes and Descriptions

Code	*Description*	Path
Direct Effect of Constructs		
H1	Project Management Process (PMP) has a positive effect on Critical Delay Factor Evaluation (CDFS)	PMP → CDFS
H2	Project Manager's Competency (PMC) has a positive effect on Critical Delay Factor Evaluation (CDFS)	PMC → CDFS
H3	Project Team's member Competency (PTC) has a positive effect on Critical Delay Factor Evaluation (CDFS)	PTC → CDFS
H4	Project Organizational Planning (POP) has a positive effect on Critical Delay Factor Evaluation (CDFS)	POP → CDFS
H5	Project Resources' Utilization (PRU) has a positive effect on Critical Delay Factor Evaluation (CDFS)	PRU → CDFS
H6	Project Organizational Commitment (POC) has a positive effect on Critical Delay Factor Evaluation (CDFS)	POC → CDFS
Moderation Effects of Project Benchmark Characteristics (PBC)		
H7a	Project Benchmark Characteristics (PBC) moderates the relationship between Project Management Process (PMP) and Critical Delay Factor Evaluation (CDFS)	(PMP*PBC) → CDFS
H7b	Project Benchmark Characteristics (PBC) moderates the relationship between Project Manager's Competency (PMC) and Critical Delay Factor Evaluation (CDFS)	(PMC*PBC) → CDFS
H7c	Project Benchmark Characteristics (PBC) moderates the relationship between Project Team's member Competency (PTC) and Critical Delay Factor Evaluation (CDFS)	(PTC*PBC) → CDFS
H7d	Project Benchmark Characteristics (PBC) moderates the relationship between Project Organizational Planning (POP) and Critical Delay Factor Evaluation (CDFS)	(POP*PBC) → CDFS
H7e	Project Benchmark Characteristics (PBC) moderates the relationship between Project Resources' Utilization (PRU) and Critical Delay Factor Evaluation (CDFS)	(PRU*PBC) → CDFS
H7f	Project Benchmark Characteristics (PBC) moderates the relationship between Project Organizational Commitment (POC) and Critical Delay Factor Evaluation (CDFS)	(POC*PBC) → CDFS
Moderation Effects of Project External Environments (PEE)		
H8a	Project Benchmark Characteristics (PBC) moderates the relationship between Project Management Process (PMP) and Critical Delay Factor Evaluation (CDFS)	(PMP*PEE) → CDFS
H8b	Project Benchmark Characteristics (PBC) moderates the relationship between Project Manager's Competency (PMC) and Critical Delay Factor Evaluation (CDFS)	(PMC*PEE) → CDFS
H8c	Project Benchmark Characteristics (PBC) moderates the relationship between Project Team's member Competency (PTC) and Critical Delay Factor Evaluation (CDFS)	(PTC*PEE) → CDFS
H8d	Project Benchmark Characteristics (PBC) moderates the relationship between Project Organizational Planning (POP) and Critical Delay Factor Evaluation (CDFS)	(POP*PEE) → CDFS
H8e	Project Benchmark Characteristics (PBC) moderates the relationship Project Resources' Utilization (PRU) and Critical Delay Factor Evaluation (CDFS)	(PRU*PEE) → CDFS
H8f	Project Benchmark Characteristics (PBC) moderates the relationship Project Organizational Commitment (POC) and Critical Delay Factor Evaluation (CDFS)	(POC*PEE) → CDFS

4. Research Model

In order to specify the research hypotheses targeted in Table 3, a research structural model was developed in this study. The research structural model is intended to test 6 hypotheses related to direct effects from (PMP), (PMC), (PTC), (POP), (PRU) and (POC) on Critical Delay Factor Evaluation (CDFS).The study also examined the moderation effects of (PBC) and (PEE) on the relationships of the other constructs. Figure 1 illustrates the hypothesized direct and moderation effects in the research structural model.

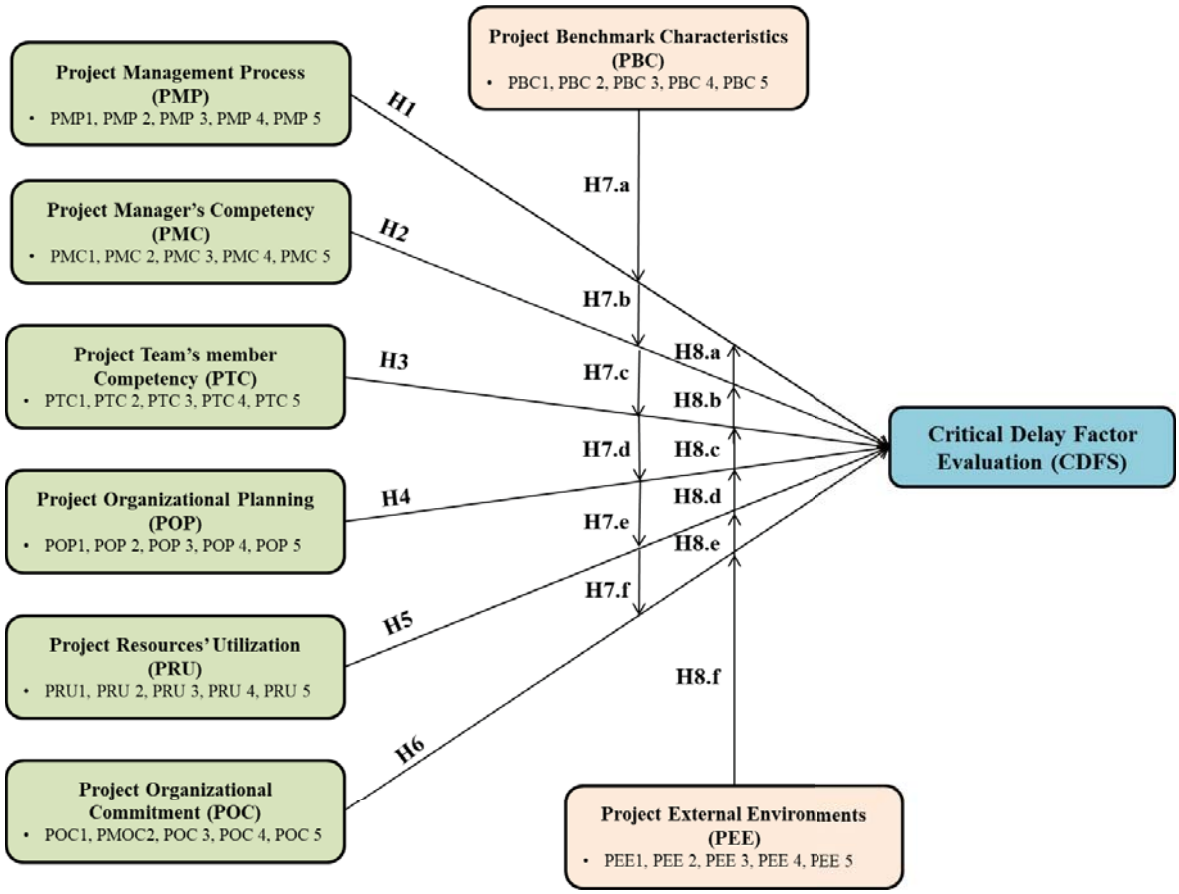

Figure 1. Hypothetical model

The factors are known as exogenous latent variables meanwhile the items are known as relative manifest variables. The details of the exogenous latent and relative manifest variables of the adopted model are shown in Table 1 &2.

5. Research Method

This study followed quantitative research approach including data collection by means of structured questionnaire survey. The survey was conducted between main owners of water projects, qualified consultants and contractors registered in the vender's list of the main owners who are either handle or conduct all released projects for the last ten years. A total number of 450 questionnaires were released between the selected companies (owners, consultant & contractors). As a result, 323 completed questionnaires were returned back by the participants. The collected questionnaires were analysed using SPSS software for evaluate the received questionnaires against the demographic information of the respondents as summarized in Table 4.

Table 4. Demographic information of respondents

Group	*Frequency*	Percentage
Experience		
5-12 years	94	29.1
13-20 years	166	51.4
More than 20 years	63	19.5
Age		
21-30 years	33	10.2
31-40 years	105	32.5
41-50 years	119	36.8
51-60 years	44	13.6
Above 61 years	22	6.8
Area		
Construction Management	51	15.8
Architectural	20	6.2
Civil & Structure (C&S)	128	39.6
Mechanical & Electrical (M&E)	105	32.5
Quantity Surveyor (QS)	19	5.9
Role		
Client/Owner	114	35.3
Consultant/Engineering	39	12.1
Contractor	170	52.6
Education		
Diploma	18	5.6
Bachelor degree	242	74.9
Master degree	52	16.1
Ph.D.	11	3.4

6. Overall CFA Model

As highlighted earlier, structural equation, modelling is a data analytic technique commonly used to examine patterns of relationships among constructs (Cooper & Schindler, 2006). The latent constructs in individual CFA models were all measured by several multi-item scales. The inclusion of all items and relative errors in the measurement and structural models leads to a complex and non-stable model because too many parameters need to be estimated. Thus, to overcome this problem, this research utilised parcels as indicators of latent constructs in individual CFA models. Parcels are aggregations (sums or averages) of several individual items. Using parcels as indicators of latent construct commonly have better reliability as compared with the single items (Coffman & MacCallum, 2005). As the result of using item-parcelling procedure, the latent constructs in individual CFA models of (PMP), (PMC), (PTC), (POP), (PRU), (POC), (PBC) and (PEE) were converted into observed variables so that they could easily construct the overall measurement and structural model and reduce the model complexity.

Confirmatory factor analysis was used to assess the overall measurement model. The model comprises all of the first and second order constructs proposed in this study. Figure 2 depicts the overall CFA model.

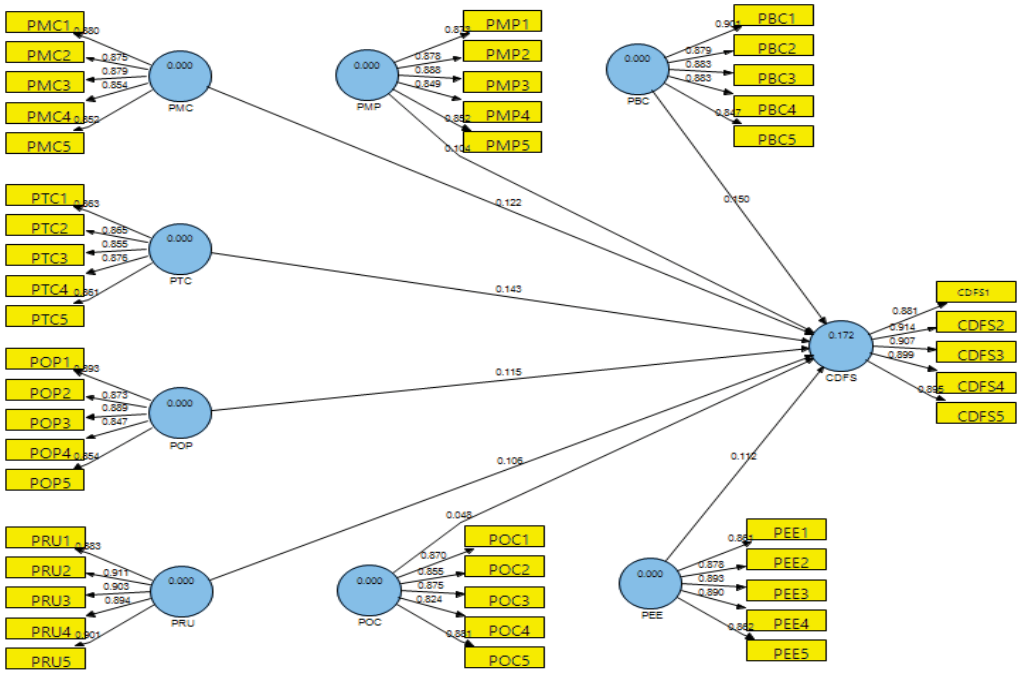

Figure 2. Overall CFA Model

6.1 Reliability and Convergent Validity

Table 5 represents the result of Cronbach alpha and convergent validity for the Overall CFA model.

Table 5. Results of Cronbach Alpha and Convergent Validity for Overall CFA Model

Construct	*Item*	Factor	Average Variance	Composite Reliability	Internal
Project Management Process (PMP)	PMP1	0.873	0.754	0.939	0.919
	PMP2	0.878			
	PMP3	0.888			
	PMP4	0.849			
	PMP5	0.852			
Project Manager's Competency (PMC)	PMC1	0.880	0.754	0.939	0.919
	PMC2	0.875			
	PMC3	0.879			
	PMC4	0.854			
	PMC5	0.852			
Project Team's member Competency (PTC)	PTC1	0.863	0.746	0.936	0.915
	PTC2	0.865			
	PTC3	0.855			
	PTC4	0.876			
	PTC5	0.861			
Project Organizational Planning (POP)	POP1	0.893	0.759	0.940	0.921
	POP2	0.873			
	POP3	0.889			
	POP4	0.847			
	POP5	0.854			
Project Resources' Utilization (PRU)	PRU1	0.883	0.807	0.954	0.941
	PRU2	0.911			
	PRU3	0.903			
	PRU4	0.894			
	PRU5	0.901			
Project Organizational Commitment (POC)	POC1	0.870	0.742	0.935	0.914
	POC2	0.855			
	POC3	0.875			
	POC4	0.824			
	POC5	0.881			
Project Benchmark Characteristics (PBC)	PBC1	0.901	0.773	0.944	0.926
	PBC2	0.879			
	PBC3	0.884			
	PBC4	0.883			
	PBC5	0.847			
Project External Environments (PEE)	PEE1	0.861	0.769	0.943	0.925
	PEE2	0.878			
	PEE3	0.893			
	PEE4	0.890			
	PEE5	0.862			
Critical Delay Factor Evaluation (CDFS)	CDFS1	0.881	0.809	0.955	0.941
	CDFS2	0.914			
	CDFS3	0.907			
	CDFS4	0.899			
	CDFS5	0.895			

[a]: Average Variance Extracted = (summation of the square of the factor loadings)/{(summation of the square of the factor loadings) + (summation of the error variances)}.

[b]: Composite reliability = (square of the summation of the factor loadings)/{(square of the summation of the factor loadings) + (square of the summation of the error variances)}.

As shown in Table 5, the results of assessing the standardized factor loadings of the model's items indicated that the initial standardised factor loadings of items were all above 0.6, ranged from 0.824 to 0.914.

Once the uni-dimensionality of the constructs was achieved, each of the constructs was assessed for their reliability. Reliability is assessed using average variance extracted (AVE), construct reliability (CR) and

Cronbach's alpha. Table 5 shows that the AVE values were 0.754, 0.754, 0.746, 0.759, 0.807, 0.742, 0.773, 0.769 and 0.809 for (PMP), (PMC), (PTC), (POP), (PRU), (POC), (PBC), (PEE) and Critical Delay Factor Evaluation (CDFS) respectively. All of these values were above the cut-off 0.5 as suggested by Hair et al. (2006).

The composite reliability values were 0.939, 0.939, 0.936, 0.940, 0.954, 0.935, 0.944, 0.943 and 0.955 for (PMP), (PMC), (PTC), (POP), (PRU), (POC), (PBC), (PEE) and (CDFS) respectively. These values exceeded the recommended value of 0.6 for all constructs as recommended by Bagozzi and Yi (1988).

The Cronbach's Alpha values were 0.919, 0.919, 0.915, 0.921, 0.941, 0.914, 0.926, 0.925 and 0.941 for (PMP), (PMC), (PTC), (POP), (PRU), (POC), (PBC), (PEE) and Critical Delay Factor Evaluation (CDFS) respectively. These values were all above the threshold of 0.7 as suggested by Nunnally and Bernstein (1994).

6.2 Discriminant Validity

Table 6 represents the discriminant validity of the Overall CFA Model.

Table 6. Discriminant validity of Overall CFA Model

	PMP	PMC	PTC	POP	PRU	POC	PBC	PEE	CDFS
PMP	**0.868**								
PMC	0.063	**0.868**							
PTC	0.115	0.056	**0.864**						
POP	0.067	0.012	0.138	**0.871**					
PRU	0.227	0.135	0.067	0.129	**0.898**				
POC	0.079	-0.074	0.046	0.043	0.096	**0.861**			
PBC	0.120	0.083	-0.018	0.097	0.043	0.096	**0.879**		
PEE	0.054	0.034	0.083	0.177	0.087	0.131	0.283	**0.877**	
CDFS	0.188	0.165	0.193	0.193	0.192	0.098	0.222	0.212	**0.899**

Note: Diagonals represent the square root of the average variance extracted while the other entries represent the square correlations.

The inter-correlations between the 9 sub-constructs in Overall CFA Model ranged from -0.074 to 0.283, which were below the threshold 0.85 as recommended by Kline (2005). Further, as shown in Table 20 4, the correlations were less than the square root of the average variance extracted by the indicators, demonstrating good discriminant validity between these factors (Kline, 2005). Upon examining goodness to fit of data, convergent validity and discriminant validity of the measurement model, it can be concluded that modified measurement scale to assess the constructs and their relative items in overall measurement model was reliable and valid.

7. Structural Models

The structural equation model is considered as the second major process of structural equation modeling analysis. Once validation process of the measurement model is confirmed, then representation of the structural model can be established by identifying the relationships between the constructs. The structural model provides details on the links between the variables (Nafisi, A. & Nafisi, S., 2015). It displays the particular details of the relationship among the independent or exogenous and dependent or endogenous variables (Hair, et al., 2006; Ho, 2006). Evaluation of the structural model spotlight firstly on the overall model fit, followed by the size, direction and significance of the hypothesized parameter estimates, as shown by the one- headed arrows in the path diagrams (Hair, et al., 2006). The final part included the confirmation process of the structural model of the study, which was established on the projected relationship among the identified and assessed variables. In the present study, the structural model was supposed to test the research hypothesizes, utilizing PLS method and bootstrapping with 1000 replications.

The next sub-sections discuss the development of structural model to test the research hypotheses described in Table 3.

7.1 Direct Effects of Constructs

In the structural model, the direct causal effects of (PMP), (PMC), (PTC), Project Organizational Planning (POP), (PRU) and (POC) on Critical Delay Factor Evaluation (CDFS) were examined. These effects refer to the 6 hypotheses namely: H1, H2, H3, H4, H5 and H6 respectively. The Smart-PLS model is portrayed in in Figure 3.

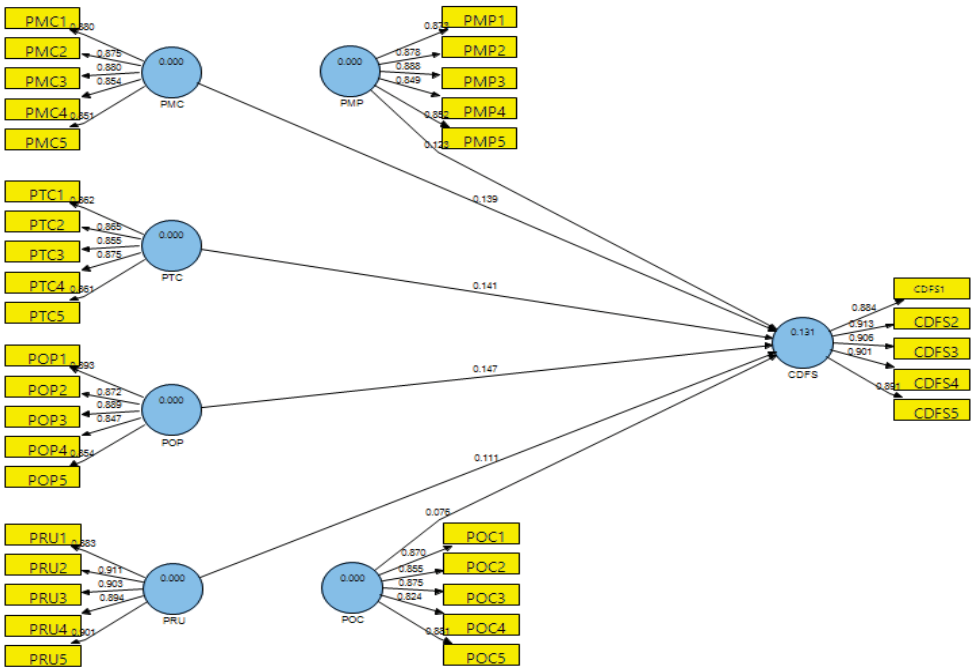

Figure 3. PLS Analysis of the Structural Model for Direct Effects

The value of R2 for Critical Delay Factor Evaluation (CDFS) was 0.172. This indicates, 17 percent of variations in Critical Delay Factor Evaluation (CDFS) are explained by its 6 predictors (i.e, (PMP), (PMC), (PTC), (POP (PRU) and (POC)). Overall findings showed that the R^2 value satisfies the requirement for the 0.30 cut off value as recommended by Patterson (2013). The values of Q2 for Critical Delay Factor Evaluation (CDFS) was 0.129, far greater than zero, which refers to predictive relevance of the model as suggested by Chin (2010). In sum, the model exhibits acceptable fit and high predictive relevance.

The coefficient parameters estimates are then examined to test the hypothesized direct effects of the variables, which were addressed in Table 3. The path coefficients and the results of examining hypothesized direct effects are displayed in Table 7.

Table 7. Examining Results of Hypothesized Direct Effects of the Constructs

Path Shape	*Path Coefficient*	Standard Error	T-value	P-value	Hypothesis Result
PMP → CDFS	0.123***	0.028	4.361	0.000	H1) Supported
PMC → CDFS	0.139***	0.025	5.541	0.000	H2) Supported
PTC → CDFS	0.141***	0.026	5.348	0.000	H3) Supported
POP → CDFS	0.147***	0.023	6.496	0.000	H4) Supported
PRU → CDFS	0.111***	0.025	4.351	0.000	H5) Supported
POC → CDFS	0.076*	0.033	2.266	0.024	H6) Supported

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

As shown in Table 7, all paths from (PMP), (PMC), (PTC), (POP), (PRU) and (POC) to Critical Delay Factor Evaluation (CDFS) were statistically significant as their p-values were all below the standard significance level of 0.05. Thus, the hypotheses H1, H2, H3, H4, H5 and H6 were supported.

7.2 Moderation Effects of Project Benchmark Characteristics (PBC)

The Smart-PLS model with interaction terms to examine the moderation effects of Project Benchmark Characteristics (PBC) is portrayed in Figure 4.

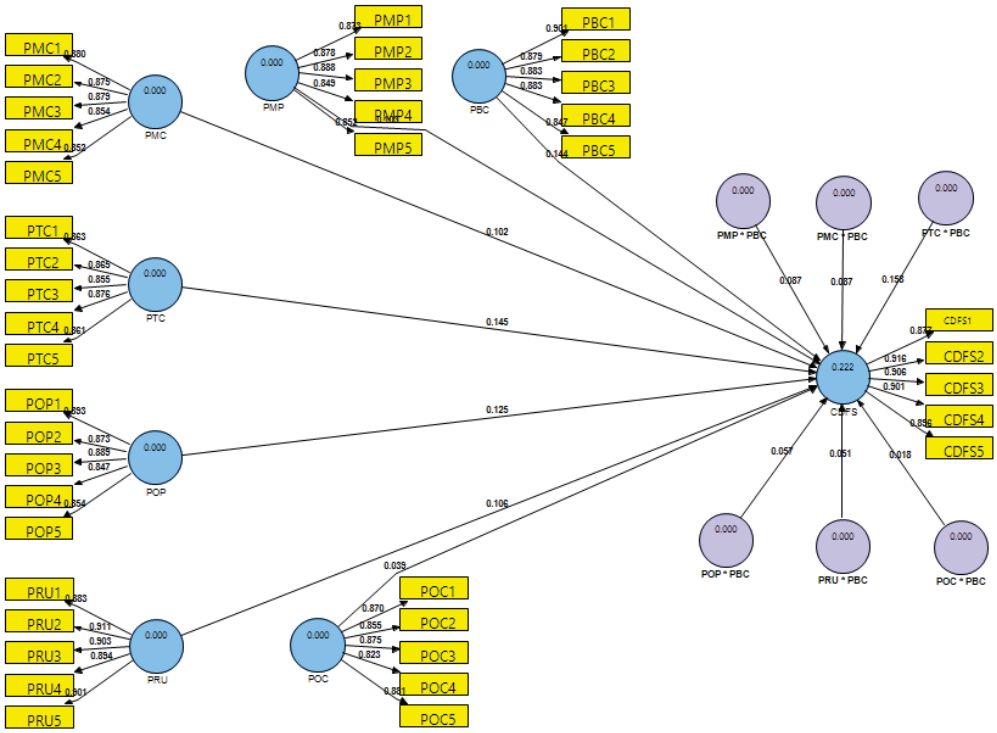

Figure 4. PLS Analysis of the Structural Model for Moderation Effects of Project Benchmark Characteristics (PBC)

The values of R2 for Critical Delay Factor Evaluation (CDFS) was 0.222, above the threshold of 0.1 as recommended by Patterson 2013. The values of Q2 for Critical Delay Factor Evaluation (CDFS) was 0.166, far greater than zero, which refers to predictive relevance of the model as suggested by Chin 2010. In sum, the model exhibits acceptable fit and high predictive relevance.

The moderation (PBC) on the effects of (PMP), (PMC), (PTC), (POP), (PRU) and (POC) as independent variables on Critical Delay Factor Evaluation (CDFS) as dependent variable (DV) were examined as presented in Table 8. Further, the path coefficient was used to evaluate the contribution of each interaction term on the DVs.

Table 8. Moderation Effects of Project Benchmark Characteristics (PBC)

Path Shape	*Path*	Standard Error	T-value	P-value	Hypothesis Result
(PMP*PBC) → CDFS	0.087**	0.025	3.453	0.001	H7a) Supported
(PMC*PBC) → CDFS	0.087***	0.021	4.171	0.000	H7b) Supported
(PTC*PBC) → CDFS	0.158***	0.025	6.412	0.000	H7c) Supported
(POP*PBC) → CDFS	0.057*	0.026	2.224	0.027	H7d) Supported
(PRU*PBC) → CDFS	0.051	0.030	1.669	0.096	H7e) Rejected
(POC*PBC) → CDFS	0.018	0.034	0.521	0.603	H7f) Rejected

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

As shown in Table 8, the interaction terms of (PBC) with (PMP), (PMC) and (PTC) and (POP) had significant effects on Critical Delay Factor Evaluation (CDFS) as their p-values were all lower than the standard significance level of 0.05. These results demonstrated that (PBC) moderates the effects of (PMP), (PMC), (PTC) and (POP) on Critical Delay Factor Evaluation (CDFS). Therefore, hypotheses H7a, H7b, H7c and H7d were supported.

Conversely, the interaction terms of (PBC) with (PRU) and (POC) had not any significant effects on Critical Delay Factor Evaluation (CDFS) as their p-values exceeded the standard significance level of 0.05. This result demonstrated that (PBC) could not moderate the effects of (PRU) and (POC) on Critical Delay Factor Evaluation (CDFS). Therefore, hypotheses H7e and H7f were rejected.

7.3 Moderation Effects of Project External Environments (PEE)

The Smart-PLS model with interaction terms to examine the moderation effects of Project External Environments (PEE) is portrayed in Figure 5.

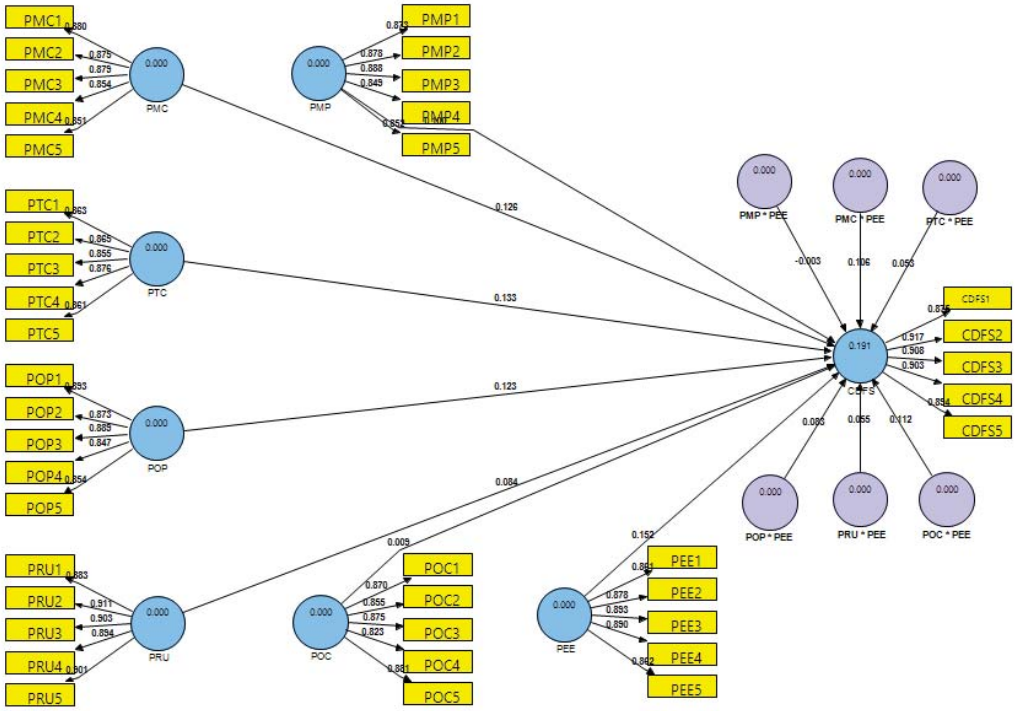

Figure 5. PLS Analysis of the Structural Model for Moderation Effects of Project External Environments (PEE)

The value of R2 for Critical Delay Factor Evaluation (CDFS) was 0.191, above the threshold of 0.1 as recommended by Patterson (2013). The values of Q2 for Critical Delay Factor Evaluation (CDFS) was 0.141, far greater than zero, which refers to predictive relevance of the model as suggested by Chin 2010. In sum, the model exhibits acceptable fit and high predictive relevance. The moderation effects of (PEE) on the effects of (PMP), (PMC), (PTC), (POP), (PRU) and (POC) as independent variables on Critical Delay Factor Evaluation (CDFS) as dependent variable (DV) were examined as presented in Table 9. Further, the path coefficient was used to evaluate the contribution of each interaction term on the DVs.

Table 9. Moderation Effects of Project External Environments (PEE)

Path Shape	*Path* Coefficient	Standard Error	T-value	P-value	Hypothesis Result
(PMP*PEE) → CDFS	-0.003	0.035	0.091	**0.927**	H8a) Rejected
(PMC*PEE) → CDFS	0.106*	0.045	2.375	**0.018**	H8b) Supported
(PTC*PEE) → CDFS	0.053	0.034	1.553	**0.121**	H8c) Rejected
(POP*PEE) → CDFS	0.083**	0.030	2.765	**0.006**	H8d) Supported
(PRU*PEE) → CDFS	0.055*	0.027	2.065	**0.040**	H8e) Supported
(POC*PEE) → CDFS	0.112**	0.035	3.237	**0.001**	H8f) Supported

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

As shown in Table 9, the interaction terms of (PEE) with (PMC), (POP), (PRU) and (POC) had significant effects on Critical Delay Factor Evaluation (CDFS) as their p-values were all lower than the standard significance level of 0.05. These results demonstrated that (PEE) moderates the effects of (PMC), (POP), (PRU) and (POC) on Critical Delay Factor Evaluation (CDFS). Therefore, hypotheses H8b, H8d, H8e and H8f were supported.

Conversely, the interaction terms of (PEE) with (PMP) and (PTC) had not any significant effects on Critical Delay Factor Evaluation (CDFS) as their p-values exceeded the standard significance level of 0.05. This result demonstrated that (PEE) could not moderate the effects of (PMP) and (PTC) on Critical Delay Factor Evaluation (CDFS). Therefore, hypotheses H8a and H8c were rejected.

9. Conclusion

Structural model was developed to examine 6 hypothesized direct effects and 12 hypothesized moderation effects of Benchmark Characteristics (PBC) and Project External Environments (PEE). These were done by

conducting the path analysis using SMART-PLS 2.0 and testing the significant of the path coefficients for each hypothesized path.

The results indicated that Project Management Process (PMP), Project Manager's Competency (PMC), Project Team's member Competency (PTC), Project Organizational Planning (POP), Project Resources' Utilization (PRU) and Project Organizational Commitment (POC) had significant positive effects on Critical Delay Factor Evaluation (CDFS). The results also indicated that Project Organizational Planning (POP) is the most significant predictor of Critical Delay Factor Evaluation (CDFS), followed by Project Team's member Competency (PTC) and Project Manager's Competency (PMC).

From the results of moderation analysis, it was found that Project Benchmark Characteristics (PBC) positively moderate the effects of Project Management Process (PMP), Project Manager's Competency (PMC) and Project Team's member Competency (PTC) and Project Organizational Planning (POP) on Critical Delay Factor Evaluation (CDFS).

The results also showed that Project External Environments (PEE) positively moderates the effects of Project Manager's Competency (PMC), Project Organizational Planning (POP) and Project Resources' Utilization (PRU) on Critical Delay Factor Evaluation (CDFS). While the effect of Project Organizational Commitment (POC) on Critical Delay Factor Evaluation (CDFS) was inversely moderated by Project External Environments (PEE).

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Antecedents of Successful IT M&As

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Abstract

In this paper, I examine the antecedents of successful IT M&As. Drawing from several theories from strategic management, I propose several hypotheses about the impact of acquiring firm's environmental uncertainty, pairwise technology complementarity, product market proximity, and the acquiring firm's CEO narcissism on combined firm's post-M&A performance measured by profitability and innovation capability. Empirical results partially support my hypotheses: I find that technological complementarity is positively correlated with both post-merger profitability and innovation capability. CEO narcissism, on the hand, only impacts the profitability measure and there is an inversed U-shape relationship. I also find the positive interaction effect between CEO narcissism and technological complementarity on profitability.

Keywords: M&A, environmental uncertainty, product market proximity, technological complementarity, CEO narcissism, post-M&A performance

1. Introduction

Merger and Acquisition (M&A) has been an extensively studied phenomenon in economics, finance, accounting, and strategic management in the past several decades. Early empirical studies by financial economists typically suggest that M&A did not enhance acquiring firm's value (Haleblian et al., 2009) as measured mostly by short term performance measure of market reaction. Alternative performance measures such as longer-term accounting-based and non-financial performance measures were also used, and findings have been mixed. In the recent decade, more attention has been put to the study of motivation of M&A and the antecedents of successful M&As using a variety of performance measures. Even though M&A is not a new topic, little attention has been focused on M&As among IT industry. Over the past 15 years, the technology industry has experienced a high volume of M&A activity. In fact, technology M&A has exceeded any other industry, largely fueled by a constant demand for innovation and a decade-long period of consolidation (PwC – US Technology M&A Insights). Therefore, it is important and valuable to completely understand the motivations and outcomes of IT M&As in a rigorous research design. More importantly, the context specific variables might provide new insights and findings that are different from what we know about M&A in the existing literature. Therefore, in this study, I intend to examine M&As among information technology (IT) industry. Specifically, I plan to study the following research questions: What are the antecedents of successful IT M&As?

The alternation of IT firm boundaries can be explained by economic theories including transaction cost economics (TCE), strategic management theory on complementarities. Moreover, upper echelon theory suggests that CEO has the determining power in those M&A decisions, and I am also interested in the question of how CEO's narcissistic behavior or overconfidence may play a role in M&A performance. I am interested in studying M&A performance hypotheses built based on those theories. Specifically, I study the associations between firms' post-M&A performance with (1) environmental uncertainty, (2) technological complementarity between acquiring and targeted firm, (3) product market proximity between acquiring and targeted firm, and (4) direct effect of CEO narcissism and its interaction effects with above relationships. I think this study will at least make three contributions: (1) Even though there has been significant amount of studies on M&A performance in finance, strategic management literature, most of them consider characteristics of the acquiring firm, relatedness of acquiring and target firms, and deal level covariates, this study will be the first one which examines how the acquiring firms' environmental antecedents impact post-merger performance. Previous studies argue that firms operate in uncertain environment are more likely to vertically integrate rather than acquiring inputs and services from the market to avoid high transaction cost of using market exchanges. Therefore, I argue that if there is a "fit" between firm's environmental characteristics and its governance mechanism, the mechanism should be more

effective. (2) Also, although the context of many M&A researches is high tech industry such as pharmaceutical and biotechnology, almost none of them studies the M&As exclusively on IT firms. As IT advances in the past two decades, there are increasing numbers of high tech firms start and will remain relying on IT for purposes of product/service innovation and/or efficiency improvement. Thus, it is increasingly important and valuable to study the determinants of success acquisitions of IT firms for those high-tech firms who want to vertically integrate some of their IT functionalities, either for efficiency enhancement or increased innovativeness in product market. Focusing just on IT M&A might yield some different findings and interesting insights that are unique to IT M&As. (3) In addition to those main predictors, this study is almost the first one which investigates the effect of psychological trait of firm's CEO on M&A performance.

The rest of the paper is structured like this: section 2 discusses the hypotheses development and theories behind them. In section 3, I will discuss the empirical method including sampling, variable definitions and econometrics models. Section 4 presents empirical results and their implications. The paper is concluded in section 5 with the discussion of contribution and managerial implications.

2. Hypotheses Development

The alternation of IT firm boundaries can be explained by economic theories including transaction cost economics (TCE) and strategic management theory on complementarities. Moreover, product market similarity is also an important predictor for M&A performance in the literature. I am interested in studying M&A performance hypotheses built based on those theories, while also focusing on aspects of this phenomenon that are specific to IT M&A. Specifically, I study the associations between acquiring firms' post-M&A performance with (1) acquirer's environmental uncertainty, (2) technological complementarity between acquiring and targeted firm, and (3) product market proximity between acquiring and targeted firm. I consider both financial performance and innovation performance as dependent variables.

2.1 Environmental Uncertainty

Even though M&A performance and its ex ante factors have been extensively studied in various fields during the past several decades, most of them focus on the characteristics of acquiring firm and the deal level covariates. Previous studies overlook the firm's fundamental motivation of M&A, and there has yet been any reported finding on how those motivations impact the performance of M&A ultimately. In other words, there might be some reasons for firms to choose to acquire an external firm instead of using alternative governance mechanisms with it, however we overlook these reasons and are not clear if firm made the right decision in the first place. M&A is one of the governance mechanisms for firms to acquire inputs, knowledge and technical know-how, while there exist other alternatives such as using market to buy, or contracting services to external vendors, or building alliances or equity joint ventures with other firms. Originating from influential works of Coase (1937) and Williamson (1975, 1985), transaction cost economics (TCE) theory has been proposed to explain the firm governance mechanism choice and extensively examined in its empirical studies. Neoclassical economics suggests that market is more efficient because of economies of scale or scope, while TCE argues that governance choice is also determined by the transaction cost of using markets such as the costs of search, negotiating, writing and enforcing contracts, and monitoring partners in the contractual relationships (Williamson, 1975). A fundamental axiom of transaction cost economics is that the firm boundaries are determined the trade-off between transaction cost of using markets and governance and production costs using hierarchies. TCE especially emphasizes on the importance of the cost associated with the governing and monitoring transactions of using markets (Leiblein & Miller, 2003). In some circumstances, the cost of governing and monitoring increases significantly and surpasses the efficiency gains provided by market exchanges. In his three-factor paradigm, Williamson (1985) suggests that frequency, uncertainty, and asset specificity are critical factors that drive up cost of using markets and make internal governance more attractive. The fundamental logic is that high degree of uncertainty and asset specificity result in highly complex contractual environment and greater need for adjustments to be made after the relationship has begun and commitments have been made (Holmström & Roberts, 1998). However, in hierarchies, firms have control over both sides of transactions, thus have less problem in potential disputes. In the context of this study, the focal firms who made M&As are high tech firms which seek IT knowledge base or technical know-how for either product development, expansion of product market or innovation capability enhancement. As discussed earlier, innovation seeking high-tech firms also have the choice of using market exchange, vertical integration through M&A, and engaging in strategic alliance to acquire assets and knowledge from external entities. Hagedoorn & Duysters (2002) argue that when making choice between M&A and strategic alliances as source of external innovation capabilities, firms have different preferences based on firm specific circumstances such as whether they are high tech firms or not and whether the innovation is related to their core business, but the decision is also made based on the environment in which they

operate. Uncertainty in the surrounding environment of innovation-seeking high-tech firms is an important factor to consider when making IT boundary choices.

Uncertainty refers to the degree to which unanticipated environmental change that might alter the conditions underlying an exchange. For example, an unexpected environmental change in a focal firm's industry may increase the number of contingencies of its contractual relationship with external service or product providers and make it costlier to write and enforce contingencies. Thus, firms which operate in a more uncertain environment are more likely to choose vertical integration or internal governance mechanism in acquiring inputs or knowledge. In the strategic management and organization theory literatures, environmental uncertainty has been conceptualized and studied quite thoroughly. Dess & Beard (1984) test several indicators in their factor analysis and conclude three dimensions of dynamisms, munificence, and complexity to be the indicators of the composite measure of environmental uncertainty. More specifically, dynamism represents the volatilities and unpredictability of changes in the business environment that a firm has to deal with (Keats & Hitt, 1988; Xue, Ray, & Gu, 2011; Xue, Ray, & Sambamurthy, 2012). For example, the industry is said to be highly dynamic, thus uncertain, if the sales volume or profitability is volatile and unpredictable over the years. As another indicator of uncertainty, munificence refers to the industry growth (Dess & Beard, 1984). The industries that are experiencing high rate of growth in demand or income are considered as those with high munificence. Munificence also increases firm's uncertainty because it tends to adopt strategies and structures that can help them capture these growth opportunities (Xue, Ray, & Gu, 2011). Complexity is the number and heterogeneity of task-environment elements in the industry in which a firm operates. In other words, firms find the industry highly complex if they are competing with more competitors or the industry is not concentrated or dominated by some big players. Firms find their industries to be very uncertain if they have high complexity because the entry of new players and/or turnover of existing competitors could be more frequent and unpredictable. The logic is that, in my quasi-experiment setting, there is variation in acquiring firm's industry environment. When it comes to IT knowledge acquisition, based on my argument earlier, those firms who face uncertain environment should have used hierarchy mechanism versus market exchanges or hybrid governance. Therefore, I expect that among those acquisitions that already happened, the acquiring firms in more uncertain environment will outperform their counterparts who should have not acquired because of their relatively stable environment. Therefore, my first set of hypotheses is:

Hypothesis 1A: Ceteris paribus, acquiring firm's pre-merger industry dynamism is positively associated with its post-merger performance.

Hypothesis 1B: Ceteris paribus, acquiring firm's pre-merger industry munificence is positively associated with its post-merger performance.

Hypothesis 1C: Ceteris paribus, acquiring firm's pre-merger industry complexity is positively associated with its post-merger performance.

2.2 Technological Complementarities

Relatedness between acquiring and target firm has been a commonly studied antecedent of M&A performance, and technological relatedness has been identified as an important predictor of post-merger innovation performance, especially for high-tech M&As. Ahuja & Katila (2001) find that the relatedness of acquired and acquiring knowledge base has a nonlinear impact on performance in terms of innovation output, and similar finding has been reported by Cloodt, Hagedoorn, & Van Kranenburg (2006) when they find that there is an inverted U-shape relationship between technological relatedness and post-merger innovation performance. These findings suggest that if the acquiring firm's technological knowledge bases are too different from those of target firm, the combined firm will not perform well in innovation after the merger. However, the innovation performance is also low when it goes to another extreme – being so related will in turn harm the innovativeness of the merged firm. M&As that integrate highly similar technology narrow the range of potential learning and also reduce the incentives to explore divergent research opportunities available from M&A (Makri, Hitt, & Lane, 2010). Cassiman et al. (2005) find that firms are more likely to reduce R&D efforts, and emphasize on the development over research when they acquire targets with more similar technologies than when they acquire targets with more complementary technologies. Therefore, acquiring firms would like to find a target firm which possesses technological knowledge base that is somewhat similar to theirs, but not too much similar because the optimum is that the target firm's knowledge base can provide new capability or know-how beyond their existing knowledge base for product/service innovation. I can call it "complementarity" in technological knowledge. The idea of complementarity is originally defined as "doing one of more thing increases the return to doing another" in economics by Milgrom & Roberts (1995). In the strategy literature, complementarity is an important construct

in the resource-based view (RBV) of the firm (e.g. Barney, 1991; Wernerfelt, 1984), where it has been depicted as mutual reinforcing assets, capabilities, and technology. Complementarity has been extensively studied as many of the areas in strategy field such as diversification (e.g. Harrison, Hall, & Nargundkar, 1993), strategic alliance (e.g. Gulati, Nohria, & Zaheer, 2000), and R&D (e.g Cassiman & Veugelers, 2006). In the context of M&A, complementarity is still underexplored. In a recent study by Finkelstein (2009), they examined the impact of strategic and marketing complementarity on acquisition performance, where they define acquisition complementarity as occurring when merging firms have difference resources, capabilities, and/or strategies that can potentially combined or reconfigured to create value that did not exist in either firm before the acquisition. Their empirical findings suggest that complementarity is an important antecedent of acquisition performance. There also exists complementarity of technological knowledge base between the acquiring firms and target firms. In a case study of 31 individual M&As, Cassiman et al. (2005) find that M&A partners with ex ante complementary technologies result in more active R&D performers after the M&A, suggesting that technological complementarity may lead to higher level of innovation in the merged firm than others who has lower level of complementarity. Makri, Hitt, & Lane (2010) provided empirical evidences showing that in technical M&As, complementary scientific and technological knowledge both contribute to post-merger invention performance by stimulating higher quality and more novel inventions. In this paper, M&As between acquiring firms and IT firms are essentially technological mergers as well, thus I follow the previous studies and propose a similar hypothesis:

> **Hypothesis 2**: Ceteris paribus, technological complementarity between acquiring firm and target firm is positively associated with post-merger performance of the combined firm.

2.3 Product Market Proximity

M&A has been argued to be more successful when the acquiring firm and the target firm are similar. The similarity in terms of resource, technology, and strategy between bidding firm and acquired firm is assumed to be positively correlated with post-merger performance by some researchers such as Prahalad & Bettis (1986), and empirical evidences have been found in later studies (e.g. Singh and Montgomery, 1987). Datta (1991) investigates the impact of organizational differences between acquiring and acquired firm on post-merger performance based on 173 M&As in U.S. manufacturing industry and result indicates that difference in management style is negatively correlated with post-merger performance for M&As characterized by both high and low levels of integrations. Similarly, Ramaswamy (1997) examines the impact of strategic similarities between target and bidder firms in U.S. banking industry on changes in post-merger performance and finds that mergers between banks exhibiting similar strategic characteristics result in better performance than those involving strategically dissimilar counterparts. On the other hand, some researchers suggest the opposite theoretical argument that uniquely value synergy might be created where differences (versus similarities) exist between resources in the acquiring and target firms (Harrison et al., 1991), where they find its positive impact on accounting performance when exploring synergies in resources allocations. Even though similarity between the bidding firm and acquired firm has been extensively studied, little of them focus on the similarity between their product market segments. Therefore, I will examine this question in this study. I follow the debates in the literature and think the same debate can also exist in product market similarity. On one hand, firms who have similar product lines are assumed to share common knowledge base and processes, thus the merger and acquisition requires less effort of integration and coordination, so an acquisition between a bidding firm and a target firm which has overlapped product lines may create more value for the acquiring firm. However, I can also argue that too much similarity in product market will hamper the performance of M&A because there is less unique knowledge, process, and know-how can be taken from the target firm to enrich acquiring firm's product lines, or in other words, there is less synergy could be created out from the merger. Therefore, the impact of product market relatedness of the acquiring and target firm is ambiguous, so I propose the following two competing hypotheses:

> **Hypothesis 3**: Ceteris paribus, product market similarity between acquiring firm and target firm is positively associated with post-merger performance of the combined firm.
>
> **Hypothesis 3 (competing)**: Ceteris paribus, product market similarity between acquiring firm and target firm is negatively associated with post-merger performance of the combined firm.

2.4 CEO Narcissism

Literature has suggested that CEO narcissism is positively related to firms' highly visible initiatives such as acquisitions. Malmendier & Tate (2008) find that the odds of making an acquisition are 65% higher if the CEO is overconfident. Chattejee & Hambrick (2007) also find that CEO narcissism is positively correlated with number

of size of acquisitions. However, the literature has yet reported any study which investigates the effect of CEO narcissism on firm's M&A success. Thus, I am interested in how CEO narcissism/overconfidence impacts the M&A performance directly and/or through moderating effect with other determinants in the model. As one of the proxy Chatterjee & Hambrick (2007) use in their study, I measure CEO narcissism as her relative compensation compared to the company's second highest paid executive. It is also consistent with the finding by O'Reilly et al. (2014) that narcissism CEO have more money in their total shareholding and have larger discrepancies between their own compensation and those of the others in the top management team. To make the model simple, I combine both cash-based compensation and equity-based compensation. As for the direction of the impact of CEO narcissism on acquisition performance, it is a two-fold story. On one hand, I argue that more narcissistic CEO has more ability and ambition to make M&A work and perform better than their counterparts, thus CEO narcissism is positively related with post-merger performance. On the other hand, narcissistic CEOs will be too aggressive and over rate their ability (and probably ignore others' opinions) to harness M&A gains (Gerster et al., 2013). Therefore, I propose a set of competing hypotheses:

Hypothesis 4: Ceteris paribus, CEO narcissism is positively associated with post-merger performance of the combined firm.

Hypothesis 4 (competing): Ceteris paribus, CEO narcissism is negatively associated with post-merger performance of the combined firm.

3. Research Methodology

3.1 Data

I test the hypotheses using a sample data of 477 M&As completed during 1990 to 2013. M&A deals with detailed information are obtained from Thomson One database. In order to be included in my sample, the acquiring firm should be in the technology intensive industry and acquired firm should be in the "IT industry" (SIC 357, 737, and 5045). Following the previous studies (Finkelstein and Haleblian, 2002; Makri, Hitt, and Lane, 2010), I only include those deals with transaction value of over ten million dollars because firms tend to adopt a hands-off approach with small acquisitions as their effects are likely to be negligible. Also, both acquirer and targeted firm need to be publicly traded firms in the United States because I need their annual financial data to calculate some of the independent variables and outcome variables. I start with 7,387 M&A deals announced from 1990 – 2013 with purchase price of at least ten million dollars. After applying the industry filter as discussed earlier, I narrow the sample size to 3,121. Further limitation to just public firm make us end up with 552 M&A deals before excluding deals that are essentially shares buyback. I also match the M&A sample with annual financial data such as revenue, net income, and return on asset (ROA) in Compustat database, and exclude those deals that miss the financial data for all three years prior to the M&A announcement. The final sample of 477 deals consist of 264 initiated by acquirers in software, computer-related services and data processing industry (SIC – 737), 120 from computer, computer peripheral equipment, and storage devices industry (SIC – 357), 29 from instruments, photographic, search and navigation equipment industry (SIC – 38), 28 from semiconductors and related devices industry (SIC – 367), 21 from telephone and communication equipment (SIC – 366), 4 from pharmaceutical and biological products industry (SIC – 283) and remaining acquiring firms are in some other high technology industries. All target firms are IT-related firms such as computer and hardware manufacturers, software and IT service vendors (SIC - 357, 737, and 5045).

3.2 Variable Definition and Operationalization

3.2.1 Industry Level Measures

I measure the industry level characteristics using industry sales data. Munificence is measured as the industry sales growth. I run a regression of industry sales on year indices for the past five years and use the coefficient of the regression as the proxy of the industry sales growth. Similarly, I run regressions of industry sales on year index and take the standard error as the proxy of volatility of industry sales to measure dynamism. Lastly, for industry complexity, I calculate the Herfindahl index of industry market shares as a measure of industry concentration.

3.2.2 Product Market Proximity

Following Bloom et al. (2013), I use the *COMPUSTAT* sales segments data to calculate the product market proximity for each pair of acquirer and target firm. For each firm, I collect the sales revenue in each of four-digit SIC industries and create a vector of sales distribution. For each pair, I calculate the cosine similarity measure which ranges from 0 to 1. Higher value in that similarity indicates higher overlap between acquirer's and target's product market.

3.2.3 Technological Complementarity

As for the technological complementarity measure, I collect patent application data from the *U.S. Patent and Trademark Office*. For each firm in my sample, I collect the number patents successfully applied in each year of observation and the associated category information. Patents are categorized to different classes and subcategories. I measure the technology complementarity of the acquirer and the target by taking the average number of acquiring and target firms' patents in the same subcategory but in different patent classes. If two firms apply patents in completely different categories or in exactly the same class, those two firms are either too different or too similar in terms of technological know-how and capability, which means they do not complement each other. My measure very well captures the degree to which both firms are complementarities.

3.2.4 CEO Narcissism

I use the CEO compensation data as the proxy of CEO narcissism because based on Chatterjee & Hambrick (2007), CEO relative compensation compared to his or her TMT team is one of the aspects to measure narcissism. I collect the CEO compensation data from the *COMPUSTAT Execucomp* database. I take the ratio of the CEO's compensation to the firm's second highest paid executive's cash pay to calculate the relative pay of the CEO.

3.2.5 Control Variables

Following the previous literature, I control for the acquirer's size, relative size, prior performance, CEO age, and CEO gender in the model because they are the confounding factors that might impact the dependent variables. Firm size is captured by the number of employees, prior performance is measured by return on assets (ROA), and other CEO characteristics are self-explanatory.

3.2.6 Dependent Variables

There are two dependent variables of interest to measure the post-merger performance of the acquiring firm. First, I use the industry-adjusted revenue weighted ROA at t+1 to measure the profitability of the combined firm. On the innovation side, I use the number of patents acquiring firm filed (and eventually granted) at t+1 where t+1 is the year after the acquisition year.

Table 1. Variable Definitions

Variable	Definition/Operationalization
Industry Sales Growth (Munificence)	Growth of industry sales (coefficient of a regression of industry sales on year index for the past five years)
Industry Sales Volatility (Dynamism)	Volatility of industry sales (standard error of a regression of industry sales on year index for the past five years)
Industry Concentration (Complexity)	Herfindahl index of industry market shares
Product Market Proximity	Average uncentered correlation between firms paring vector of share of sales of firm in the 4-digit SIC industry
Technological Complementarity	Average number of acquiring and target firms' patents in the same subcategory but in different patent classes
CEO Narcissism	Average ratio of CEO's compensation and firm's second highest paid executive's cash comp
Post-merger Innovation Performance	Numbers of patents acquiring firm filed (and eventually granted) at year t+n (n=1, 2)
Post-merger ROA	ROA at year t+n (n=1, 2)

4. Results

4.1 Effect on Profitability

I conduct regression analyses of return on assets (ROA) on controls and variables of interests. In Table 2, I report the results ROA at t+1. Column 1 shows the regressions results of OLS model with only control variables included. Prior ROA, acquirer's size and CEO tenure are found to be positively correlated with the ROA after the M&A deal. In Column 2, I add the main independent variables in the model, and only environment dynamism (industry sales volatility) is positively correlated with the dependent variable (0.041, $p < 0.01$). I find the positive relationships between environment complexity, technological complementarity, and CEO narcissism and ROA, but they are not statistically significant at 5% level. Since I do not much of linear relationships, I test the curvilinear relationships. In model 3, I include the quadratic terms of product market proximity, and CEO narcissism and find different results. The reason I test the squared terms of proximity and CEO narcissism is because both of them tend to harm the organization if we go to extremes. Overly similar product market coverage between the acquirer and the target firm might decrease the value of the M&A deal since there is little complementarity whereas companies with too different product offerings may also not benefit a lot from the

acquisition. Moderate level of product market proximity, in turn, might be the best for the M&A to create value. Similarly, I speculate that acquirer needs a somehow (but not too) narcissistic CEO to make the deal work the best. Therefore, I also hypothesize inversed U-shape relationships between those two characteristics and the outcome variable. The coefficient of PMP squared still stays insignificant, so does the PMP itself. However, I find that the coefficient of technological complementarity (0.212, $p < 0.01$) which indicates that acquirer-target pair who has higher level of technological complementarity tends to have higher performance in profitability as a combined company after one year of merge. More interestingly, I find the positive relationship between CEO narcissism and post-M&A performance (0.07, $p < 0.05$) and negative coefficient on the quadratic term of CEO narcissism (-0.013, $p < 0.01$) suggesting the inversed U-shape relationship, as I hypothesized. Model 3 shows better estimations as the adjusted R^2 is increased from 12% to 19% compared with base model. The last column of Table 2 presents additional finding about the interaction effect between CEO narcissism and technological complementarity. The reason why I propose this hypothesis is because CEO usually has much involvement in the re-structuring process for the combined firm. A CEO with higher ability (thus more narcissistic and higher pay) tends to better leverage the complementarity and make higher profit after one year of integration. Therefore, I suggest that there is positive interaction effect between those two variables. Not surprisingly, I find that the coefficient of that interaction term is positive (0.077, $p < 0.05$), which is consistent with my hypothesis.

Table 3 presents the results of regression analyses of ROA two years after the M&A on the same set of predictors. Across all models, control variables on CEO characteristics include age and tenure are found to have positive impact on the ROA. For main variables of interest, I still do not find much evidence on the impact of environmental uncertainty on profitability. Among them, I only find positive impact of industry dynamism, but the results are not significant at 5%. Munificence is found to have negative impact on the ROA, but the results are also not very significant. Product market proximity between the acquirer and target has a surprisingly negative impact on ROA, which is contrary to the hypothesis. This is consistent with the finding in Table 2. I still find positive and significant relationship between technological complementarity and ROA at t+2. This results consistently show up in model 3 and model 4 where curvilinear and interaction terms are included, and R squared is higher. This finding suggests that technological complementarity is vital to acquirer's profitability even after two years of the acquisition. Recall that there is inversed U-shaped relationship between CEO narcissism ROA, however I do not find such relationship in the model of ROA at t+2. Though I do not find main effect of CEO narcissism, I still find the positive interaction effect of that with technological complementarity (0.29, $p < 0.05$).

4.2 Effect on Innovation Performance

In addition to profitability, I also examine the innovation capability measured by numbers of patents acquiring firm filed (and eventually granted) at year t+1 and t+2. Since number of patents is a count variable, I use negative binomial model to estimate. Table 4 presents the regression results of number of patent applied (and eventually granted) at t+1. None of the main independent variables has significant estimated coefficients except for technological complementarity (2.77, $p < 0.01$). I also test the model for t+2 and find similar results.

5. Conclusions

In this paper, I examine the antecedents of successful IT M&As. Drawing from several theories from strategic management, I propose several hypotheses about the impact of acquiring firm's environmental uncertainty, pairwise technology complementarity, product market proximity, and the acquiring firm's CEO narcissism. Dependent variables of interests include profitability and innovation capability after one or two years of M&As. The empirical analyses generally do not support my hypotheses on environmental uncertainty such that I do not find evidence that acquirers operate in more uncertain environment tend to perform better in after M&As. Product market proximity also does not seem to be related to post-M&A performance of the combined firm. However, I do find that technological complementarity between acquiring and target firm is vital to the success of acquisitions. In models of profitability and innovation capability, I find positive effects of technology complementarity. CEO narcissism, however, has only been found to have positive impact on profitability, and more interestingly, there is an inversed U-shaped relationship. Taken together, those findings suggest that environmental characteristics are not as important as technological "fit" between acquirer and target and CEO ability is not always helpful to make the deal work. Also, similarity or proximity of product market is not necessarily important to post-M&A performances.

My hypotheses are partially supported. Hypotheses 1 are not supported based on the empirical testings. Hypothesis 2 regarding technological complementarity is strongly supported as I find consistent significant and positive relationships between it and dependent variables in different forms. Regarding Hypothesis 3 on product

market similarity, I have a set of competing hypotheses. It seems that the empirical testing favors the argument that too similar product market hurts the M&A performance in terms of ROA, but no support is found for patent-based performance measure. For the last hypothesis about CEO narcissism, I also have a set of competing hypotheses. Empirical testing supports that CEO narcissism is favorable for ROA at t+1, and surprisingly, on top of the main effect, I found non-linear relationships (inverted U-shaped) indicating that too little or too much CEO narcissism is hurting, which is somehow consistent with my original competing hypotheses.

Table 2. Regression Analysis of Return on Assets (t+1)

Accounting Performance	**DV: ROA (t+1)**			
	OLS Null Model	**OLS Base Model**	**OLS Curvilinear**	**OLS Curvilinear Interactions**
Intercept	-0.335 (-2.26)**	-0.72 (-3.89)***	-0.659 (-1.76)†	-0.643 (-1.77)†
Prior ROA	0.598 (3.87)***	0.636 (3.71)***	0.602 (3.24)***	0.596 (3.25)***
Acquirer Size	0.001 (1.71)*	0.000 (0.76)	0.0004 (7.1)***	0.0006 (3.78)***
Relative Size	2.79e-06 (0.26)	7.02e-06 (0.64)	5.74e-06 (1.76)†	5.78e-06 (1.75)†
CEO Age	0.005 (1.54)	0.007 (2.02)**	0.006 (1.49)	0.007 (1.52)
CEO Tenure	0.005 (1.8)*	0.006 (1.81)*	0.005 (2.52)**	0.005 (2.7)**
Industry Sales Growth (Munificence)		0.007 (0.82)	0.005 (0.96)	0.005 (0.91)
Industry Sales Volatility (Dynamism)		0.041 (2.6)***	0.04 (1.71)	0.041 (1.71)
Industry Sales Concentration (Complexity)		0.000 (1.81)*	0.000 (2.04)*	0.000 (2.07)*
Product Market Proximity		-0.005 (-0.09)	-0.118 (-1.1)	**-0.229 (-1.79)***
Product Market Proximity^2			0.111 (0.88)	0.109 (0.93)
Technological Complementarity (TC)		0.237 (1.26)	**0.212 (2.78)*****	**0.206 (2.78)*****
CEO Relative Compensation		0.041 (1.49)	**0.07 (2.48)****	**0.043 (3.69)*****
CEO Relative Compensation^2			**-0.013 (-6.37)*****	**-0.013 (-6.06)*****
CEO Relative Compensation * TC				**0.077 (2.54)****
Observation	342	303	301	301
F-Ratio	5.41***	4.31		
Adjusted R^2	0.07	0.12	0.19	0.19

Robust standard errors are adjusted for 14 clusters in industry. t scores are in the parentheses.

, **, * indicates that $p < 0.1$, $p < 0.05$, and $p < 0.01$, respectively. † means the coefficient is marginally significant.*

Table 3. Regression Analysis of Return on Assets (t+2)

Accounting Performance	DV: ROA (t+2)			
	OLS Null Model	OLS Base Model	OLS Curvilinear	OLS Curvilinear Interactions
Intercept	-0.847 (-2.96)***	-1.326 (-3.51)***	-1.317 (-2.31)**	-1.257 (-2.38)**
Prior ROA	0.041 (0.14)	-0.031 (-0.09)	-0.024 (-0.17)	-0.039 (-0.26)
Acquirer Size	0.000 (0.61)	0.000 (0.07)	3.1e-06 (0.01)	0.0005 (2.67)**
Relative Size	4.01e-06 (0.2)	9.38e-06 (0.44)	8.21e-06 (1.58)	8.31e-06 (1.58)
CEO Age	0.014 (2.4)**	0.016 (2.27)**	0.016 (2.33)**	0.018 (2.34)**
CEO Tenure	0.009 (1.59)	0.011 (1.66)*	0.009 (3.07)***	0.01 (3.42)***
Industry Sales Growth (Munificence)		-0.011 (-0.65)	-0.012 (-1.8)*	-0.012 (-1.92)*
Industry Sales Volatility (Dynamism)		0.064 (1.96)**	0.059 (1.81)*	0.062 (1.82)*
Industry Sales Concentration (Complexity)		0.000 (0.85)	0.000 (1.4)	0.000 (1.55)
Product Market Proximity		0.02 (0.18)	0.136 (1.25)	**-0.277 (-2.2)****
Product Market Proximity^2			-0.135 (-1.13)	-0.149 (-0.79)
Technological Complementarity (TC)		0.303 (0.79)	**0.273 (2.82)****	**0.244 (2.58)****
CEO Relative Compensation		0.083 (1.53)	0.083 (1.87)*	-0.015 (-0.55)
CEO Relative Compensation^2			-0.002 (-1.23)	-0.003 (-1.38)
CEO Relative Compensation * TC				**0.29 (2.74)****
Observation	324	289	287	287
F-Ratio	2.17**	1.79**		
Adjusted R^2	0.02	0.03	0.07	0.09

Robust standard errors are adjusted for 14 clusters in industry. t scores are in the parentheses.
, **, * indicates that p < 0.1, p < 0.05, and p < 0.01, respectively. † means the coefficient is marginally significant.*

Table 4. Regression Analysis of Innovation Performance (t+1)

Innovation Performance	DV: Patent (t+1)			
	Negative Binomial Null Model	Negative Binomial Base Model	Negative Binomial Curvilinear	Negative Binomial Curvilinear Interactions
Intercept	1.939 (2.04)**	-0.254 (-0.19)	-0.402 (-0.19)	-0.324 (-0.14)
Prior ROA	5.102 (4.77)***	5.572 (4.87)***	5.92 (6.27)***	5.968 (6.33)***
Acquirer Size	0.006 (0.97)	0.001 (0.11)	0.001 (0.29)	0.002 (0.41)
Relative Size	0.000 (0.45)	0.000 (0.49)	0.000 (1.13)	0.000 (1.13)
Prior Average Patent	0.003 (4.6)***	0.003 (4.27)***	0.003 (1.95)**	0.003 (1.88)*
Prior R&D Intensity	0.933 (1.89)*	1.216 (2.26)**	1.493 (2.54)***	1.506 (2.59)***
CEO Age	0.021 (1.12)	0.058 (2.45)**	0.059 (2.48)***	0.062 (3.1)***
CEO Tenure	0.023 (1.13)	0.024 (1.08)	0.022 (1.71)*	0.019 (2.09)**
Industry Sales Growth (Munificence)		-0.013 (-0.26)	-0.014 (-0.47)	-0.007 (-0.3)
Industry Sales Volatility (Dynamism)		-0.17 (-1.65)*	-0.162 (-1.3)	-0.168 (-1.41)
Industry Sales Concentration (Complexity)		0.000 (0.63)	0.000 (0.75)	0.000 (0.91)
Product Market Proximity		0.478 (1.21)	1.111 (1.01)	0.58 (0.37)
Product Market Proximity^2			-0.64 (-0.52)	-0.555 (-0.47)
Technological Complementarity (TC)		**2.786 (1.96)****	**2.806 (2.54)*****	**2.77 (2.4)*****
CEO Relative Compensation		0.014 (0.07)	0.065 (0.67)	-0.079 (-0.37)
CEO Relative Compensation^2			-0.017 (-0.77)	-0.016 (-0.58)
CEO Relative Compensation * TC				0.296 (0.56)
Observation	355	314	312	312
Log Pseudo-likelihood	-1530.647	-1363.413	-1357.933	-1357.652
Over-dispersion Alpha	1.6e+05***	1.3e+05***		

Robust standard errors are adjusted for 14 clusters in industry. z scores are in the parentheses.
, **, * indicates that p < 0.1, p < 0.05, and p < 0.01, respectively. † means the coefficient is marginally significant.*

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The Policy Research for the Improvement of Excessive Marriage Expense in South Korea

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Abstract

Excessive marriage-related expenses have become a serious social problem in South Korea. This has led to marriage delay, a low birthrate, the acceleration of an aging society, decreased national economic growth, and employment problems, among others. In South Korea, the young unmarried men and women cannot adequately prepare to shoulder the excessive expenses related to getting married in the future, as well as the high cost of purchasing a house. In fact, almost all of them are being supported by their parents in their marriage preparations or have secured a loan for such purposes. Small weddings and desirable consumption are thus aggressively being promoted for the prevention of excessive marriage-related expenses in South Korea. The reality, however, is very different. In this study, 1,000 persons (500 men, 500 women) in Seoul, South Korea with less than 5 years of marriage were surveyed for the analysis of excessive marriage-related expenses. The analysis results show that marriage expense support has long-term reciprocity and is statistically significant. The economic support beneficiary model is statistically significant both among the men and the women for childcare, housework, and economic support provision. The economic support provision model, on the other hand, is statistically significant among both the men and the women in terms of housework support.

This paper discusses and presents the policy direction for addressing the problem of excessive marriage-related expenses in South Korea. It is believed that the policy direction proposed by this study will also have global implications and will become useful for addressing the problem of excessive marriage-related expenses through research result sharing.

Keywords: policy research, marriage, marriage expenses, excessive expenses, men, women, economic support, family, young people

1. Introduction

Marriage is decided through mutual agreement between a man and a woman (Mair, 2006). In recent years, the same sex marriage is legally recognized in many Western countries (United States, Canada, United Kingdom, France, Germany, Netherlands, Belgium, etc.). It should also gain social recognition, which is realized through the wedding, a form of social announcement of a couple's marriage in front of the couple's family members, relatives, friends, colleagues, acquaintances, etc (Lin, et al., 2017; Wong, 2003). The wedding is the most common social phenomenon, but as a social convention, it entails economic costs (Allendorf & Ghimire, 2013; Carrington, 2002; Quinn, 2007). In South Korea, many families spend excessively for the wedding ceremony, through negotiations between the couple's families. Excessive marriage-related expenses are a general phenomenon related to marriage preparations in the country. As a consequence, the number of young unmarried men and women has rapidly increased of late due to the young men and women's delaying and dodging of marriage. The increase in the first-marriage age is a representative index for this. Job, marriage, and childbirth abandonment have also become social buzzwords and serious social problems in South Korea, and excessive marriage-related expenses is the major cause of marriage abandonment. In the statistical report (2016) of Korea National Statistical Office (KOSTAT), the average age of the men in South Korea at the time of their first marriage is 32.8, and that of the women is 30.1. The major reason for the delaying and dodging of marriage is the excessive financial burden imposed by marrying. According to the research report (2016) of the Ministry of Gender Equality & Family (MOGEF) of South Korea, the average cost of marriage for the South Korean men is USD152,685, and that for the South Korean women is USD82,212. The high cost of purchasing a house

accounts for a large portion of the excessive marriage-related expenses, and the house lease cost is almost equal to the house purchase cost. Young unmarried men and women cannot adequately prepare themselves to shoulder the house purchase cost because the country's financial system lacks provisions for mortgage, house lease cost support, and house purchase cost support. The parents are thus the ones who often shoulder a considerable part of the excessive marriage-related expenses, which imposes a financial burden on them. Marriage means that a man and a woman form a new family and maintain their independence in terms of economic resource management, but at present, the parents shoulder a large part of their children's marriage-related expenses so that their children can have an independent economic life, and based on this, their children acquire the ability to lead their own families independently. In South Korea, however, the parental support of the children does not end with the children's marriage. If a child requests for economic support from his/her parents after marriage, the parents usually oblige, providing their married children support for their purchase of a house and a car, and providing their married children childcare support, etc. This has become a serious social problem in South Korea. This article presents and discusses the proposed policy direction for addressing the problem of excessive marriage-related expenses. It is expected that the policy direction presented in this paper for addressing the problem of excessive marriage-related expenses will contribute to the prevention thereof, and of marriage delay. It is also believed that the policy direction proposed by this study will have global implications and will become useful for addressing the problem of excessive marriage-related expenses through research result sharing.

2. Theoretical Review

2.1 Transactional Characteristics of Marriage

Family relations include blood relationships and relationships with one's in-laws. The parent-child relationship is a representative blood relationship while conjugal relations are representative in-law relationships (Amato, 2007). Many anthropologists believe that the history of marriage can be traced to the legal position of women in the past, and their legal and economic dependence on men, who were the ones who possessed assets (Sherman & Badillo, 2007). Actually, marriage in the olden times was a contractual relationship that included various rights and obligations based on economic transactions rather than on romantic love. Scholars' definition of marriage confirms that marriage involves the transfer or flow of rights. It is a customary transaction that establishes the justification for a child to be born in the future from the relations between a man and a woman, a kind of transaction, and the resulting contract (Brake, 2007). The bride price and dowry are representative transactional characteristics of marriage. The bride price is the reward for childbirth and the accompanying labor, with the newborn transferred to the groom. It is a value that the family of the groom pays to the family of the bride, and is based on the importance accorded to the labor force of women as well as to the low status of the women in the society (Fincham, et al., 2007). The dowry consists of goods or money given by the groom's family to the bride's family. It is given to the bride and is regarded as her share in the assets of her family. In most cases, the transactions are done, and a deal is reached, by the parents and relatives of the bride and groom. The rationale behind this is that the groom and bride cannot shoulder their marriage-related expenses by themselves alone as these are excessive. The marriage is decided in accordance with the opinion of the one who will shoulder the marriage expenses, with the bride and groom agreeing formally to the decision (Mincy, et al., 2009). Since recently, however, women's property rights have been guaranteed, and the decision to marry has become voluntary on the part of the men and women in modern society. In most cases, the practices of spending much to prepare for the newly married couple's new life (house purchase, etc.) and of the ceremonial spending (wedding, honeymoon, etc.) are difficult to explain because in South Korea, the newly married couples are independent.

2.2 Social Exchange Theory

The social exchange theory combines the economics, psychology, and sociology of mankind. It provides the framework of human relationships and gains sympathy from people for such relationships (Gottman, et al., 2002). This theory states that social interactions are formed and sustained for the motive of promoting people's respective interests, and that all the social-interaction actors progress while participating in a reciprocal compensatory behavioral system. The understanding of exchange resource and exchange method is premised on the analysis of the exchange situation (Singh, 2012). The exchange situation can be classified into the distributive exchange situation or the productive exchange situation. In a distributive exchange situation, the resource exchanged by the parties involved is a single type of the same-value resource. The exchange method involves direct transaction for the counterpart resource, and the characteristics of the relationship are determined through the relative exchange ratio of resources (Lefgren, & McIntyre, 2006). In a productive exchange situation on the other hand, the resources exchanged are the independent resources of each of the actors. The exchange method involves the joint consumption of the items jointly produced as calculated in combination with the other party's resources after the joint venture, or exchanging them with the other resources of an outsider (Groot &

Van Den Brink, 2003). To justify the hypothesis that the marriage cost will prove to be a productive exchange, the characteristics of the exchange are presented as follows. The first phase in the marriage process, in which a marriage decision is made from among the several promising prospects. According to the social exchange theory, when a person perceives himself/herself to be in a state of equilibrium, an exchange relationship is established, which means that the two persons have equilibrated in terms of the marriage exchange resources. Equilibrium here is in terms of complementarity. The second phase is the marriage preparation, which is the physical basis of life after the marriage decision. The bride and groom start a cooperative relationship in an exploratory relationship after making a marriage decision, and contribute their own independent resources to come up with a worthy product. In this case, the resources to be jointly invested are the marriage-related expenses. It has the transaction character of a productive exchange. One factor that is considered in determining the value of the product in a productive exchange is the quality of the invested resource unit. The more valuable the invested resource unit is, the greater the efforts that will be exerted to invest the best resource so that a greater value can be created. The third phase is the beginning of the marriage relationship with the end of the honeymoon. At this phase, the jointly invested products consumed through the interactive combination of the jointly invested resources are consumed. It is also assumed that this phase is related to marriage satisfaction. A productive exchange resource is an explanatory framework that applies to general marriage situations (McKenzie & Dales, 2017; Meltzer, et al., 2013). It is necessary to analyze the multilateral approach to the marriage situation, in which the contract between the couple's resources necessary for their marriage is entered into before the formal cooperative relationship begins.

2.3 Consumption Culture of Marriage

The composition of cultural text is very different from the quantitative concept of marriage in the approach to determining the qualitative aspect of marriage. It is a natural process of growth due to the characteristics of marriage, and is strongly attributed to a ritual reflecting values, cultures, and norms. The visible value of two families, which is higher than the original value of the combination of two persons, creates a new consumer culture of marriage (Legros & Newman, 2010; Madison & Madison, 2013). In South Korea, the group culture is more important than the individual culture. Other people's eyes are perceived to be the most fearful factor. Therefore, ostentation rather than individual substance has a direct impact on the outcome of consumption. Critical opinions about the marriage of other persons are expressed, but there are contradictory consequences on one's own marriage. The wedding ceremony in South Korea has not improved from days past, and has been criticized. In the South Korean society, marriage is a typical consumption-related decision-making process in which the competitiveness and social status of a family are presented to the world. The marriage cost has a higher correlation with the income level or social status of the couple's parents than with the income of the man and woman to be married. The parents' influence on the marriage cost has a great impact. Marriage needs preparation in terms of the wedding ritual, honeymoon, etc., and focus should be placed on the cost, time, and efforts to be expended. Although weddings are of great value, excessive marriage-related expenses has become a serious problem. Thus, since recently, the young persons in South Korea have come to prefer a substantial but low-cost marriage. The consumers are bound to form a creative and sustainable consumer culture for such new creative practice through the consumption of small weddings.

3. Global Marriage Culture Trend

In the United States, weddings are traditionally gorgeous. Of course, this means that the weddings are maximized according to the life and economic situation of the couple to be married. The marriage cost almost entirely involves the expenses for the wedding ceremony itself and the reception. The focus is on having wonderful weddings and great parties, even if holding these will entail excessive expenses. Since recently, however, many men and women in the United States have opted to marry frugally. Marriage-related expenses rarely become huge, except those for the wedding ceremony itself. The marriage culture is becoming increasingly practical. Parties and events are also more frugal than spectacular.

The United Kingdom also has a pragmatic and frugal marriage culture. As 90% of the British are Anglican, most of the weddings are held in the church. The groom takes care of the expenses, such as renting a wedding venue, and the bride pays for the bouquets, corsages, decorations, etc. Since recently, the grooms and brides have been very practical with regard to their marriage cost. Couples jointly shoulder the marriage expenses as well as the purchase cost of their new house. Also, the number of couples who put their property under both their names is increasing.

In Japan, most of the young people start their new life by borrowing money to purchase a small house. The wedding ceremony is gorgeous, and most of the young people prepare themselves for their marriage by saving.

They themselves shoulder the cost of their own marriage, and they celebrate and consider it the most splendid day in their life. They believe that they cannot impose on their parents that the latter provide them with marriage expense support. This is a common belief among the young people in Japan. The number of single people is rapidly increasing, however, and marriage is delayed for economic reasons.

In many Western countries, the same-sex marriage is introduced in the form of marriage based on human rights and citizenship rights such as individual rights to pursue happiness and equal rights. The first law providing for the same sex marriage was enacted in 2001 in the Netherlands. In recent years, the same sex marriage is legally recognized in many Western countries (United States, Canada, United Kingdom, Germany, France, Netherlands, Belgium, Iceland, Ireland, Luxembourg, Australia, Denmark, Sweden, Norway, Finland, Spain, Portugal, etc.).

4. Problems with regard to the Excessive Marriage-related Expenses in South Korea

Since recently, economic problems (low income, employment instability, etc.) and excessive marriage- and housing-related expenses have become major factors for marriage delay and for avoiding marriage all together in the South Korean society. Marriage delay and the increase of the unmarried rate are the major factors contributing to a low birthrate. The decrease in the number of married couples and the higher marriage age are closely connected to economic problems (low income, employment instability, etc.) and to excessive marriage-related expenses. In South Korea, the number of young unmarried men and women has greatly increased due to indefinite marriage delay or the decision not to get married at all owing to the continuous employment instability, the high rate of youth unemployment, the high house prices, and the excessive marriage-related expenses. According to the report of South Korea's Ministry of Health and Welfare (MOHW) on the results of its 2013 marriage and childbirth trend survey, only 67.5% of the young unmarried men survey respondents and 56.6% of the young unmarried women survey respondents expressed the belief that marriage is needed. The young unmarried women's awareness of the necessity of marriage was especially low. In addition, 40.4% of the young unmarried men and 19.4% of the young unmarried women indicated that they could not marry due to economic problems (low income, employment instability, etc.), and 87.8% of the young unmarried men indicated that employment instability is the major factor for their marriage avoidance while it was the excessive marriage expenses for 86.3% of the young unmarried women. Korea Consumer Agency (KCA) of South Korea surveyed the awareness of the pressure caused by the high marriage cost among 500 marriage-contracting parties and 500 parents (2013). The survey results are shown in Table 1.

Table 1. Survey results for marriage cost pressure awareness

Classification		Wedding cloth	Wedding present	Home furnishing	Wedding cost	Honeymoon	House purchase cost
Marriage-contracting parties	Mean	3.64	3.62	3.63	3.49	3,52	4.40
	N	367	376	403	475	415	427
	Standard deviation	0.888	0.865	0.900	0.997	0.927	0.793
Parents	Mean	3.59	3.54	3.56	3.47	3.43	4.39
	N	367	392	417	489	430	469
	Standard deviation	0.927	0.951	0.923	0.943	0.889	0.779

Marriage has been expanded in appearance of late for the commercial and material aspects, and the marriage cost is continuously increasing. This is the major cause of marriage avoidance and points to excessive consumption and empty formalities and vanity (Ministry of Gender Equality & Family (MOGEF) of South Korea, 2012). The number of young unmarried men and women is greatly increasing due to the indefinite marriage delay or the decision not to get married at all owing to the escalating cost of holding a wedding. To help their children, parents give up their preparation for old age or secure a loan for their child's marriage. Economic support is given by the parents to their children to ensure the stability of the newlyweds' new life together. This, however, is done at the expense of the economic stability of the parents in their old age. To prevent this from happening, many young people in South Korea have opted to delay their marriage or even not to get married at all. As a result, the marriage rate is decreasing, and the birthrate is becoming lower.

5. Analysis Data and Research Specimens

In this study, the population group consisted of 1,000 persons (500 men, 500 women) in Seoul, South Korea with less than 5 years of marriage. The marriage and childbirth trend survey result report (2016) of the Ministry of Gender Equality & Family (MOGEF) of South Korea was utilized for this study. The utilized data were samples extracted from the population group through cluster sampling. The research data were extracted through the

framework of sampling in cluster sampling. The general characteristics of the survey sampling that was done are listed in Table 2. In this study, the dependent variables were economic support benefit and economic support provision. Economic support benefit refers to the economic assistance given by the parents of the spouses. Economic support provision, on the other hand, refers to the economic assistance given by men and women to their parents. The independent variables were the matrimonial home, marriage cost, childcare support, and housework support. The independent variables were surveyed to determine if the subjects received parental assistance for these or provided these for themselves. The control variables were the average monthly income, family size, home ownership, and number of children. The natural log value was applied to the analysis model of the average monthly income.

Table 2. General characteristics of survey sampling

Classification	Variable	Response	Mean		Standard deviation	
			M	W	M	W
Dependent variable	Economic support benefit	Yes	331	290	62	58
		No	169	210	38	42
	Economic support provision	Yes	269	281	54	56
		No	231	219	46	44
Independent variable	Matrimonial home	Parental support	391	53	78	11
		Self-providing	109	447	22	89
	Marriage cost	Parental support	415	389	83	78
		Self-providing	85	111	17	22
	Childcare support	Yes	235	396	47	79
		No	265	104	53	21
	Housework	Yes	166	388	33	77
		No	334	112	67	23
Control variable	Marriage duration	1	109	118	22	23
		2	120	104	23	20
		3	91	80	18	16
		4	102	92	20	19
		5	78	106	17	12
	Education level	College graduation	374	403	74	80
		Master's graduation	107	86	21	17
		Doctoral graduation	19	11	5	3
	Job	Unemployed	16	39	4	10
		Temporary position	101	140	20	28
		Self-employed	131	143	26	29
		Government/public institute	80	68	16	14
		Large/midsize company	118	87	23	17
		Specialized job	54	23	11	2
	Average monthly income	Average monthly income	USD 3,456	USD 3,001	-	-
	Family size	Average number of members	2.3	2.8	-	-
	Home ownership	Yes	191	38	101	20
		No	309	62	399	80
	Child	Yes	219	261	44	52
		No	281	239	56	28

Note. M = Men, W = Women

6. Research Method Design for Analysis

The mean and the standard deviation were calculated for the analysis of the general characteristics of the sampling, and cross-tabulation was proposed for the analysis of the interrelations of the variables. Cross-tabulation is a method for the analysis of the correlations of the categorical variables. It is a method that utilizes frequency analysis for the mutual independence and relevance analysis of the research variables. In this research, the chi square test was utilized in the algorithm of the crosstabs for the statistical significance test. The verification statistics could be calculated through the chi square distribution. The results of the analysis showed that when the difference was significant, the variables had a correlation. Below is the detailed formula.

$$x^2 = \sum_i \sum_j \frac{(f_{ij} - E_{ij})^2}{E_{ij}} \quad (1)$$

In this study, the binary logistic regression model was utilized for the influence factor analysis of the variables. The sum of the Bernoulli trial results is the binomial distribution. Below is the detailed formula.

$$P(X=x)={}_nC_x\pi^x(1-\pi)^{n-x}=\binom{n}{x}\pi^x(1-\pi)^{n-x}=\frac{n!}{x!(n-x)!}\pi^x(1-\pi)^{n-x} \quad (1)$$

Below is the detailed formula for the mean of the binominal distribution.

$$\mu=E(X)=n\pi=np \quad (2)$$

Below is the detailed formula for the variance of the binominal distribution.

$$\sigma^2=E(S^2)=n\pi(1-\pi)=np(1-p)=npq \quad (3)$$

7. Analysis Results and Interpretation

Cross-tabulation and correlation analysis were conducted for economic, housework, and childcare support, and the results are shown in Table 3. For economic support, 83% of the male survey respondents and 79% of the female survey respondents were receiving childcare support from their parents while 66% of the men and 71% of the women were receiving housework support. Twelve percent of the men and 5% of the women were not receiving childcare support from their parents, and 44% of the men and 11% of the women were not receiving housework support from them. These results may indicate that economic, housework, and childcare support are provided all together. The correlation coefficients of economic and childcare support are 0.599 for the men and 0.590 for the women while those of economic and housework support are 0.621 for the men and 0.611 for the women. When men and women are receiving economic support from their parents, childcare and housework support are almost always provided as well. In other words, married men and women are being supported in various ways by their parents.

Table 3. Analysis of economic, housework, and childcare support

Classification			Childcare support				Housework			
			M		W		M		W	
			Yes	No	Yes	No	Yes	No	Yes	No
Economic support	Yes	n	275	56	229	61	219	112	205	85
		%	83	17	79	21	66	34	71	29
	No	n	150	19	199	11	95	74	187	23
		%	88	12	95	5	56	44	89	11
x^2			1006.14***		1078.60***		1006.14***		1008.71***	

Correlation coefficient				
Classification	Childcare support		Housework	
	M	W	M	W
Economic support benefit	0.599***	0.590***	0.621***	0.611***

Note. M = Men, W = Women, ***p<0.01

Cross-tabulation was also done for the analysis of the correlation between economic support benefit and marriage duration, and the results are shown in Table 4. When the marriage duration increased, the economic support benefit given by the parents minutely decreased. The economic support benefit and economic support provision were thus researched on.

Table 4. Economic support for marriage duration

Classification			Marriage duration									
			1 year		2 years		3 years		4 years		5 Year	
			M	W	M	W	M	W	M	W	M	W
Economic support benefit	Yes	n	70	57	63	59	71	65	67	54	60	55
		%	21	20	19	20	22	22	20	19	18	19
	No	n	33	38	35	45	33	47	34	39	34	41
		%	20	18	21	21	19	22	20	19	20	20
Economic support provision	Yes	n	51	51	58	59	60	50	49	53	55	60
		%	19	19	21	21	22	19	18	20	20	21
	No	n	59	49	50	43	41	41	43	46	38	40
		%	25	22	22	20	18	19	19	21	16	18

Classification	x^2	
	Men	Women
Economic support benefit	39.183***	41.821***
Economic support provision	23.910***	28.349***

Note. M = Men, W = Women, ***p<0.01

The economic support for the marriage-related expenses and the matrimonial home purchase cost is shown in Table 5.

Table 5. Economic support for marriage cost and matrimonial home

Classification			Marriage cost			
			M		W	
			Parental support	Self-providing	Parental support	Self-providing
Economic support benefit	Yes	n	281	50	235	55
		%	85	15	81	19
	No	n	130	39	176	34
		%	48	52	84	16
	x^2		4.131*		5.058*	
Economic support provision	Yes	n	207	62	249	32
		%	77	23	89	11
	No	n	185	46	190	29
		%	80	20	86	14
	x^2		18.790***		17.103***	
Classification			Matrimonial home			
			M		W	
			Parental support	Self-providing	Parental support	Self-providing
Economic support benefit	Yes	n	263	68	259	31
		%	80	20	89	11
	No	n	146	23	150	19
		%	54	46	71	29
	x^2		0.106		0.091	
Economic support provision	Yes	n	249	20	261	20
		%	93	7	91	9
	No	n	188	43	207	12
		%	81	19	95	5
	x^2		14.010***		16.714***	

Note. M = Men, W = Women, *p<0.1, **p<0.05, ***p<0.01

Eighty five percent of the male subjects and 81% of the female subjects received economic support for their marriage-related expenses from their parents while 85% of the former and 81% of the latter provided for themselves. The chi-squared value was significant, with a 90% confidence level. The matrimonial home purchase cost economic support from the parents was not statistically significant, but the economic support for the marriage-related expenses was. The percentage of men who received marriage-related expenses economic support from their parents was 77%, and the percentage of women who received the same from their parents was 89%. The percentage of men who received matrimonial home economic support from their parents was 93%, and the percentage of women who received the same from their parents was 91%. These results are more statistically significant than the percentages of the men and women who provided for themselves.

Logistic regression was done for the influence factor analysis, with economic support benefit and economic support provision as the dependent variables. These were statistically significant. The results of the influence factor analysis are presented in Table 6.

Table 6. Influence factor analysis

Classification		Economic support benefit			
		M (n=500)		W (n=500)	
		B	Odds ratio	B	Odds ratio
Dependent variable	Economic support benefit (No)	-0.503	0.671	0.108	0.359
	Economic support provision (No)	-	-	-	-
Independent variable	Matrimonial home (Parental support)	0.678	1.059	0.450	1.141
	Marriage cost (Parental support)	-0.033	0.837	-0.021*	0.931
	Childcare support (No)	1.063***	6.517	1.716***	3.145
	Housework (No)	1.821***	5.170	1.347***	4.583
Control variable	Marriage duration	0.008	1.106	-0.313	1.110
	Education level	0.117	1.017	0.230	1.008
	Job	-0.061*	0.515	-0.070*	0.900
	Average monthly income	-0.471***	0.615	-0.381***	0.564
	Family size	-0.171*	0.917	-0.239*	1.001
	Home ownership (No)	-0.061	0.871	-0.058	0.770
	Child (No)	-0.331	1.213	-0.238	1.008
Constant term		1.116	3.870	1.406	5.101
Model x^2		1210.391***		1099.410***	
-2 log likelihood		2010.45		3014.17	
Nagelkerke R^2		0.671		0.717	
Classification		Economic support provision			
		M (n=500)		W(n=500)	
		B	Odds ratio	B	Odds ratio
Dependent variable	Economic support benefit (No)	-	-	-	-
	Economic support provision (No)	-0.506***	0.670	0.091	0.353
Independent variable	Matrimonial home (Parental support)	-0.308***	0.854	-0.235**	0.768
	Marriage cost (Parental support)	-0.129	0.719	0.001	0.871
	Childcare support (No)	-0.180	0.551	-0.019	0.495
	Housework (No)	0.451**	1.708	0.391***	1.047
Control variable	Marriage duration	-0.041	0.881	-0.091	0.003
	Education level	0.147	1.001	0.106	1.081
	Job	-0.017**	0.340	-0.067	1.740
	Average monthly income	0.747***	1.901	0.593***	1.070
	Family size	0.017	1.030	0.131	0.933
	Home ownership (No)	-0.001	0.885	-0.034	0.901
	Child (No)	0.014	0.718	0.003	0.839
Constant term		1.116	-0.671	0.005	-0.443
Model x^2		1210.391***		141.03***	
-2 log likelihood		2010.45		2987.693	
Nagelkerke R^2		0.671		0.070	

Note. M = Men, W = Women, *p<0.1, **p<0.05, ***p<0.01

Two models were interpreted and compared for statistical significance. The two models consisted of the control variables for economic support benefit and those for economic support provision. The number of subjects who received matrimonial home purchase economic support was statistically significant. When matrimonial home support was received from the parents, the economic support provision by the parents increased. This result indicates long-term reciprocity between the parents and their children. Also, the economic support for the marriage-related expenses was found to have had long-term reciprocity and to have been statistically significant. In the economic support benefit model, the childcare, housework, and economic support benefits were statistically significant. In the economic support provision model, housework support was statistically significant. When childcare or housework support was provided by the parents, the probability of the children receiving economic support increased. This means that parents provide their children with various kinds of support. When economic support is provided by the parents, the probability of the parents receiving economic support from their children is low. This means that the reciprocal relationship is not short-term. In the economic support provision model, housework and economic support provision showed a positive relationship. The provision of housework support by the parents increased the probability of their economic support provision to their children. They showed a reciprocal relationship in the short term. The statistically significant variables are as follows. The job, average monthly income, family size, and number of children of the subjects showed a statistically significant relationship with economic support benefit. In the economic support benefit model, the economic

support benefit probability decreased for the male and female subjects who had an occupation, whose average monthly income was high, and who had a large family. The economic support benefit probability increased, however, with childcare support. When the average monthly income was high, the economic support provision probability was also high.

8. Policy Discussion for Addressing the Problem of Excessive Marriage-related Expenses

In South Korea, the major causes of excessive marriage-related expenses are the psychological factor on the part of men and women, the social structural factor, the wrong set of values of the people, the parental psychological factor, the bombastic propaganda of mass media, and the specialized marriage market. The regulation policy of the government is essential for preventing excessive consumption. For instance, in South Korea, the rental house supply has focused on the lower-income group. The newlywed support policy should be expanded to include the provision of economic support to those beyond the lower-income group. Also, the relevant government policy should focus on the provision of rental house supply and house purchase cost economic support for newlyweds. Active support is also needed for the government-led supply of cheap housing. In addition, in South Korea, the societal tendencies are the core factor contributing to the excessive marriage-related expenses. That is, the people want to put their economic status and personal fame on exhibit through conspicuous consumption. The overall efforts of the society are thus needed to be able to address the problem of excessive marriage-related expenses. On the part of the marriage-contracting parties, their efforts are also very important in addressing the aforementioned problem of excessive marriage-related expenses in South Korea. For one, the said expenses should be divided equally between them based on egocentrism and the principle of equality. The contracting parties should also prepare for their future marriage and family expenditures by limiting their daily expenditures. Developing a desirable set of values is very important for marriage. Furthermore, a premarital education program is needed for the marriage-contracting parties and their parents. Small weddings and desirable consumption should be aggressively promoted for the prevention of excessive marriage-related expenses. Couples should also have already worked for more than 10 years before getting married so that they could afford the purchase cost of a house in Seoul.

As mentioned earlier, in South Korea, many young unmarried men and women are avoiding marriage or have decided not to get married at all due to the excessive marriage-related expenses and the very high house purchase cost. The house purchase cost is also the major factor contributing to the indefinite marriage delay. The parents shoulder the house purchase cost for their child, but this threatens the economic stability of the parents in old age. Therefore, the economic dependence of children should be decreased for the sake of the parents. The government should develop and promote an exemplary marriage model. A wedding product and service information comparison system should also be constructed, and public facilities should be utilized as wedding halls.

9. Conclusions

The excessive marriage-related expenses in South Korea have given rise to various other social problems, such as marriage delay, marriage abandonment, and a low birthrate. Job, marriage, and childbirth abandonment have become social buzzwords and serious social problems in South Korea of late. The marriage rate is decreasing and the birthrate is continuously becoming lower due to the indefinite marriage delay or the decision not to get married at all. South Korea has already entered the realm of an aging society due to its low birthrate and increasing aging population. This causes productivity decline and low economic growth through a decrease in the productive population of the country.

The young unmarried men or women in the country generally cannot adequately prepare themselves to shoulder the purchase cost of their house after getting married. Thus, their parents purchase their house for them. In South Korea, the parental support, however, does not end here. If the child requests for economic support after marriage, the parents oblige through economic resource transfer. This has become a serious social problem in South Korea. The number of young unmarried men and women is greatly increasing due to the indefinite marriage delay or the decision not to get married at all owing to the prohibitive cost of getting married. To help their children, parents give up preparing for their old age or secure a loan for their children. The economic support from the couple's parents contributes to the life stability of the newlyweds but threatens the economic stability of the couple's parents in old age. The lack of work and leisure for the country's aged population has also emerged as a social problem.

In this research, 1,000 persons (500 men, 500 women) in Seoul with less than 5 years of marriage were surveyed for excessive marriage-related expenses analysis. The marriage and childbirth trend survey results report (2016) of the Ministry of Gender Equality & Family (MOGEF) of South Korea was utilized for this purpose. The utilized data were extracted as a sample from the population group, through cluster sampling. The research data

were extracted through the framework of sampling in cluster sampling. Logistic regression was conducted for the influence factor analysis. Economic support benefit and economic support provision were the dependent variables, and they were found to be statistically significant. From this it was determined that the parental economic support for the marriage-related expenses has statistically significant long-term reciprocity. In the economic support benefit model, the childcare, housework, and economic support provision were also statistically significant. In the economic support provision model, the housework support provision was statistically significant. That is, when childcare or housework support was provided, the probability of receiving economic support benefit increased. This means that the parents provide their children with various kinds of support.

This paper discusses and presents the policy direction for addressing the problem of excessive marriage-related expenses. It is expected that the proposed policy direction for addressing the problem of excessive marriage-related expenses will contribute to the prevention thereof, and of marriage delay. It is also believed that the policy direction proposed in this paper will have global implications and will be able to help address the problem of excessive marriage-related expenses through research result sharing.

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Abnormal Returns and Fundamental Analysis in Institutional Investors' Decision-making: An Agency Theory Approach

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Abstract

The purpose of this paper is to investigate the abnormal returns achieved by institutional investors. Distinguishing between institutional investors operating with a specific mandate to invest and those that operate their own choices independently from such a specific delegation, we show that the former achieve higher abnormal returns than the latter. The conceptual explanation of this result is attributable to the use of the fundamental analysis that the first type of institutional investors realized in a higher and more effective way than the second. This different approach in selecting securities might be due to the relationship between the institutional investor and the savers who provided capital. This different agency relationship might have been reflected in the institutional investor's investment policies through the agent behaviour, which changes depending on the nature of the principal who has given the mandate. The empirical analysis has been conducted on a sample of 5,500 institutional investors operating all around the world in 2014, drawing data from institutional investor's annual report, from their investment relations and from Bloomberg, Thomson Reuters, Bankscope, Eurostat and through Computer Assisted Telephone Interviews.

Keywords: agency theory, institutional investors, fundamental analysis, abnormal return

1. Introduction

Contractual relations are the heart of all economic activities. Contracts have indeed been the centre of many theoretical analyses since the time of Adam Smith. The reason why the contract is an important tool for understanding economic phenomena, is related to the greater or lesser capacity to regulate relations between subjects who might have different interests and, at the same time, act in a more or less direct and cooperative relationship (Hart, Holmstrom, 2016).

The way in which the behaviour of contractors are brought in to balance will depend on how these contracts, more or less complete or explicit, will be able to regulate the way in which remuneration and risks, arising from property rights, will be allocated among the parts that are normally characterized by divergent interests (Coase, 1937, 1960; Alchian, 1965; Alchian and Kessel, 1962; Demsetz, 1967; Alchian and Demsetz, 1972; Monsen and Downs, 1965; Silver and Auster, 1969; McManus, 1975).

Jensen and Meckling (1976), studying the capital structure, analyzed the behavioural implication of property rights in the contracts. Scholars, questioning about optimal composition of funding sources, defined the agency relationship as a contract by which one or more parties, defined principal, engage another person, called agent, to carry out some work in their interest, involving the reassignment of some authority in terms of decision-making autonomy. Authors state that, in this type of contract, if both parties tend to maximize their own utility function, there are good reasons to believe that the agent does not always behave in the best interests for the principal. For this reason, agency costs may arise and authors lead back them to three categories: monitoring expenditure by the principal, bonding expenditures by the agent and residual loss.

What let arise agency costs is therefore, essentially, the uncertainty, the resulting condition of information asymmetry, actual or perceived, and the attempt to reduce it (Campanella et al., 2013). The principal suffers the uncertainty related to the actions and decisions taken by the agent and the agent suffers the uncertainty regarding the results of his actions. The contracts will be made more complex in order to reduce information asymmetry

and uncertainty that generate the known opportunistic behaviour such as adverse selection and moral hazard.

As claimed by Jensen and Meckling, agency relationships do not occur only at company level but in all relationships that involve cooperative efforts (public offices, governments, cooperatives, etc.).

In addition, the agency relationships are identifiable not only in the simple principal-agent relationship, typical of the relation between a single owner and the manager, but also in cases of widespread ownership.

In addition, the arising of agency costs for the shareholder would not eliminated even in the case in which the firm is partially financed by debt capital.

Even if in this case there are some advantages in terms of control, because of the need to inform the lender of capital about company's capacity to ensure the debt service, there are several possible types of disadvantages for the principal. The indebted company is exposed, in addition to the bonding cost and to the costs of increased reporting, to the risk of bankruptcy. To avoid this risk, and at the same time to safeguard its role in the enterprise, the manager may choose less risky investment projects that ensure the company's survival, reducing the return on equity. On the other hand the cost of capital for an indebted company will be lower than in the case of a company financed only with equity, given that the cost of debt reduces the weighted average cost of capital. Therefore, in such a financial structure, the pressure on higher performance, given by the financial structure, which is inevitably linked to the risk of investment projects, will be less strong than in cases where the company is financed exclusively through equity.

For all these reasons it appears evident that the capital structure will affect in some way the managerial behaviour and, consequently, firm's performance.

A large number of studies on capital structure, having as their object the relationship between corporate governance and financial performances, has shown that the presence of an institutional investor, as an equity holder, is associated with better performance because monitoring by this kind of principal is an important governance mechanism. As noted by Almazan et al. (2004), theory and empirical evidence suggest that active monitoring capabilities are difficult for smaller or less- informed investors (Kaplan and Minton, 1994; Kahn and Winton, 1998; Del Guercio and Hawkins, 1999; Gillan and Starks, 2000; Almazan and Suarez, 2003). Monitoring activities, therefore, is reflected, also and above all, in the fundamental analysis performed by institutional investors in selecting their portfolios and that leads them to realize greater abnormal returns (Campanella, Mustilli, D'Angelo, 2016).

This paper investigates the abnormal returns achieved by institutional investors, distinguishing them according to the more or less specific mandated to invest that has been received by savers who provided them the capital. Therefore we argue that the type of agency relationship explains the more effective use of fundamental analysis and therefore the abnormal return achieved by institutional investors.

The paper falls into four further sections. The first section contains the theoretical framework and the research hypotheses of the study. The second section is dedicated to the methodology and to the description of sample and variables. The third section shows the results of the study and the last section is dedicated to the discussion and to conclusions.

2. Theoretical Framework and Research Hypothesis

According to the Italian Stocks Exchange definition, institutional investors are classified as follows: collective investment companies, investment funds (real estate, stocks and hedge funds), pension funds and insurance companies.

The investing activity carried out by such institutional investors can derive from an explicit mandate given by savers, therefore the investment is done on a collective basis, as in mutual funds, or may be disjoined from the saver's invested capital, as in the case of insurance companies. Therefore, for the purposes of our research, it is possible to identify two distinct categories of institutional investors:

1) Institutional investors whose activity is derived from an explicit and detailed contract, so the investment is made on a collective basis, as in mutual funds. In this case the mandate comes from savers who are fully aware of the market risk derived from the investment activity made by the fund. The willingness of the saver is to invest in the financial market and the mandate details the investment strategies that will be used by the fund. In this case savers delegate the professional institutional investor to carry out an investment activity on their behalf. Institutional investors who fall into this category are following named "Banks".

2) Institutional investors whose investing activity is not linked to a specific mandate given by the savers, as in the case of insurance companies. In this case, the institutional investor operates without a specific mandate, with

a greater freedom in choosing their investment strategies. Institutional investors who fall into this category are following named "Insurance Companies".

Essentially, moving from the position of the saver, we will have two possible solutions: indirect investment through a vehicle (Banks) or direct investment (insurance companies), as shown in the example described in the figure 1

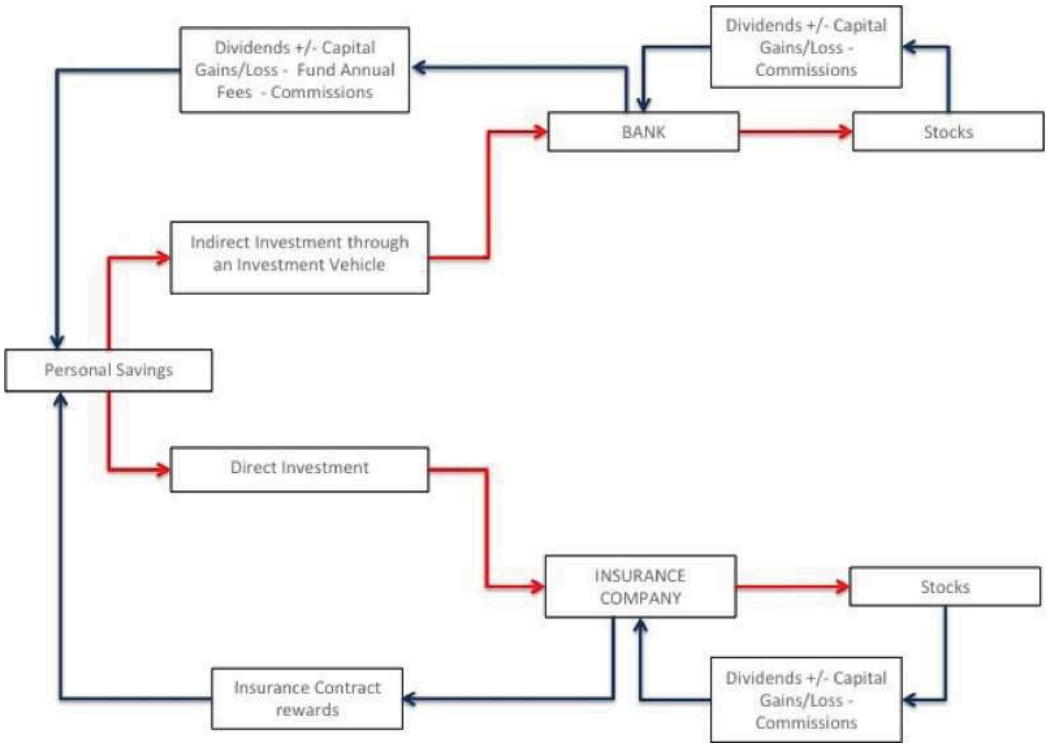

Figure 1. The flow of capital and rewards in the case of specific mandate or non-specific mandate

In the first case (Bank), money flows directly into an investment vehicle that employs it in the purchase of stocks. The compensation provided by the investment made by the vehicle, typically dividends and capital gains, net commissions paid for purchasing operations and any capital losses, will coincide with the return of the investor, net fund's management fee that will be held periodically by the fund.

In the other case, the saver will sign a contract with the Insurance Company and its remuneration is essentially described in the contract. Money given by the savers to the Insurance Company will be, in the end, partly invested in shares, but this time the remuneration arising from such purchase of shares will be only a prerogative of the Insurance Company that has invested and not any more given to the personal saver.

Therefore, in both cases, the money provided by the savers may be finally invested in a portfolio of shares, but, in the case of Bank, saver's reward is tied to the investment in shares, while, in the second case, the one of the Insurance Company, the remuneration taken by the saver will be linked to another contract and therefore will be independent from the share's equity return on investment.

From a theoretical point of view, the difference between the two cases taken into consideration is mainly connected to the different type of multiple agency relationships that arises along the investment chain. These differences will push the Bank, unlike the Insurance Company, to adopt fundamental analysis in their portfolio selection and, thanks to this approach, to achieve higher abnormal returns. This condition will guarantee both a higher return in terms of fees and a higher reputation for the institutional investor.

Two different positions may arise according to agency theory. In the case of Banks, the position of the saver who gave money to the institutional investor, with a binding mandate to invest in shares, is equivalent to the one of a minority principal, while in the case of Insurance Companies, the position of the saver that gave money to the institutional investor is equivalent to the one of a debt holder.

The next step of the investing flow chain regards the contractual relationship between Bank and Insurance in relation to the targeted company. The institutional investor positions, that we have defined Insurance on one hand and Bank on the other, in this case are rather similar. For both solutions, a typical position of principal-agent

relationship may arise.

Therefore, in order to demonstrate our theoretical framework, it is not necessary to concentrate on the agency relationship that binds the second part of the investment chain (principal-agent), in other words the one through which Bank and Insurance Company are linked to targeted company, but to the first relationship, which links the saver and the institutional investor that invests in target (figure 2).

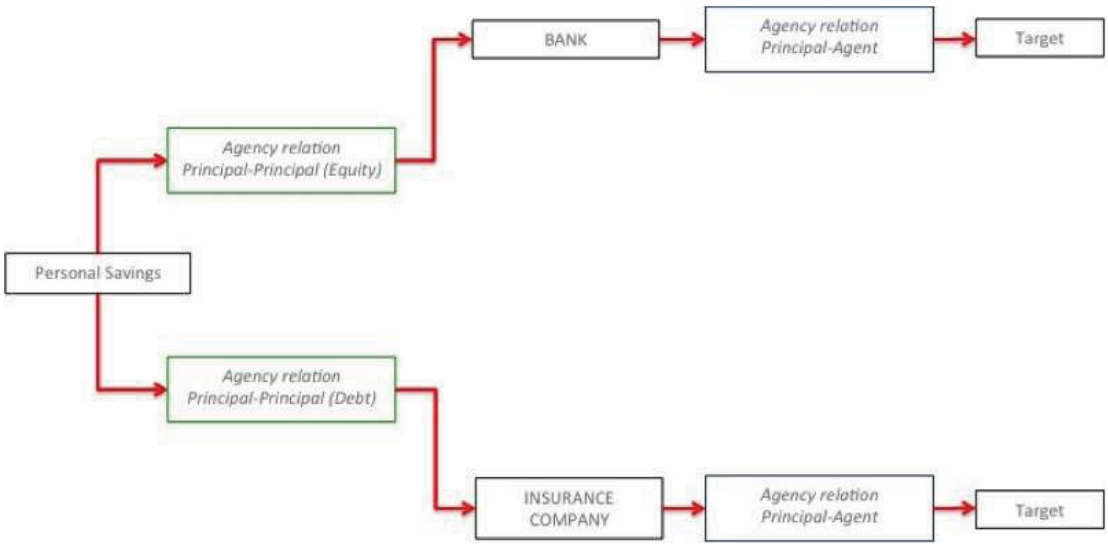

Figure 2. Agency relationships in the investing chain

If the relationship between the saver and the institutional investors were the same, there will be no different results in terms of abnormal returns gained by the target stocks, since there would be no difference in the way in which the management of Bank and Insurance Company would elaborate their investment policies. Conversely, since the capital structure is different, this may result in influencing the management of the two type of institutional investors when it comes to their portfolio selection.

More in detail, the agency relationship associated with debt (Insurance Companies) leads to a higher cost of monitoring held by the investment company. In this condition, the investor will face, on one hand, the monitoring costs for the equity holders and, on the other, will incur into bonding costs.

It is clear that a capital structure that includes a financial debt (which is guaranteed by an insurance benefit) will have a weighted average cost of capital lower than in the case of an investor exclusively financed by an equity holder. The risk of bankruptcy will also lead the institutional investor to select stocks characterized by a lower risk-return trade off. The costs arising from the additional monitoring arising from debt, will have the effect of consuming cash flows that otherwise would be used to run a highly cost consuming fundamental analysis on target stocks. Conversely, the principal-principal relationship, typical of the relationship between savers and Bank, pushes the latter, characterized by a higher cost of capital, lower agency costs and the absence of the bankruptcy risk, to use fundamental analysis in the composition of its securities portfolio, taking higher risks in terms of risk-return trade off and thus to outperform in terms abnormal returns.

This leads us to the following hypotheses:

H1: Institutional investors with a specific mandate of investors (Banks) show abnormal returns higher than the other (Insurance Companies).

H2: Institutional investors with a specific mandate of investors (Banks) use fundamental analysis in formulating their investments strategies.

3. Materials and Method

The sample used in this research is made of 5,500 institutional investors located all over the world and is composed of 2.645 institutional investors named as “banks” and 2.855 institutional investors named “Insurance Companies” as described in section number one of the paper.

To verify the research hypotheses, we employed the classification analysis method. The classification rule for a research sample has to be defined before building the classification tree (Andone and Sireteanu, 2009). The

classification rule for this research is to make the distinction between "Banks" and "Insurance Companies". This classification rule is reflected in the Y variable for the classification tree. Variable Y has been structured as follows:

Y = is a dummy variable which assumes value 0 or 1 depending if the institutional investor is a "Insurance Company" or a "bank".

At this point, a recursive partition technique was applied to assign each statistical unit to one of the classes defined a priori by Y. The sample units were repeatedly split into groups, which were increasingly more homogeneous with respect to the dependent variable Y. The splitting procedure was conducted with reference to the explanatory variables $X=(X_1, X_2,\ldots, X_s,\ldots,X_p)$.

In line with the aim of their research, the authors had to define the variables (X) that have a bearing on "Bank" and "Insurance".

Accordingly, we defined the following independent variables:

- Abnormal returns$_t$ = r - E(r); where: r = portfolio return at time t; E(r) = portfolio expected return at time t-1. The abnormal return has been measured through the difference between the portfolio's effective return and the expected return measured using the "market model". The effective return has been measured as follows: r = Log (P_t / P_{t-1}) where: P_t = price of the security at time of dividend announcement; P_{t-1}= price of the security at time t-1. The expected return has been measured as follows: $E(r) = \alpha_J + J_{j,mrm} + \sigma_J$ where: a_j = Jensen's a; $J_{j,m} = Cov_{j,m} / Var_m = (o_j\, o_m\, q_{j,m})/ o_m^2$; r_m = daily index of the reference market. The variable takes value 1 if r – E(r) > 0 and 0 otherwise.

- (D_{t-1} / E_{t-1}) = (Book value of the indebtedness$_{t-1}$ / Book value of equity$_{t-1}$). This variable reflects the leverage of the firm concerned and is a proxy of the financial risk. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- EPS_{t-1} = earnings per share at (t-1) = (After-tax profit$_{t-1}$ / Number of shares$_{t-1}$). This variable reflects the profit that was distributed to the shareholders in the form of dividends and capital gains for each share held by each of them. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- ROE_{t-1} = Return on equity (t-1) = (After-tax profit$_{t-1}$ / Equity$_{t-1}$). This variable reflects the book value of the returns accruing to shareholders. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- Current ratio$_{t-1}$ = (Current assets$_{t-1}$ / Current liabilities$_{t-1}$). This variable indicates whether the amount of the assets that will be recovered in cash within the year exceeds the amount of the debt to be repaid over the same period of time. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- (NFP_{t-1} / Total assets$_{t-1}$) = (Net financial position$_{t-1}$ / Total book value of assets$_{t-1}$). This variable indicates the proportion of the company's investments that was financed with borrowed funds and, hence, illustrates the composition of its sources of funds. The net financial position is defined as debt minus liquid assets. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- ($EBIT_{t-1}$ / Financial expenses$_{t-1}$) = (Earnings before interests and taxes$_{t-1}$ / Financial expenses$_{t-1}$). This variable reflects the part of the costs of its financial resources that the firm is able to finance out of its own earnings before interest and taxes. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- (P_{t-1} / E_{t-1})= (Market cap$_{t-1}$ / Net earnings$_{t-1}$). This variable measures the number of years over which the monetary value of the price is recovered if the security concerned generates a theoretically perpetual flow of annual net earnings of the level postulated at the time of the measurement. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- (P_{t-1} / Cash flow$_{t-1}$) = (Market cap$_{t-1}$ / Cash flow$_{t-1}$). This variable measures the number of years over which the monetary value of the price is recovered if the security concerned generates a theoretically perpetual cash flow. This multiple can effectively help solve the greatest shortcoming of the P/E ratio, i.e. the fact that the net earnings of a company are dependent on its budget policies. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- (P_{t-1} / Sales$_{t-1}$) = (Market cap$_{t-1}$ / Sales$_{t-1}$). This variable measures the number of years over which the value

of the price is recovered if the security concerned generates a theoretically perpetual cash flow. It is especially useful to evaluate the performance of start-ups, since these are firms that due to substantial front-end investments tend to operate at a loss. Considering that it would hardly make sense to determine their P/E ratios and the fact that the primary aim of a firm is to boost its sales, it is interesting to establish what chances the market is prepared to take on their prospective sales potential. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- (P_{t-1} / BV_{t-1}) = (Market cap_{t-1} / Book $Value_{t-1}$). This variable indicates the ratio between the market value of equity and the book value of it. This variable takes the value 1 if the institutional investor has used a high level of this variable as choosing criteria for the targeted company.

- Size $Effect_{t-1}$ = A variable which measures the sizes of the firms and is equal to the book value of the firm's total assets. This variable takes the value 1 if has been used by the institutional investor as choosing criteria for the targeted company.

- Industry = A variable which measures the industry in which the firms conducts the business. This variable takes the value 1 if has been used by the institutional investor as choosing criteria for the targeted company.

- GDP = It reflects the growth rate of the real GDP (Real Gross Domestic Product) of the country in which the institutional funds conducted their operations. This variable takes the value 1 if has been used by the institutional investor as choosing criteria for the targeted company.

- Inflation = It reflects the mean inflation rate of the country where the institutional funds were operating in 2012-2013. This variable takes the value 1 if has been used by the institutional investor as a choosing criteria for the targeted company.

The figures used for this research were collected from annual report, investment relations, Bloomberg, Thomson Reuters, Bankscope and Eurostat. Moreover, the dataset has been enriched by data resulting from 7,845 interviews (70,11% response rate) conducted, via CATI system, in 2013 to banks and insurance managers, in order to get information concerning their investing strategies. The sample of 5,500 institutional funds is progressively split into smaller and smaller partitions with increasing internal homogeneity in terms of the dependent variable. Using the CART (Classification And Regression Tree) each segmentation (called node) is characterized by a high level of homogeneity because of the application of Gini index. In this study the minimum rate of Gini Index is 0.0001.

A terminal node is described as "pure" when the value of the dependent variable is the same for 100% of the cases in the node. In other words, based on the CART procedure, the database was split into ever more Y-homogeneous subsets (Campanella, 2014).

CART is widely held to be particularly suited to empirical studies (Olshen et al., 1984; Campanella, 2014; Del Giudice et al., 2016; Campanella et al., 2016; Campanella et al., 2016; Brida et al. 2009; Brida et al. 2010) for many reasons. First of all, it offers the chance of using both qualitative and quantitative dependent variables; second, the data set can be split using combinations of quantitative and qualitative variables as predictors and the splitting criterion itself is defined by minimizing the impurity level of a node. Finally, the algorithm can be used to prune large-size trees down to optimal dimensions (Razi & Athappilly, 2005).

According to these characteristics, this method is particularly suitable for our purposes because of the presence of qualitative and quantitative variables.

Lastly, CART method allows the possibility to conduct robustness tests splitting the dataset in training sample (60%) and test sample (40%).

The overall efficiency of the proposed model was evaluated by the Receiver Operating Characteristic Curve (ROC Curve).

4. Results and Discussion

The model specifications and the results of our analysis are given in Table 1. The section on 'Specifications' provides information on the criteria for building the tree model, including the analysed variables, whereas the values reported in the section on 'Results' gives the number of aggregate nodes, the number of terminal nodes and the tree depth.

Table 1. Model summary

Specifications	Growing Method	CRT
	Dependent Variable	Bank_Insurance
	Independent Variables	Size, NFP_Asset, Inflation, P_E, Abnormal_return, GDP, EBIT_Financial, P_Cash, P_BV, Industry, EPS, ROE, Current_ratio, D_E
	Validation	Split Sample
	Maximum Tree Depth	5
	Minimum Cases in Parent Node	100
	Minimum Cases in Child Node	50
Results	Independent Variables Included	Abnormal_return, NFP_Asset, P_E, Current_ratio, D_E, Industry, ROE, Inflation, EPS, Size, EBIT_Financial, GDP, P_Cash, P_BV
	Number of Nodes	21
	Number of Terminal Nodes	11
	Depth	5

We initially identified fifteen independent variables. All variables were included in the model. Figure 1 shows the tree diagram of the training sample at the end of the pruning process. The optimal sub-tree is shown in Figure 3. The 'Abnormal return' variable splits the data into two nodes, node 1 and node 2. Data show that node 1 has a composition of 76.8% of Banks and 23.2% of Insurance (this means that 77.6% of banks have a positive abnormal return and 21.4% of insurance have a positive abnormal return), while node 2 displays a composition of 79.4% of Insurance and 20.6% of banks (this means that 22.4% of banks have a negative abnormal return and 78.6% of insurance have a negative abnormal return).

The subsequent best classification variable for funds in node 1 is leverage (node 3). Data show that node 3 has a composition of 85.8% of Banks and 14.2% of Insurance (this means that 83.8% of banks and 46.0% of insurance, which achieved a positive abnormal return, choose an higher leverage).

Another best classification variable is ROE (node 7). Data show that node 7 has a composition of 92.4% of Banks and 7.6% of Insurance (this means that 90.0% of banks and 45.0% of insurance, which achieved a positive abnormal return and a high leverage, choose an higher ROE).

Finally, funds with lower abnormal return than other funds are classified in node 2. The subsequent best classification variable of node 2 is node 6, which has the following composition: 87.4% insurance and 12.6% banks. This means that 85.2% of the insurance and 47% of the banks with negative abnormal return doesn't use the return of equity as a discriminatory variable.

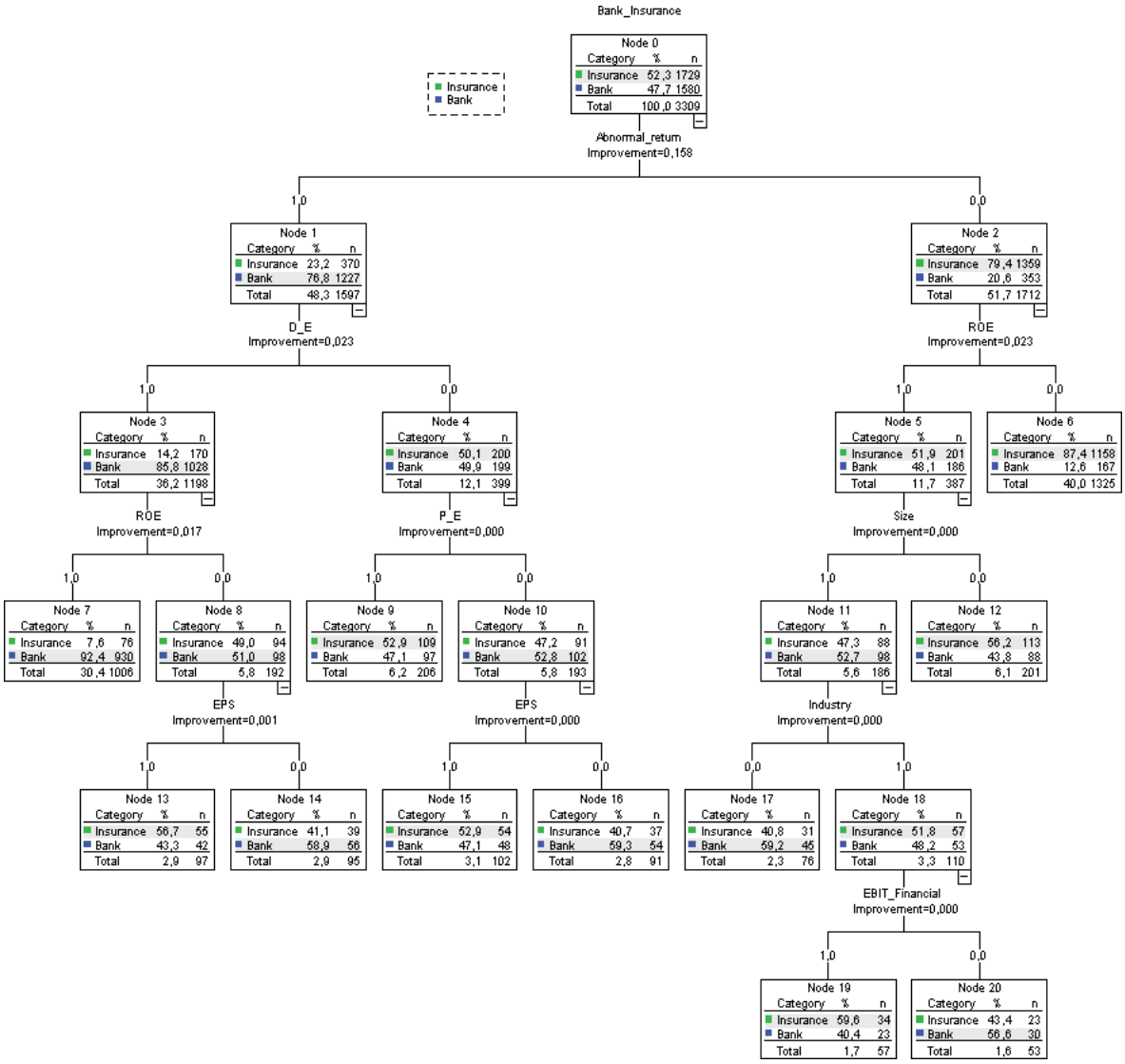

Figure 3. Training sample

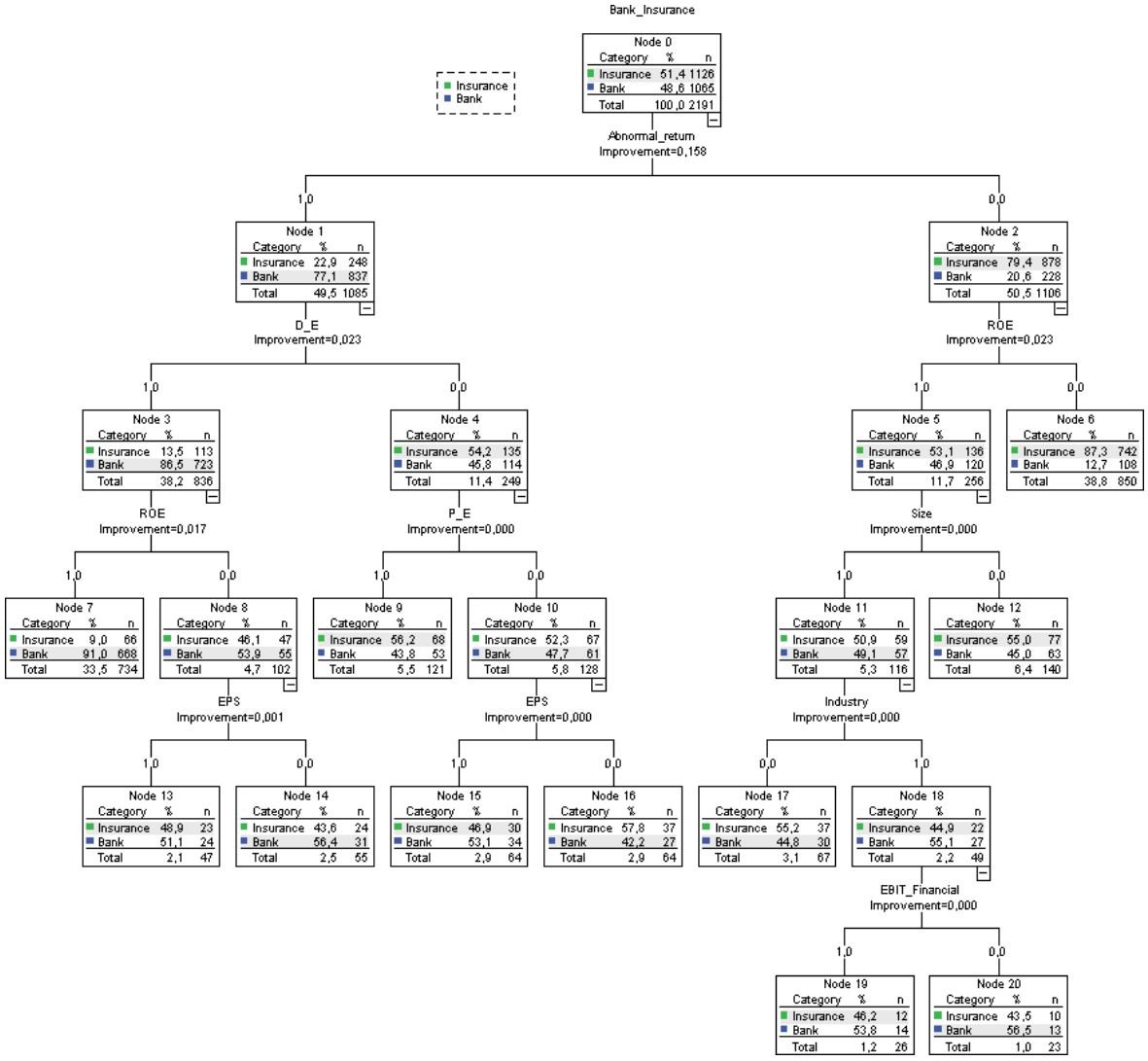

Figure 4. Test sample

The Risk and Classification Tables (Tabs 2 and 3) show that the classification error risk rate of the model is 20.3% with a 0.007 standard error value and that the correct classification rate obtained for the training sample is 79.7%.

Table 2. Risk

Sample	Estimate	Std. Error
Training	0.203	0.007
Test	0.215	0.009

Growing Method: CRT - Dependent Variable: Bank_Insurance

Table 3. Classification

		Predicted		
Sample	**Observed**	**Insurance**	**Bank**	**Percent Correct**
Training	Insurance	1523	206	88.1%
	Bank	465	1115	70.6%
	Overall Percentage	60.1%	39.9%	79.7%
Test	Insurance	952	174	84.5%
	Bank	296	769	72.2%
	Overall Percentage	57.0%	43.0%	78.5%

Table 4 summarizes the gain for nodes and shows the number of nodes, the number of cases, the average profit and ROI (Return on Investment). Node 7 performs best, node 6 worst.

Table 5 refers to the target variable "Bank" and it includes the gain in percentage, the response rate and the percentage index (lift) per node.

Figures 3 and 4 illustrate their relative node performance compared to the gain and the index. In Figure 3, the gain chart increases rapidly towards 100% then falls along the diagonal. This graph indicates that the model is quite reliable. It can be seen that a model that does not provide information follows the baseline of the diagonal.

In Figure 5, the cumulative indexes plots tend to start above 100% and gradually decrease until they reach 100%. This graph shows that the model is reliable. Indeed, in a reliable model, the value of the index starts well above 100%, and then rapidly drops to 100%. For a model that does not provide information, the line will overlap the 100% line for the whole chart.

Table 4. Gain Summary for Nodes

Sample	Node	N	Percent	Profit	ROI
Training	7	1006	30,4%	4,471	5,0%
	16	91	2,8%	2,154	3,5%
	17	76	2,3%	2,145	3,5%
	14	95	2,9%	2,126	3,5%
	20	53	1,6%	1,962	3,3%
	9	206	6,2%	1,296	2,5%
	15	102	3,1%	1,294	2,5%
	12	201	6,1%	1,065	2,2%
	13	97	2,9%	1,031	2,2%
	19	57	1,7%	,825	1,8%
	6	1325	40,0%	-1,118	-5,0%
Test	7	734	33,5%	4,371	5,0%
	16	64	2,9%	,953	2,0%
	17	67	3,1%	1,134	2,3%
	14	55	2,5%	1,945	3,3%
	20	23	1,0%	1,957	3,3%
	9	121	5,5%	1,066	2,2%
	15	64	2,9%	1,719	3,1%
	12	140	6,4%	1,150	2,3%
	13	47	2,1%	1,574	2,9%
	19	26	1,2%	1,769	3,1%
	6	850	38,8%	-1,111	-4,9%

Growing Method: CRT - Dependent Variable: Bank_Insurance

Table 5. Target category: Bank – Gain for Nodes

		Node		Gain			
Sample	Node	N	Percent	N	Percent	Response	Index
Training	7	1006	30,4%	930	58,9%	92,4%	193,6%
	16	91	2,8%	54	3,4%	59,3%	124,3%
	17	76	2,3%	45	2,8%	59,2%	124,0%
	14	95	2,9%	56	3,5%	58,9%	123,5%
	20	53	1,6%	30	1,9%	56,6%	118,5%
	9	206	6,2%	97	6,1%	47,1%	98,6%
	15	102	3,1%	48	3,0%	47,1%	98,6%
	12	201	6,1%	88	5,6%	43,8%	91,7%
	13	97	2,9%	42	2,7%	43,3%	90,7%
	19	57	1,7%	23	1,5%	40,4%	84,5%
	6	1325	40,0%	167	10,6%	12,6%	26,4%
Test	7	734	33,5%	668	62,7%	91,0%	187,2%
	16	64	2,9%	27	2,5%	42,2%	86,8%
	17	67	3,1%	30	2,8%	44,8%	92,1%
	14	55	2,5%	31	2,9%	56,4%	116,0%
	20	23	1,0%	13	1,2%	56,5%	116,3%
	9	121	5,5%	53	5,0%	43,8%	90,1%
	15	64	2,9%	34	3,2%	53,1%	109,3%
	12	140	6,4%	63	5,9%	45,0%	92,6%
	13	47	2,1%	24	2,3%	51,1%	105,1%
	19	26	1,2%	14	1,3%	53,8%	110,8%
	6	850	38,8%	108	10,1%	12,7%	26,1%

Growing Method: CRT - Dependent Variable: Bank_Insurance

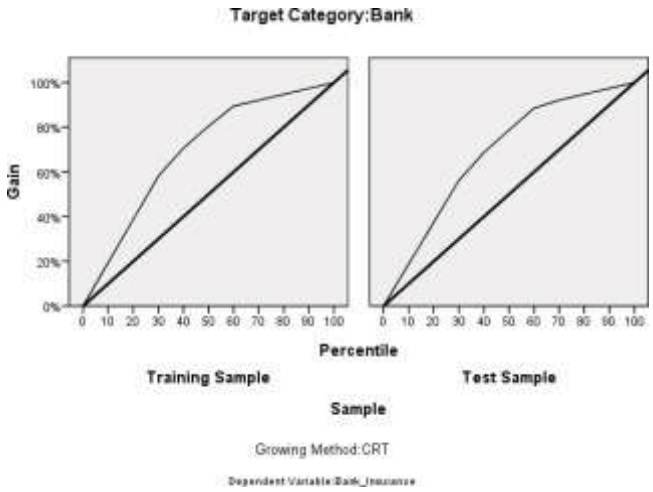

Figure 5. Target category: Bank – Node performance: gain

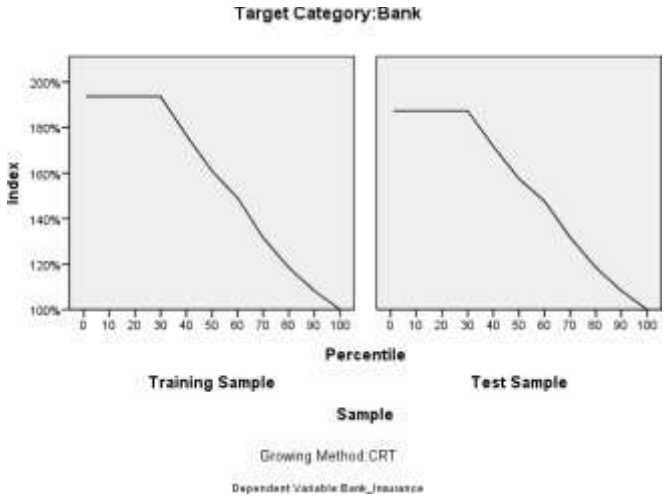

Figure 6. Target category: Bank – Node performance: index

The overall efficiency of the optimal tree was evaluated through the Receiver Operating Characteristic Curve using the predicted probability of the model (Table 6, Table 7 and Figure 7).

Table 6. Case Processing Summary

ROI	Valid N (listwise)
Positive	2645
Negative	2855

Notes: Larger values of the test result variable(s) indicate a stronger evidence for a positive actual state; (a.) the positive actual state is Bank.

The Area Under the Curve (AUC) in Figure 5 is equal to 0.863. The best cut off is at 0.5185

(Youden's index = 0.579) (Table 7 and Table 8).

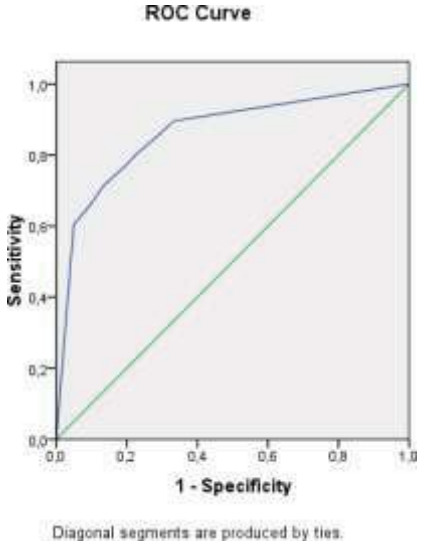

Figure 7. ROC Curve

Table 7. Area Under the Curve (AUC)

Area	Std. Error[a]	Asymptotic Sig.[b]	Asymptotic 95% Confidence Interval	
			Lower Bound	Upper Bound
0.863	0.005	0.000	0.853	0.873

Notes: Predicted Probability for Bank_Insurance=1 has at least one link between the positive actual state group and the negative actual state group. Statistics may be biased; (a.) Under the nonparametric assumption; (b.) Null hypothesis: true area = 0.5

Table 8. Coordinates of the curve

Positive if Greater Than or Equal To[a]	Sensitivity	1 - Specificity
,0000	1,000	1,000
,2648	,896	,335
,4182	,882	,318
,4354	,857	,291
,4542	,800	,225
,4707	,769	,195
,5185	,712	,133
,5778	,696	,122
,5908	,663	,099
,5928	,635	,076
,7589	,604	,050
1,0000	,000	,000

Notes: Predicted Probability for Bank_Insurance=1 has at least one link between the positive actual state group and the negative actual state group; (a.) The smallest cut-off value is the minimum observed test value minus 1, and the largest cut-off value is the maximum observed test value plus 1. All the other cut-off values are the averages of two consecutive observed test values.

The study show that institutional investors that operate under a specific mandate (Bank) achieve higher abnormal returns, therefore Hypothesis H1 is confirmed.

Moreover the model show that institutional investors classified as "bank" uses data given by the fundamental analysis in choosing their stocks. The level of financial leverage and the return on equity seem to be the main parameters used by the best performer in choosing their portfolios. This may lead us to confirm Hypothesis H2.

5. Conclusion

The objective of the article was to verify whether institutional investors with a specific mandate to invest realize or not superior performance compared to those who do not have a specific mandate and if this outcome is the result of the use of fundamental analysis for the selection of their portfolios. Since both hypotheses are confirmed, it seems appropriate to proceed with further specifications about the results achieved, also in the light of the theoretical framework described in the previous section of the article.

First it is appropriate to analyse portfolios that achieved returns higher than expected. It is confirmed that institutional investors operating under a specific mandate to invest, in most cases, gain superior performance. This may be attributable to the use of fundamental analysis in guiding their investment decisions. More in detail it was found that the use of some specific variable is able to better discriminate portfolios which have performed better than others.

The research shows that two variables have been decisive in discriminating the performance of institutional investors who have better performed: roe and financial leverage.

When an institutional investor selects a target company characterized by a high degree of financial leverage, this may result in exposing the investor to a higher level of risk: the financial risk. This is consistent with the second proposition of the Modigliani-Miller theorem concerning the financial structure. It is clear that the actual return is not necessarily consistent with what was expected at the time of investment and neither with what has been achieved in the past by the targeted company. However, it was found that the return on equity was the second variable that discriminates investments characterized by abnormal returns from the others.

This suggests that institutional investors with a higher risk propensity, in their portfolio selection, evaluate the consistency between the higher financial risks the returns that the targeted company has been able to achieve in the past. Selecting securities with a high level of leverage and high return on equity is a symptom of the willingness of the institutional investor to evaluate the target company's ability to successfully use financial leverage. In other words is the indicator of the ability of the firm to catch the increasing in the return on equity that follows a high degree of leverage when there are positive differentials between the operating income returns and the cost of borrowed funds.

This confirms what was suggested in the theoretical framework that led us to the formulation of research hypotheses. Institutional investors operating under a specific mandate to invest, not being subject to additional monitoring costs, have superior financial resources to use for fundamental analysis. In addition, using such a tool, they prefer to expose themselves to higher risk-return trade off with the aim of achieving higher returns. On the contrary, institutional investors that operate in the absence of a specific mandate to invest, realize, in most cases, lower returns compared to those expected. These kind of institutional investors mostly don't use fundamental analysis in selecting their target companies, because they can't sustain both the cost of fundamental analysis and the bonding costs related to the financial debt. Moreover, the cash flow expected by the Insurance Companies are lower, as a result of a lower risk- return trade off preferred by this type of investor in order to ensure the sustainability of debt and the corporate survival.

In conclusion, it is necessary to highlight the contribution of this research to the existing literature and its limitations. First of all, the research highlights the importance of having distinguished institutional investors according to the mandate received by savers. This classification, compared to previous research, allows to assess the implications of the mandate on the performance achieved in terms of abnormal returns. Secondly, this research allows us to examine the fundamental analysis role in determining the abnormal returns. With regard to this second point it has revealed that the financial leverage effect has an important role in discriminating investment, which achieved higher abnormal returns. Further research strengths are the theoretical framework associated with the contractual requirements that discriminate institutional investors depending on their relationship with the savers and an original methodology.

Obviously this article has limitations that could be overcome through further study, for example with a longitudinal analysis over a longer period of time, or taking into account the territorial peculiarities of investment funds or the ones of the target companies.

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Forward Unbiasedness in the Short End of the Interest Rate Market

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Abstract

Forward rate unbiasedness postulates that the forward rate is an unbiased estimator or predictor of the future spot rate. This case of risk neutrality has been tested extensively especially in the foreign exchange market. This paper departs from this line of research and studies unbiasedness at the short end of the interest rate market. Although, a priori, an investment of 6 months and an investment of three months rolled over for an additional 3 months are commonly believed to be riskless at first approximation, our results show otherwise. The precision of our estimators unveil a small but statistically significant risk premium. The latter has two components, a constant risk premium and a time-variable one. The constant risk premium is estimated to be 14.4 basis points. The time-variable risk premium ranges between a maximum of 184.6 basis points, and a minimum of -123.2 basis points, and averages 5.4 basis points. The methodology in this paper is amenable and adaptable, with little adjustments, to other maturities. This is an agenda for the future.

JEL Codes: E43, G12, G14, C22

Keywords: unbiasedness, short term, interest rate market, neutrality, risk

1. Introduction

The expectations theory of the term structure of interest rates is known at least since the 1930s (Fisher, 1930; Keynes 1930). In its "pure" form it states that the long interest rate is an average of expected short term interest rates. This implies that the forward rate is an unbiased predictor of the future rate. This has also been called forward market efficiency. The basic tenet is that there is no risk premium, whether constant or time-variable. Unfortunately the unbiasedness of interest rates has not been researched well enough. Most studies apply the expectations theory on currency markets (see the references below). This paper will test forward market efficiency in the interest rate market, specifically between an investment for 6 months and an investment for 3 months, i.e. between the 6-month US T-bill rate and the 3-month US T-bill rate. Since the data is overlapping the residuals from a regression of the forward rate on the expected future rate are auto-correlated. As Verbeek (2012) suggests, a way out of this problem is to apply Newey-West heteroscedasticity and autocorrelation (HAC) standard errors and covariance.

The expectations theory states that the long rate is proportional to the equally weighted expected series of short term rates, where E_0 is the expectation operator for the information set at time 0 (i.e. today) (Azar, 2018):

$$1 + rl_k = \left[(1 + rs_0)\left(1 + E_0(rs_1)\right)\left(1 + E_0(rs_2)\right)\left(1 + E_0(rs_3)\right) \dots \left(1 + E_0(rs_{k-1})\right)\right]^{1/k} \quad (1)$$

$$= (1 + rs_0)\left[\prod_{j=1}^{k-1}\left(+E_0(rs_j)\right)\right]^{\frac{1}{k-1}} \quad (2)$$

where rl_k is the long rate with a maturity k, and rs_t is the short rate with maturity $1 < k = an\ integer$. If rs is a random walk, then $E_0(rs_j) = rs_0$, for $j = 1 \rightarrow (k-1)$, and equations (1) and (2) become (with conditionality):

$$E_0(rl_k) = ([1 + rs_0][1 + rs_0]^{k-1})^{1/k} - 1 = rs_0 \Rightarrow rl_k = rs_0 + \epsilon \quad (3)$$

where ϵ is a stationary white noise process, having a mean of zero, if the pure expectations theory holds, and

having a mean θ if there is a stationary and constant risk or liquidity premium, and having a mean of θ_k if the premium depends on the maturity k. Other forms of premiums are also consistent with the equation. For example, the value θ_k can be time-variable, and possibly auto-correlated.

Equation (3), which states that the spread between long and short rates is stationary in distribution, has been tested by Campbell and Shiller (1987), Shiller (1989), Campbell and Shiller (1991), Choi and Mohar (1991), Hall et al. (1992), Hejazi et al. (2000), Longstaff (2000), Bekaert and Hodrick (2001), Thorton (2005, 2006), Konstantinou (2005), Sarno et al. (2007), Mills and Markellos (2008), Suardi (2010), Finlay and Jones (2011), and Strohsal and Weber (2014) with mixed results. Most papers find that the highly reputable expectations theory does not deserve its renown.

Usually equation (1) is linearized, by assuming $log(1+x) \approx x$ for small x near zero, or else continuously compounded interest rates are utilized:

$$[log(1+rl_k)] = log\left[(1+rs_0)\left(1+E_0(rs_1)\right)\left(1+E_0(rs_2)\right)\dots\left(1+E_0(rs_{k-1})\right)\right]^{1/k} \approx rl_k$$

$$\approx (1/k)(rs_0 + E_0 rs_1 + E_0 rs_2 + \cdots + E_0 rs_{k-1})$$

After that, rs_o is brought to the left hand side of the equation resulting in the following specification (with conditionality):

$$E_0(rl_k - rs_0) = \frac{1}{k} E_0\left[\sum_{i=1}^{k-1}\sum_{j=1}^{j=i} \Delta rs_j\right]$$

If rs is a random walk then the above collapses to:

$$rl_k - rs_0 = \epsilon$$

where ϵ is a stationary white noise process having a mean zero, if the pure expectations theory holds, having a mean of θ if there is a stationary and constant risk or liquidity premium, and having a mean of θ_k if the premium depends on the maturity k. Other forms of premiums are also consistent with the equation. For example, the value θ_k can be time-variable, and possibly auto-correlated.

The paper is organized as follows. In the next section, section 2, the theory is presented and analyzed. The section includes some recent literature on the unbiasedness hypothesis. Section 3 is the empirical part. The last section summarizes and concludes.

2. Theory

We denote by F_t the forward interest rate calculated at time t for a maturity that starts at time $t+1$, equal to 3 months, and that matures at time $t+2$, i.e. in 6 months. Let S_{t+1} be the actual yield, i.e. the quarterly T-bill rate, that will be observed in 3 months, and let the expectation operator be E_t for the information set at time t, i.e. today. Then in case of risk neutrality and no arbitrage:

$$E[S_{t+1}] = F_t \Rightarrow S_{t+1} = E[S_{t+1}] + \epsilon_{t+1} = F_t + \epsilon_{t+1} \quad (4)$$

The last term on the right-hand side of equation (4) is akin to a simple regression with an intercept equal to zero, and a slope equal to +1. If there is a constant risk premium ρ then we have (Fama, 1984):

$$E[S_{t+1}] - \rho = F_t \Rightarrow S_{t+1} = F_t - \rho + \epsilon_{t+1} \quad (5)$$

In case the risk premium has two components: a time-variable premium and a constant risk premium, then we have:

$$E[S_{t+1}] - \rho_t - \alpha = F_t \Rightarrow S_{t+1} = -\alpha + F_t - \rho_t + \epsilon_{t+1}$$

This is equivalent to:

$$S_{t+1} - F_t = -\alpha - \rho_t + \epsilon_{t+1}$$

The time-variable risk premium is assumed to be known at time t. If not the ex post time-variable risk premium ρ_{t+1} will replace ρ_t. In addition if ρ_{t+1} is forecastable we will replace ρ_t by $E_t(\rho_{t+1})$. As a matter of fact ρ_{t+1} will be found to be predictable by a parsimonious Box-Jenkins ARMA model. Finally, if there is a time-variable risk premium that is correlated with the forward rate, then we have:

$$S_{t+1} = -\alpha + \beta F_t - \rho_t + \epsilon_{t+1} \quad \text{with} \quad \beta > 0$$

Testing forward rate unbiasedness, or in other terms forward market efficiency, has benefited strongly from the advent of cointegration techniques. At the same time data on foreign exchange rates and forward exchange rates

became available and cleaner. For the literature before the advent of cointegration the reader is referred to MacDonald (1988). The new cointegration techniques allowed a shift of the research from being a regression of the expected depreciation on the forward premium, or on the interest rate differential, to a regression in log-levels whereby the log of the level of the future spot rate is checked for cointegration with the lagged forward rate. Initially the econometric results were supportive of the unbiasedness hypothesis (Baillie and Bollerslev, 1989). The tests by these authors are relatively robust since they use pooled or panel data which multiplies the degrees of freedom and avoid small sample bias. Other authors found a bias in the forecast equation which forces the intercept to be zero and the slope to be +1. However, lately the literature has shifted to two new specifications for the risk premium to explain the bias. One specification is non-linearities in the deviation from Uncovered Interest Parity[1] (UIP) (Sarno et al., 2006), or the presence of endogenous structural breaks (Hatemi-J and Roca, 2012), or the parting of the variables between permanent and transitory components (Al-Zouby, 2010). Another approach is to test a joint hypothesis whereby the contemporaneous spot rate is cointegrated with the forward rate, and the other whether the forward rate is an optimal predictor of the future spot rate. The former hypothesis is implied by the random walk behavior of the spot exchange rate (McMillan, 2005). Finally there was an attempt to model the risk premium as a non-stationary process which implies a paradox. One cannot find cointegration between the forward rate and the future spot rate, ***and*** a cointegration between the forward rate, the risk premium, and the future spot rate (Kellard et al., 2001). This paradoxical effect is reconciled with theory only by assuming that the risk premium is stationary.

3. Empirical Analysis

First, the data is tested for unit roots. The unit root test that is selected is the KPSS test (Kwiatkowski et al, 1992). This test has the null of stationarity, and, compared to other tests, does not bias the results by over-rejecting the null hypothesis of stationarity. The quarterly and the semi-annual T-bill yields, together with the forward rate, follow all three a non-stationary distribution which dissipates in first-differences. The spread between the realized actual rate and the forward rate is stationary in distribution. Finally the ex post risk premium, which is the difference between the yield on an investment for 3 months rolled over for another 3 months, and the yield for an investment for six months, is also stationary. It must be mentioned that the rates for these two investments reject individually stationarity. This is more evidence that the ex post risk premium is stationary in distribution because the holding two period returns are non-stationary but are cointegrated, and have a stationary spread. All test results are available from the author upon request.

There are three consecutive panels in Table 1, which is captioned by the term "level regressions." All three panels are divided into 5 parts. The first part is fitting an Autoregressive Distributed Lag model, known as ARDL. The second part is estimating by Ordinary Least Squares (OLS) the same model with Newey-West heteroscedasticity and autocorrelation (HAC) standard errors and covariance (Newey-West and OLS, DOLS, and Canonical Cointegrating Regression, CCR. Each panel studies one version: regression of the 3-month Treasury bill yield on the forward rate for the period three months ahead, including in the regression the ex post risk premium, and running a regression of a model of the holding return on an investment for 3 months rolled over another 3 months on the holding return of an investment for 6 months. The ex post risk premium is modeled as the rolling premium, i.e. the difference in the holding return of a 6-month investment and a rolled over investment of 3 months. The 3-month return is the quarterly US T-bill yield, and the 6-month return is the 6-month US T-bill yield.

The ARDL regressions that are reported are for the long run impacts. One advantage of ARDL is that it does not impose the same lag length for all exogenous variables. In addition it permits the inclusion of dynamic regressors and fixed regressors. The dynamic regressor are non-stationary while the fixed regressors are the stationary variables. The first ARDL model, between the 3-month T-bill and the forward rate, is peculiar for three reasons. The first is that the constant is statistically insignificantly different from zero, while in the other four models the constant is negative and statistically highly significant. The constant is a measure of the constant risk premium. Second, the slope on the forward rate is +1 by inferential statistics. One would expect a bias. Third, the F-bounds test fails to reject the null hypothesis of no-cointegration, although the residual-based tests of Engle and Granger and of Phillips and Ouliaris reject this null. Overall one can conclude that this ARDL model is not satisfactory, casting doubts on the validity of the underlying model which is the risk-neutral unbiasedness hypothesis. The results of estimating the same model with OLS, and using Newey-West standard errors, are not favorable to the

[1]Uncovered Interest Parity is defined as the excess return between the change in the expected future exchange rate and the forward premium. Sometimes the forward premium is replaced by the differential in interest rates between domestic and foreign markets.

assumption of risk neutrality either, although the slope on the forward rate is insignificantly different from +1, having an actual t-stat of -0.1271. The reason for rejecting neutrality is that the constant is negative, as expected, and is highly significant statistically. This constant risk premium is -0.1956, or 19.56 basis points. This model also produces some peculiarities when the 3 cointegration techniques are applied to the data. All three find a statistically significant constant risk premium, having the expected negative sign. This risk premium is estimated by the three aforementioned techniques: -0.3246 (FMOLS), -0.3388 (DOLS), and -0.3247 (CCR). However these three estimates are higher than the single OLS estimate of -0.1956. Another peculiarity is that the slope on the forward rate is found to be significantly greater than +1, at the 5% one-tailed test. The critical t-statistic is 1.645, while the actual t-statistics are 1.6775 (FMOLS), 2.5308 (DOLS), and 1.6773 (CCR). Granted these two peculiarities the unbiasedness hypothesis under risk neutrality is rejected.

Table 1. Level regressions: (1) unbiasedness without a variable risk premium, (2) unbiasedness with the inclusion of the actual realized variable risk premium, and (3) relation between the 6-month holding period rate and the 3-month holding period rate rolled over another three months

Econometric procedure	Dependent variable	Independent variable(s)	constant	slope	Slope=1	Coefficient on risk premium	Cointegration test(s)
ARDL(3,0)	Actual 3-month T-bill yield	Forward interest rate	0.093917 (0.258987)	0.933144 (13.82778)	(-0.990709)		F-bounds test: 2.782906 (> 10%)
OLS with HAC correction	Actual 3-month T-bill yield	Forward interest rate	-0.195635 (-6.12048)	0.995875 (30.67211)	(-0.12705)	-	Engle-Granger: 0.0000 Phillips-Ouliaris: 0.0000
FMOLS	Actual 3-month T-bill yield	Forward interest rate	-0.324568 (-3.836930)	1.024766 (69.41095)	(1.677463)		
DOLS	Actual 3-month T-bill yield	Forward interest rate	-0.338803 (-5.463163)	1.027428 (94.80206)	(2.530861)		
CCR	Actual 3-month T-bill yield	Forward interest rate	-0.324680 (-3.835774)	1.024765 (69.40601)	(1.677282)		
ARDL(2,0)	Actual 3-month T-bill yield	Forward interest rate Risk premium	0.134615 (1.013893)	0.984644 (45.61949)	(-0.711453)	-0.490914 (-18.00425)	F-bounds test: 29.43338 (<1%)
OLS with HAC correction	Actual 3-month T-bill yield	Forward interest rate Risk premium	-0.122518 (-1.623296)	0.997484 (46.10641)	(-0.116298)	-0.736364 (-4.284654)	Engle-Granger: 0.0000 Phillips-Ouliaris: 0.0000
FMOLS	Actual 3-month T-bill yield	Forward interest rate Risk premium	-0.247852 (-4.475624)	1.022904 (106.5194)	(2.385073)	-0.723677 (-11.27735)	
DOLS	Actual 3-month T-bill yield	Forward interest rate Risk premium	-0.005127 (-4.156966)	1.000641 (5149.240)	(3.297231)	-1.960204 (-510.5486)	
CCR	Actual 3-month T-bill yield	Forward interest rate Risk premium	-0.248289 (-4.471355)	1.022866 (106.5503)	(2.381948)	-0.719034 (-9.444820)	
ARDL(4,4)	3-month yield rolled over	6-month T-bill yield	0.000860 (4.004321)	0.985052 (88.84278)	(-1.34812)		F-bounds test: 11.92778 (<1%)
OLS with HAC correction	3-month yield rolled over	6-month T-bill yield	-0.000563 (-1.694855)	1.000495 (51.93703	(0.025696)		Engle-Granger: 0.0000 Phillips-Ouliaris: 0.0000
FMOLS	3-month yield rolled over	6-month T-bill yield	-0.000811 (-4.238137)	1.011841 (151.2093)	(1.769565)		
DOLS	3-month yield rolled over	6-month T-bill yield	-0.000918 (-6.370652)	1.016547 (201.3735)	(3.277883)		
CCR	3-month yield rolled over	6-month T-bill yield	-0.000810 (-4.212106)	1.011793 (150.5571)	(1.754765)		

Notes: T-statistics in parentheses. The actual risk premium is equal to the annualized margin between the

6-month yield minus and the 3-month yield rolled over one additional quarter.

The second panel shows the results of regressing the actual T-bill yield on the forward rate and on the rolling premium, defined as the difference between the holding return for a 6-month investment and the ex post holding return of the quarterly T-bill yield, rolled over another 3 months. Since this difference is found to be stationary it is included in the ARDL specification as a fixed regressor, in contrast to the forward rate which is included as a dynamic regressor. Moreover the rationale in including this fixed regressor is by assuming perfect foresight. Later this assumption will be relaxed. This rolling premium enters significantly in all 5 estimation techniques mentioned above. The actual t-statistics are -18.0043 (ARDL), -4.2847 (OLS), -11.2774 (FMOLS), -510.548 (DOLS), and -9.4448 (CCR). Given that the sample is large these t-statistics can be compared to the z-statistics of a standard normal table. The coefficient on the ex post variable risk premium, that is included in the regressions, is close to -0.72 for three estimates (OLS, FMOLS, CCR), a bit higher at -0.4909 (ARDL), and much higher at -1.9602 (DOLS). These results ascertain that there is a statistically significant time-variable premium. This should not obscure the fact that there is also a constant risk premium of -0.25 (FMOLS, CCR). The other three estimates are outliers. For example the ARDL technique implies a positive time-variable risk premium, the DOLS implies a small and negative premium, and the OLS technique implies a coefficient of -0.1225. The slope on the forward rate is close to +1 but is significantly higher than +1 for three techniques (FMOLS, DOLS, CCR) and no different from +1 for the remaining techniques (ARDL and OLS). Although the results produce statistical significance the finding that the slope on the forward rate is different from +1 casts doubts on the model, unless if the variable risk premium is a function of the forward rate. Incidentally the F-bounds cointegration test, the Engle-Granger residual-based test and the Phillips and Ouliaris residual-based test, all three reject the null of no cointegration at very low marginal significance levels.

The third panel consists of the results of regressing the holding period for a 3-month investment rolled over another three months, on the holding return over 6 months. The choice of the first holding period return from rolling over the 3-month investment as the dependent variable is dictated by the fact that the second holding period return, the yield on a 6-month T-bill, is known for sure and in advance. This does not apply to the rolled over investment. The 5 regressions purport to find out whether the rational expectations assumption holds in the sample. If it does then the constant should be statistically insignificant and the slope no different from +1. The estimates of the constant are economically minute since they vary between 0.00112 and 0.00184 or between 0.112 and 0.184 basis points per annum. There is one outlier (ARDL). The slopes are all close to +1, but are estimated to be higher than +1 in 3 cases (FMOLS, DOLS, CCR) and equal to +1 in two cases (ARDL, and OLS). The high precision in the estimators explains the finding of statistically significant results. But economically the rational expectations hypothesis is given some support. Finally the F-bounds cointegration test, the Engle-Granger residual-based test and the Phillips and Ouliaris residual-based test, all three reject the null of no-cointegration at very low marginal significance levels.

Table 2 is also about level regressions. The panel has five parts similar to the five parts in Table 1. The model in all parts is a level regression between the actual 3-month T-bill rate on the forward rate with the inclusion of a time-variable risk premium. Instead of taking the actual ex post risk premium and assuming perfect foresight, the risk premium is modeled as an ARIMA(1,0,1) process. The fitted value from this Box-Jenkins model is the second variable in the regressions. The ARIMA model is as follows with actual two-tailed p-values in parentheses:

$$\hat{y} = 0.111538\ (0.0054) + 0.629063ar(1)(0.000) + 0.496544ma(1)(0.000)$$

The 5 regression techniques produce the following. First, what is surprising is that the constants of the regressions take both positive and negative values which happen to be statistically very significant. Although the slope on the forward rate is very close to +1 it is estimated to be significantly higher than +1. From these results one cannot judge whether any theory is verified. However the evidence for cointegration is strong. The F-bounds test has an actual F-value of 36.63, a value which implies a statistical significance well below the critical value of 1%. The Engle-Granger residual-based tests are also supportive of cointegration. While one finds a bias in the slope of the forward rate, it is the slope of the time-variable expected risk premium that is crucial. The estimated slopes are all negative, as expected, and highly significant statistically.

Table 3 provides for a measure of the constant risk premium by regressing the spread between the actual 3-month T-bill rate and the forward rate, on a constant. There are three procedures that correct for autocorrelation and heteroscedasticity: OLS, OLS with White-Hinkley standard errors, and OLS with Newey-West standard errors. The estimates are all the same, obviously, but the statistical significance varies. It is 0.0000 for the first two procedures and 0.0074 for the third one. This confirms that the constant risk premium is negative, as

expected, and equal to -0.2157, or -21.57 basis points.

Table 2. Level regressions with the inclusion of the expected risk premium, modeled as an ARIMA(1,0,1) process

Econometric procedure	Dependent variable	Independent variable(s)	constant	slope	Slope=1	Coefficient on risk premium	Cointegration test(s)
ARDL(2,0)	Actual 3-month T-bill yield	Forward interest rate Risk premium	0.201618 (1.839703)	0.984900 (60.28503)	(-0.924282)	-0.770365 (-21.73413)	F-bounds test: 36.63099 (<1%)
OLS with HAC correction	Actual 3-month T-bill yield	Forward interest rate Risk premium	-0.060539 (-1.121189)	0.998813 (66.32331)	(-0.078832)	-1.355948 (-4.284654)	Engle-Granger: 0.0000 Phillips-Ouliaris: 0.0000
FMOLS	Actual 3-month T-bill yield	Forward interest rate Risk premium	-0.180483 (-3.966654)	1.021064 (129.8301)	(2.678350)	-1.356389 (-21.23190)	
DOLS	Actual 3-month T-bill yield	Forward interest rate Risk premium	0.067043 (57.54983)	1.000622 (5789.596)	(3.596842)	-2.606393 (-578.3323)	
CCR	Actual 3-month T-bill yield	Forward interest rate Risk premium	-0.179845 (-3.828479)	1.021068 (129.7414)	(2.676999)	-1.363191 (-9.857029)	

Notes: T-statistics in parentheses.

Table 3. Implied estimates of the constant risk premium

	Ordinary least squares (OLS)	OLS with White-Hinkley (HC1) heteroscedasticity consistent standard errors and covariance	OLS with Newey-West heteroscedasticity and autocorrelation consistent (HAC) standard errors and covariance
Constant risk premium:	-0.215674	-0.215674	-0.215674
t-statistic	-6.437827	-6.437827	-2.683965
p-value	0.0000	0.0000	0.0074

Table 4. Implied estimates of the constant risk premium and of the coefficient on the time-variable risk premium. The variable risk premium is the fitted value of an ARIMA(1,0,1) model of the difference in holding returns

	Ordinary least squares (OLS)	OLS with White-Hinkley (HC1) heteroscedasticity consistent standard errors and covariance	OLS with Newey-West heteroscedasticity and autocorrelation consistent (HAC) standard errors and covariance
Constant risk premium:	-0.066288	-0.066288	-0.066288
t-statistic	-2.312033	-2.076029	-1.918311
p-value	0.0211	0.0383	0.0555
Coefficient on Variable risk premium:	-1.356118	-1.356118	-1.356118
t-statistic	-18.41136	-7.255012	-9.145099
p-value	0.0000	0.0000	0.0000
Test that slope is -1:			
Value	-0.356118	-0.356118	-0.356118
t-statistic	-4.834839	-1.905173	-2.401511
p-value	0.0000	0.0572	0.0166

Table 4 takes the spread in Table 3 and regresses it on a constant and on the ARIMA expected time-variable risk premium, with the same three econometric procedures as in Table 3. The constants are now lower at -0.0663, or -6.63 basis points, but the slopes are all higher than +1 in absolute value, and statistically significantly higher than +1.

Table 5 is similar to Table 4 but, instead of the expected risk premium, the independent variable is the ex post risk premium. The constants are somewhat higher at -13.47 basis points, and the absolute slopes are insignificantly lower than +1 in the two regressions with adjustments of the standard errors. Because of these

results we shall adopt the findings in Table 5 as those that are applicable. Therefore the conclusion is that the forward rate is an unbiased predictor of the future rate, with the addition of a constant and a time-variable risk premium. The constant is -13.47 basis points as already mentioned, and the mean effect of the ex post time-variable risk premium is an additional -8.11 basis points, giving a total average risk premium of 21.58 basis points. This is on the upper side of the actual historical premium between the 6 and 3-month investment of 14 basis points. This variable risk-premium has a maximum of 184.6 basis points, and a minimum of -123.2 basis points. If one takes the median estimate the time-variable risk premium averages 5.15 basis points, making a total of 18.62 basis points. Given the small-sample bias and the presence of sampling errors such an estimate mirrors a satisfactory achievement to explain the average risk premium. It must be noted that the actual historical risk premium of 14 basis points is the spread between 6 and 3-month investments, while the risk premium estimated in this paper is between the expected 3-month interest rate and the 3-month forward rate. Therefore hedging in forward markets carries an additional risk premium that speculators are likely to require.

Table 5. Implied estimates of the constant risk premium and the coefficient on the time-variable risk premium

The variable risk premium is the difference in holding returns

	Ordinary least squares (OLS)	OLS with White-Hinkley (HC1) heteroscedasticity consistent standard errors and covariance	OLS with Newey-West heteroscedasticity and autocorrelation consistent (HAC) standard errors and covariance
Constant risk premium:	-0.134712	-0.134712	-0.134712
t-statistic	-4.217893	-3.760049	-3.096866
p-value	0.0000	0.0002	0.0020
`Coefficient on Variable risk premium:	-0.736609	-0.736609	-0.736609
t-statistic	-4.834440	-3.753523	-4.834440
p-value	0.0000	0.0002	0.0000
Test that slope is -1:			
Value	0.263391	0.263391	0.263391
t-statistic	3.851499	1.342153	1.728658
p-value	0.0001	0.1800	0.0843

Exhibit 1 depicts the total risk premium, in which the time-variable risk premium is added to the constant risk premium. The graph shows very high volatility, but this is just due to the fact that the graphed series is blown out of proportion. The actual risk premium varies in a close bracket, between -1% and +2%, and this is only at times of high turmoil in financial markets (the early 1980s). Most of the variation is centered at 0.25%, or 25 basis points. However, one cannot ignore the visual evidence that the risk premium has moved in clusters, implying the existence of serial correlation and conditional heteroscedasticity. This is confirmed by the Ljung-Box Q-statistics.

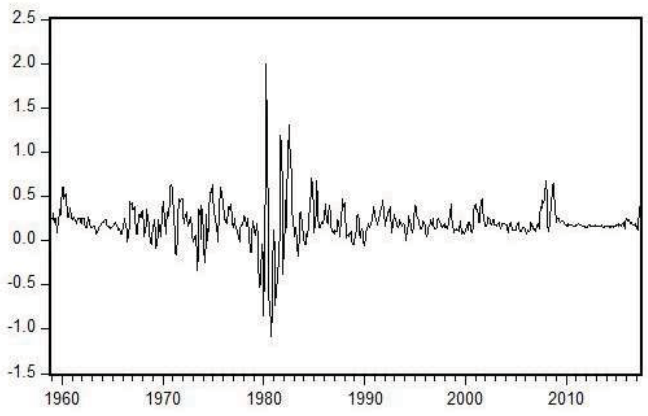

Exhibit 1. Total risk premium

4. Conclusion

This paper studies the relation of unbiasedness between the 3-month forward interest rate, derived from US T-bills, and the 6-month US T-bill interest rate. Risk neutrality, forward market efficiency, and unbiasedness are

rejected in our sample. This implies the existence of risk premiums. There is strong evidence for a constant risk premium and a time-variable risk premium. The constant risk premium averages 13.47 basis points and the average of the time-variable premium is 8.11 basis points, making a total of 21.58 basis points. The time-variable risk premium ranges between a maximum of 184.6 basis points, and a minimum of -123.2 basis points. If one takes the median estimate the time-variable risk premium averages 5.15 basis points, making a total of 18.62 basis points Therefore hedging by forward rates is not risk-neutral, or, else, forward transactions carry a certain risk. Although this risk premium is small, i.e. is less than 1%, it is still highly significant statistically. The results contradict the notion that the short end of the interest rate market is practically riskless. An avenue for future research is by studying other maturities. The methodology in this paper is appropriate for that purpose, and little is needed to adapt it.

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A Study on the Theories' Gap of Technological Entrepreneurship Opportunities Emergence

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Abstract

Many believe that traditional models and traditional theories of identifying and exploiting opportunities in such situations do not have the required efficiency since they act linearly and require nonlinear models to identify and exploit these opportunities. Henceforth, adapting compatible and innovative strategies are necessary to meet the changing needs of customers as well as environmental uncertainties. In this research, while studying existing theories about technological entrepreneurship opportunities, a theoretical gap was studied. The study showed that there are several questions that have not been addressed in existing theories and more research should be done to answer these questions and to fill the theories gap.

Keywords: technological entrepreneurial opportunities, opportunities emergence, theories' gap

1. Introduction

In purpose of taking the advantages of the business opportunities emergence and to remain in the realm of competition, companies are forced to remain in the creating theory that the end of the evolutionary enactment cannot be considered from the beginning. In this regard, it can be argued that future opportunities are not related to existing information and therefore it is necessary to create new knowledge and information. In this situation, it is impossible to predict the probable outcome of the formation and exploitation of entrepreneurial opportunities, as well as, the probability of occurrence of those outcomes are unpredictable. This situation is similar to the definition of uncertainty, which was first proposed by Knight (1921). Creation theory is used to describe the formation and exploitation of entrepreneurial opportunities in which entrepreneurs are in a state of Knightian uncertainty or indecision (Alvarez & Barney, 2005), and there is no knowledge of the opportunity. The evidence of this is an investigation of research and development projects and business plans failures that arise from the mismatch of predictions with the actual events that take place in the future, and this issue is due to the unpredictability of many of the anomalies and phenomena of society. Therefore, past processes and mechanisms are not responsive to new phenomena due to current rapid changes.

On the other hand, in anticipation of opportunities that are in the context of Knightian uncertainty, there is no room for prediction. According to Sarasvathy (2008), entrepreneurs, in anticipation of opportunities that are in uncertain conditions, instead of anticipating, organize to control process according to available facilities, and by receiving feedback from the information environment, modifying or tracking their goals. Under uncertainty, entrepreneurs follow the decision logic that is different from traditional and logical entrepreneurial models (Sarasvathy, 2008).

Many believe that traditional models and theories of identifying and exploiting opportunities in such situations do not have the required efficiency for the reason that they work linearly and nonlinear models are needed to identify and exploit these opportunities. Hence, adopting innovative and compatible strategies are necessary to respond to the rapid changes in customer needs as well as environmental uncertainties. These days, regarding the rapid technological changes, we have discovered and created many opportunities, among which the creating

opportunities have formed great value, for example, eBay 1.3 billion dollars, Yahoo 3.18 billion dollars, Facebook 33 billion dollars, WhatsApp 22 billion dollars. These statistics show the importance of emerging opportunities through entrepreneurial actions (Alimadadi et al., 2018). In the present research, the concept and theories of technological entrepreneurship opportunities have been investigated and the gap between existing theories has been studied based on previous studies.

2. Technological Entrepreneurial Opportunities

Wood and McKinley (2010) present a conceptual model of the production of entrepreneurial opportunities with a constructivist approach that assumes that the process of constructing opportunities involves various stages, including the conceptualization of an idea, objectification of the idea and approving the idea of a new business by an entrepreneur. All ideas will not survive in these stages. Between the stage of conceptualization and objectivity, some ideas are abandoned intended for lacking objectivity. Also, between the stage of objectification and approval, some of the opportunities are left out due to the insufficient support of resources (Wood and McKinley, 2010).

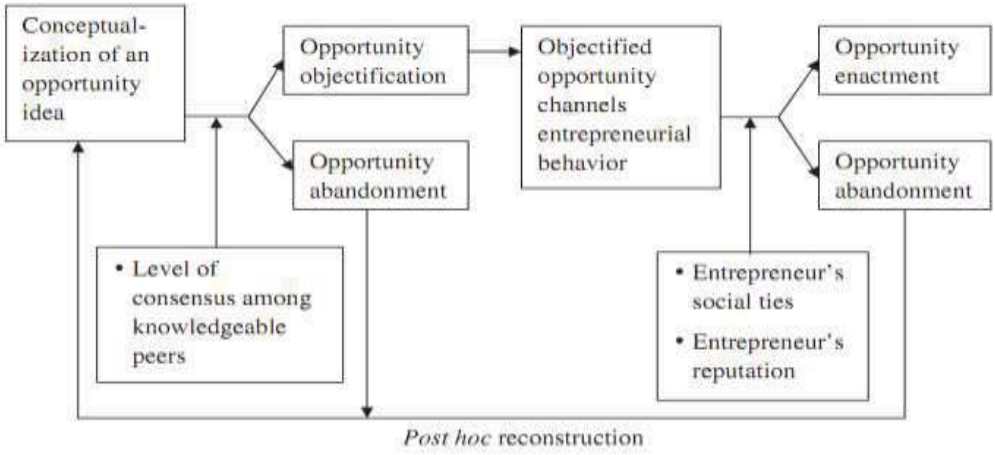

Figure 1. Opportunity creation process (Wood and McKinley, 2010)

In this process, opportunities arise when the entrepreneur, through the social world, has a cognitive assessment of reality. This process starts from an early idea in the entrepreneur's mind (Wood and McKinley, 2010).

2.1 Process of Objectivity of an Opportunity

In the stage of objectivity, the entrepreneur participates in a meaningful process. In this process, the entrepreneur tests the profitability of his initial idea by interacting with his counterparts, such as friends, family members, coaches and other people who have close ties with the entrepreneur and those who trust the entrepreneur. This step is due to uncertainty about the ability to profitability and the entrepreneur chooses their counterparts for access and trust. In the meantime, not all peers share the same value, but peers who have more knowledge, their beliefs give them more weight in objectivity. The objectivity stage transforms the idea into an objective opportunity, which is the quality of a foreign reality, for the entrepreneur. The greater the agreement between well-informed counterparts about the profitability of an idea, the greater likelihood of an entrepreneur's opportunity, and thus more entrepreneurial action (Wood and McKinley, 2010).

2.2 Process of Adopting the Opportunity

At this stage, ideas that have become an objective opportunity in the stage of objectivity may lead to an opportunity adopting level. At this point, the entrepreneur begins to participate in focused efforts to examine the likelihood of attracting resources for investment in time. This stage involves active participation in the social environment and bringing together a group of stakeholders that is wider than the group of counterparts in the previous phase. The entrepreneur strives to attract stakeholders to a future approach and ultimately reaches a common understanding of it, including an ongoing process including negotiating with potential investors, getting in touch with potential employees, examining potential clients, and Searching for required technology. With this exertion, the entrepreneur receives feedback from the stakeholders that will help him improve the next steps to influence on stakeholders. If common understanding between stakeholders is developed, the objectivity of opportunity for entrepreneurs and stakeholders will be strengthened. The constructivists believe that at the stage of adoption, the knowledge and beliefs of the external actors are influenced by the entrepreneur and vice versa. In general, the adoption of the opportunity is a social and cognitive process that, by bringing stakeholders into

objectivity of opportunity, the entrepreneurial project becomes an objective opportunity for exploitation (Wood and McKinley, 2010)

2.3 Entrepreneur in the Process of Producing Ideas

Wood and McKinley (2010) indicate the importance of social ties and fame at the stage of adapting opportunity. By increasing social ties, access to stakeholders will be enhanced, which will facilitate the attraction of financial resources and human resource. Entrepreneur's reputation has also led to a decline in stakeholders' uncertainty about the successful adoption of an objective opportunity. In other words, fame leads to a positive signal to the stakeholders about the appropriateness of adoption of an opportunity (Wood and McKinley, 2010).

3. The process of the Emergence of Technological Entrepreneurship Opportunities

3.1 Process Approach

The approach currently addressed in entrepreneurship literature is a process approach (Davidsson, 2005). Davidsson (2005) points to the existence of several process models in entrepreneurship, which states that given the fact that there are experimental process models inversely, it is believed that the use of these models depends on the context. He wondered if there was the best process. Via this question, he introduces two different models of the entrepreneurial process, the models presented by Bhave (1994) and Sarasvathy (2001), arguing that most of the real-world processes are at the point between these two types of linear processes (Analytical and programmed) and emerging (creative and repetitive), and the superiority of one model to another depends on the proportion of the type of process and other key factors, i.e. the entrepreneur, the environment and the opportunity features or idea. Therefore, targeting an entrepreneurial process in the proper field, it provides a model of entrepreneurial components. The main point in this model is that there is no direct relationship between process and performance, nonetheless, the relative success of a process depends on its fitness with the entrepreneur, idea or opportunity and environment characteristics (Davidsson, 2005).

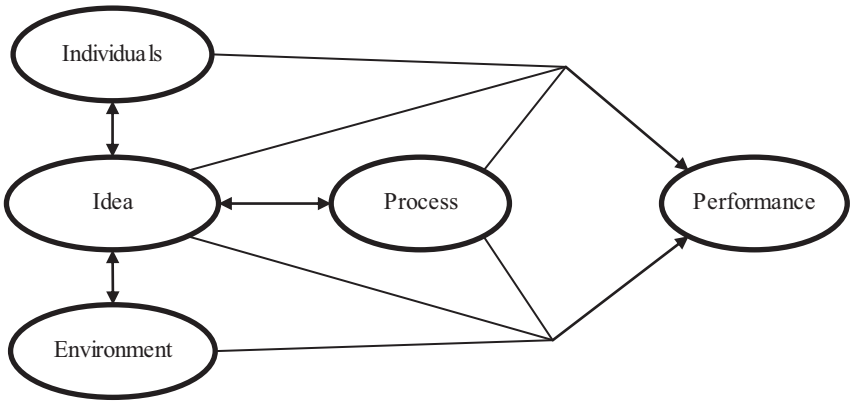

Figure 2. Entrepreneurial components (Davidsson, 2005)

Concerning the fitness between the entrepreneur and the idea and environment, literature points to the fact that entrepreneurs are looking for ideas that can use their own unique interests and skills in them, which is a central issue in resource-centered theory. This fitness is in accordance with the Impact Model (Sarasvathy, 2008), which begins with entrepreneurial resources. Also, the bricolage theory (Baker & Nelson, 2005) emphasizes the use of available resources by an entrepreneur. For example, this fitness refers to the difference between experienced and novice entrepreneurs in choosing ideas. Experienced entrepreneurs are able to choose between intuitive, innovative and analytical decision-making methods in accordance with the degree of uncertainty associated with the idea, while novice entrepreneurs are not able to differentiate between different situations and thus similar methods are used for different situations with varying degrees of uncertainty. The ability of experienced entrepreneurs to adopt the decision-making method to the position enables them to choose any type of idea, while it is suggested to novice entrepreneurs to choose ideas that there is less uncertainty and analytical methods are suitable for this type of entrepreneurs (Davidsson, 2005).

3.2 Source-driven Theory

Penrose (1959) describes how the company's resources influence its growth, in which insufficient resources limit growth. Barney (1991) presented the principles of source-centered theory and developed it. He provided an accurate definition of resources and a complete set of features that transform a resource into a potential source of

competitive advantage (value, scarcity, non-immutability, and non-interchangeability).

Alvarez and Busenitz (2001) described the use of resource-centric approach in entrepreneurship and examined the relationship between source-centered theory and entrepreneurship. They referred to heterogeneity as a common feature between two source-centered and entrepreneurial theories. But in source-centered theory, the focus is on resource heterogeneity, while entrepreneurship theory focuses on heterogeneity in the belief that there is resource value that enables entrepreneurs to transform homogeneous resources into heterogeneous outputs and have a better choice than others. The main question in the application of resource-centered theory in entrepreneurship is that of the source of heterogeneous sources of entrepreneurship. In this regard, Baker and Nelson (2005) use the concept of Bricolage (Lvi-Strauss, 1966) and according to Penrose's (1959) That companies may offer heterogeneous value based on seemingly homogeneous resources, a process model provides a process for the behavior of entrepreneurs in combining resources and adopting their own resource environment in Penrose's environment (Baker & Nelson, 2005).

Wernerfelt (2011) has considered a process in which a company can home resources. He argued that current resources create asymmetry in competition for new sources. He argued that current resources create asymmetry in competition for new source (Wernerfelt, 2011). This argument is consistent with the first type of path dependence, which was proposed by Alvarez and Barney (2007) and referred explicitly to the theory of action since in the theory of action, entrepreneurs responded to the questions "Who am I? What I know and who I know. "And finally, the answer to the question" What can I do? "(Sarasvathy, 2008).

3.3 Theory of Uncertainty

Uncertainty is one of the fundamental concepts in most entrepreneurial theories (McMullan and Sheffield, 2006); in the creation Theory, for the decision to invest in an opportunity, the important consequences of this decision is not certain and the probability of these results when making a specific decision is unclear thus the entrepreneur faces a lack of trust (Knight, 1921) (Alvarez and Barney, 2007).

Many theories have conceptualized the role of uncertainty in entrepreneurial action to explain why an entrepreneur opted an opportunity. On this basis, two main trends emerged in the conception of uncertainty in entrepreneurship literature.

1. The first stream focuses on perceived uncertainty and seeks to differentiate between entrepreneurs and non-entrepreneurs based on differences in their knowledge. Therefore, uncertainty is considered as an obstacle to entrepreneurial action. In this context, there are some entrepreneurial entrepreneurs who know what to do and the distinction between entrepreneurs and non-entrepreneurs is that entrepreneurs know what they should do, that is, less understanding of uncertainty.

2. The second flow tends to endure uncertainty and sees the distinction between entrepreneurs and non-entrepreneurs in the difference between their motivation, their attitude and their willingness to take risks. Therefore, unwillingness to tolerate uncertainty is an obstacle to entrepreneurial action. In other words, entrepreneurship is not seen as the result of less understanding of uncertainty, but rather as a result of the desire to tolerate the uncertainty that everyone faces (Bauer et al., 2017).

Milliken (1987) distinguishes between three types of uncertainty faced by decision makers (McKelvie et al., 2011):

1. Situational uncertainty refers to situations in which actors do not have the ability to predict changes in the environment and understand the environment unpredictable. The question an actor faces in this uncertainty is, what is happening in the environment? Dynamics in an entrepreneurial environment leads to uncertainty of certainty that uncertainty in customer demand or technology is classic examples of it (McKelvie et al., 2011).

2. The effect of uncertainty, which is defined as the inability to predict the effect of future approval on the organization or the prediction of the effect of environmental changes on the organization. The question of an actor in this situation is what is the events influences on me in the environment?

3- The uncertainty of answer is defined as the lack of knowledge about response options or inability to predict the results of choosing a response. An important question in this uncertainty is what to do in this regard relating to external events?

Sarasvathy (2008), similar to Milliken (1987), identifies three types of uncertainty which entrepreneurs face:

1. The uncertainty of a statement in which its results and distribution are not known.

2. Objectives ambiguity where priorities are not clear. Even the entrepreneur himself does not know exactly what he wants.

3. Isotropic uncertainty in which it is unclear what elements should be considered and ignored in the environment? For example, which elements of customer's feedback should be considered and what should be ignored. He knows the question of potential customers in the same way that we intend to determine the foods that are not consumed by examining the contents of a waste bin (Sarasvathy, 2008)

3.4 Institutional Theory

North (1990) defines institutions as human constraints that construct social, economic, and political interactions. From the perspective of North, institutions are designed by humans to establish order exchanges and reduce uncertainty. These constraints determine the cost of production and exchange, as a result of business start-ups, and the profitability and feasibility of economic activity (Veciana & Urbano, 2008). Scott (1995) defines institutions in three categories of law (laws, regulations, and rules), normative (defines legitimate means for pursuing values), and cognition (refers to implied beliefs) (Scott, 1995), which provides incentives to direct or inhibit social behavior, such as entrepreneurial activity in an economy. The legal entities include government regulations and industrial agreements and standards that guide entrepreneurs' behavior by means of rules such as rules of play, supervision, and coercion. Normative institutions guide the behavior of entrepreneurs by defining what is right or expected in different business and social situations. These institutions include values (what is rightly considered) and norms (how things must be done according to values) that create rules for obedience. Cognitive institutions are rules and mental definitions that define the range of correct behaviors and beliefs (Stenholm et al., 2013).

There are three streams in the application of the theory of entrepreneurship (Bruton et al., 2010):

1. The first stream explores the impact of institutional conditions on entrepreneurship, in which the developed institutional environment fosters entrepreneurship and improves the inadequacy of the institutional environment of entrepreneurship. The lack of formal institutions or the lack of unofficial institutions to replace them, due to increased transaction costs, is a hindrance to entrepreneurship. Also, the existence of complicated and excessive regulations, which requires entrepreneurs to spend considerable time and money to meet the requirements, has the same result. Therefore, institutional environment is also effective not only on entrepreneurial entry rates but also on the path to entrepreneurial actions (Bruton et al., 2010).

2. The second one is related to the relationship between legitimacy and entrepreneurship and addresses how entrepreneurs are seeking acceptability for their businesses. In other words, entrepreneurs have to take the desired behaviors of a given system in a social system because otherwise they will be sanctioned by deviating from accepted norms (Bruton et al., 2010).

3. The third stream deals with institutional entrepreneurship. Entrepreneurs work in areas that have not yet developed. Accordingly, DiMaggio (1988) argued that entrepreneurs may, alone or with the participation of others, build new institutions that help develop their field of activity or organization. So entrepreneurs may improve the environment as an entrepreneurial entity and create structures that help their business (Bruton et al., 2010). The concept of institutional entrepreneurship answers the question of how new institutions are developing and changing. Therefore, institutional entrepreneurship involves the activities of actors who have an interest in consolidation some institutions or those who use resources to create new institutions or change them (DiMaggio, 1988; Bruton et al., 2010).

4. Theoretical Gaps

Under what conditions will the opportunity be created for discovery, or for the discovery opportunity of creation?

A creation opportunity may turn into an opportunity for discovery, and vice versa. The conditions in which these transformations can take place requires extensive study. Of course, given that the discovery opportunities rooted in critical realism and creativity opportunities are rooted in evolutionary realism, the attempt to develop a single theory of both opportunities is like mixing water and oil, maybe They will be combined for a time, but will be re-detached again(Alvarez & Barney, 2010).

How can organizational and psychological processes be used to combine decision-making processes in terms of risk and uncertainty?

The study of the formation of opportunity is a reminder that opportunities have a complex nature and have aspects of risk and uncertainty. For example, an entrepreneur may know enough about the likelihood of being able to fund the bank but not enough informed about how customers can respond to new product technology. The first aspect is the risk and the second one is uncertainty. In this case, the entrepreneur may be involved in both the process of creating and discovering the opportunity, but the probability that a single aspect of this process of

forming opportunity involves both the mode of creation and the discovery of opportunity is low. However, entrepreneurs and others involved in the processes of creation and discovery simultaneously face an unmanageable challenge: how to apply two different decision-making approaches at the same time. Opportunity discovery includes a set of skills, such as data collection and analysis using risk-based decision-making tools. The creation of opportunity involves a different set of skills, such as intuitive, deductive, and repetitive decisions. Is a single decision maker, which can be involved in both the decision-making process simultaneously, a person or a company? For both the individual and the company, the combination of these skills involves a new type of two-sided power that cannot be simultaneously investigated and exploited (Tushman & O'Reilly, 1996), but can simultaneously detect and create Slowly The psychological and organizational processes that make this type of dysfunctional are to be described (Alvarez et al., 2013).

How the relationship between the micro level processes adopts the mood and the macro level process The theory of evolution (change, selection, maintenance)

Weick (1979) observes that adoption at the individual level can lead to evolutionary processes at the organization level. Likewise, Ruef et al., (2003) observed that evolution at the organizational level includes a kind of adoption process at the individual level, as described by Weick (1979). The relationship between the process of adopting the creation and the evolutionary theory of entrepreneurship needs to be further developed. Although it seems that understanding the process of creating the opportunity may eventually approve the relationship between micro-level processes and macro-level processes of change, selection and maintenance of organizations (Alvarez & Barney, 2010).

Appearing Companies created to exploit the opportunities of creating the first companies in a crowd. These organizations do not have existing stock companies for imitation, and therefore a challenge for the organization here is to establish it in a new form (McKelvey, 1982). Therefore, the perception of the emergence of a company that seeks to create and exploit a creation opportunity may differ from the perception of the emergence of a company to exploit a creative opportunity (Alvarez & Barney, 2010).

Application of creation Theory in Company Theory (Exchange Cost Theories and Defective Contract Theory)

Although the level of analysis in the process of creating the opportunity is usually considered by the individual, business processes can, in fact, be considered at the level of the group, company or organization (Alvarez & Barney, 2007). The study of the formation and exploitation of opportunities on the one hand and the theory of the company, on the other hand, are inter-related (Alvarez and Barney, 2005). Indeed, one way to form and exploit opportunities is to use a company, the hierarchical administration of the economy of exchange cost (Williamson, 1985) and the incomplete contract theory (Hart and Moore, 1988). These theories assume that the decision is about how to handle an exchange under risk conditions rather than uncertainty (Alvarez & Barney, 2008). The exchange cost theory assumes that at the time of creating the company, the exchange parties can estimate the relative value of the investment to complete an exchange. Also, in the incomplete contract theory, it is assumed that one can estimate who has the most revenue from the exchange. Uncertainties do not exist (Alvarez and Barney, 2007). Therefore, the process of creating and exploiting opportunities is a significant challenge for the application of economic theory. Under the conditions of uncertainty, economic actors cannot understand, even in the probable way, how the opportunity arises, and as a result of the conditions of exploitation, and who will exchange the most benefits in exchange. In conditions of uncertainty, resources and capabilities must also be combined to form and exploit the opportunities of the people. When decision variables are considered by the economy of transaction costs and incomplete contract theory, it is unclear at the time of the decision how decisions about hierarchical management and the allocation of residual rights should be made?

In company behavioral theories, focusing on the origin, modification, and transfer of current organizational methods and focusing on organizational processes may be useful resources for theorizing for connecting the creation of the opportunity and the corporate theory. In other words, the emphasis is on how events and experiences turn into decision-making processes and routines decisions may be the best flow of research to understand the relationship between the opportunities and the companies that are used to exploit them. Alvarez and Barney (2005) refer to some of the possible tools that can be used to create and exploit creative opportunities. In general, when researchers begin to examine corporate theory questions in terms of decision-making in a state of uncertainty, research in the area of the process of creating opportunity creates a greater understanding of the conditions under which the various forms of exchange management, such as markets, Hierarchies and intermediate forms of administration are selected (Alvarez et al., 2013).

Investigating the relationship between the creation of opportunity and organizational forms

Traditionally, theories of the corporation have focused on the conditions under which those economic actors

choose the hierarchical forms of management, that is, companies select the business to manage economic exchanges (Williamson, 1985). Companies have different entities. Research in organizational forms began with Burns and Stalker (1961). One of the factors that may affect organizational form is the formation and exploitation of opportunities whose impact is less understood. Factors affecting organizational forms include cases such as the corporate environment, the establishment team (Beckman, 2006), attempts to gain competitive advantage (Barney, 1991; 1986), institutional pressures (DiMaggio & Powell, 1983) and social movements (Swaminathan and Wade, 2001). But the effect of forming and exploiting the opportunity is less understood. For example, companies created to exploit created opportunities may not be able to adapt to the forms of organization that prevailed in a pre-existing industry. Under conditions of creation, the organizers may choose their organizational form based on their personal experiences (Stinchcombe, 1965), or potentially select the forms of the industry in the field of new creation. Companies focus on learning and experimentation in this context, and choose the corporate commitment forms (Burton, 2001), family-centered (Ouchi, 1980) and Organic (Burns & Stalker, 1961). The connection between opportunity and other forms of organization requires more attention. These questions require more experimental and theoretical analysis (Alvarez et al., 2013).

How does the process of creating opportunity lead to a competitive advantage?

It seems that creation processes to be the source of corporate advantage over discovery processes. Although this is a question that has not been asked yet and has not been answered. Because the information on the discovery process of information about creation processes is more accessible, it is likely that these advantages are temporary because the next actors imitate the successful actions of the previous entrepreneurs. In general, those exploiting discovery opportunities may have a sustainable competitive advantage, provided that their actions are protected by natural or accepted barriers). However, the processes of creation are dependent on the path and in which the creation of paths occurs, and if the opportunity is successfully formed and exploited, it can lead to unintended ambiguous advantages that result from learning experience through a unique action of an entrepreneur. This may make it harder for people to create opportunities for imitation (Barney, 1991). Since the processes of production have a significant output variance, the formation of creating opportunities has no basis to be used by entrepreneurs (Alvarez et al., 2013).

For the reasons given above, the difference between the formation and exploitation of discovery opportunities and creative opportunities may be a great experimental ground for testing some of the claims of a source-centered theory. Indeed, Opportunity Research may be one of the keys and unconfirmed assumptions of the source-driven theory. In particular, this theory assumes that resources and capabilities are distributed in a non-uniform way between actors, but does not explain how this heterogeneity comes from. Research in the process of opportunity refers to at least two sources of non-homogeneity:

(1) In a field of discovery, heterogeneity in resources and capabilities after the discovery and exploitation of opportunity may be due to previous differences in the consciousness of external shocks to the market or industry;

(2) In a context of creation, heterogeneity in resources and capabilities after the creation and exploitation of opportunities is due to an evolving vagrancy process that is unpredictable and dependent on the path through which the same actors are different. To the extent that exploratory opportunity can explain the source of differences in resources and capabilities, it may be able to complete strategic management research (Alvarez et al., 2015).

Unanswered Questions (Alvarez & Barney, 2007)

Concerning the formation and exploitation of opportunities, there are questions that are more consistent with the creation theory, but have not been answered or asked at all (Alvarez & Barney, 2007):

- How does entrepreneurial action create opportunities?

- Is the difference between entrepreneurs and non-entrepreneurs the cause or effect of entrepreneurial action?

- How do entrepreneurs use gradual, duplicate and inductive processes for decision-making?

Future research in entrepreneurship should carefully consider the information requirements that entrepreneurs act in (Alvarez & Barney, 2007).

The usage of creation Theory to answer an unanswered question in source-centered theory

One of the important questions in resource-based theory is that from where the sources of heterogeneity that lead to competitive advantage come from (Barney, 2001), which has not yet been answered (Alvarez & Barney, 2007). The creation Theory provides an answer to this question. Under the conditions of uncertainty, the adoption process over time has led to an exacerbation of very small differences at the beginning of the process of creating

the opportunity. Therefore, the approval process can lead to heterogeneity in the resources and capabilities of valuable, scarce and costly imitation resources, thereby creating a sustainable competitive advantage. Because this process is different for individuals, teams, corporations, and organizations. The link between source-centered theory and creation theory refers to the role of path dependence (Arthur, 1989). The path dependence in the theory of creativity is of two types. The first type of path dependence refers to the fact that the opportunities determined by the entrepreneur relate to knowledge and information that has already existed in a previously established pathway and affects the actions of the entrepreneur. In the second type of path dependence, the entrepreneurial action is not only influenced by an existing path, but it can also create that route. The second-order dependence of the second-generation theory is related to researchers, who consider the initial condition as an initial design that determines the original shape of a company and its following development (Nelson and Winter, 1982). Creation theory points to the fact that the preliminary conditions of the company may be the result of the actions that entrepreneurs have taken to create the opportunity (Alvarez & Barney, 2007).

Changing in actors for the creation of opportunity

The process of creating the opportunity changes the actors involved in the process (Alvarez and Barney, 2010), but there is still no empirical research to test this conjecture.

5. Discussion and Conclusion

Technology entrepreneurship classifies the entrepreneurial opportunities of the technology-driven by identifying, determining, or creating and exploiting those opportunities. It also involves managing small businesses owned by engineers and scientists, introducing applications for a specific technology, starting new technology-centric businesses, introducing new applications, or manipulating opportunities that all rely on scientific and technical knowledge Besides working with others to create technology or technology change.

Technology-based micro-enterprise through research and development, technology creation, technological opportunities, technology transfer, and technology management lead to the creation of technology-based companies and technological innovation in existing organizations. According to statistics provided by the GEM Center, the Innovation Entrepreneurship Indicator, which represents the emerging and new entrepreneurial entrepreneurship TEA, 12.3% of new enterprises occur in the adult population (18-64 years old). The "Understanding the Entrepreneurial Opportunity" indicator, which indicates an individual's perceived opportunities for the environment around him in the next 6 months, is 36.9 percent in 2016, which is ranked 40th among 67 countries (Global Entrepreneurship Center Report, 2016).

One of the typical methods of companies to decide future trends is R & D activities. Among the most important factors in the failure of research and development plans are mistakes in initial estimates, uncertainty in estimates and performance, external factors changes, and, eventually, the complexity and extent of the project scope. The notion of creating is an opportunity to outline the actions that entrepreneurs take to shape and exploit opportunities (Sarasvathy et al., 2003).

Mentality opportunities deliver opportunities where none of the parties have a clear and distinct supply and demand, then one or both of them must be created and several economic patents must be made in the way of marketing, franchising, etc., so that opportunity can be created. This perception of opportunity deals with the creation of new markets (Sarasvathy, 2003).

Based on the research carried out by various thinkers, the process of the emergence of opportunity is not fully understood and requires further research. The aspects of the creation Theory are described by a group of writers (Ruef et al., 2003; Alvarez and Barney, 2007; Baker and Nelson, 2005; Sarasvathy, 2003; Sarasvathy, 2001). Nevertheless, creation theory still needs to be elaborated as a coherent theory in literature. Faced with everyday problems, it is easy to understand processes and events that lead to the emergence of opportunities It is comprehensible to understand the processes through being with them and living with them, but in technological matters, since this is not possible for us, we can rely on the information of individuals and organizations that have encountered these issues, and create technological entrepreneurship opportunities in addition to use measuring and identify research variables, questionnaires and standard questions developed and industrialized by other researchers (Nelson, 2005; Sarasvathy, 2001; Weick, 1979).

Therefore, in the present study, the gap between theories was discussed and it turns out to be clear that in some cases there are questions that need to be addressed to develop theories.

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Analysis of and Discussion on the Tourists to Taiwan from 2014 to 2016

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Abstract

In the 21st century, tourism has become one of the most significant social and economic index as well as a foreign exchange accelerator of all countries. This research adopted the data from the Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017) and relevant information from 2014 to 2016 to analyze microeconomic factors that affect the tourists to Taiwan such as the residence, gender, purpose, age and occupation of tourists to Taiwan, length of stay, transportation tools, and entry ports, and visitor expenditures. This research draw conclusions according to the research results and gave some specific and practical suggestions on operation improvement and policy making to the tourist industry, relevant governmental units and academic studies.

Keywords: tourism, microeconomic factors, tourist industry

1. Introduction

Since the Taiwanese government opened Taiwan to the tourists from Mainland China in 2008, there has been an increasing influx of tourists to Taiwan on an annual basis. But after the Taiwanese alternation of political parties in 2016, the Chinese government implemented the tourist restraint policy. Consequently, the number of Mainland China tourists to Taiwan declined dramatically, which was a heavy blow to the Taiwanese tourist enterprises. But according to the statistics released by the Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017), the person-time of tourists to Taiwan slightly increased despite the decreasing number of Mainland China tourists to Taiwan. In order to explore the change to the tourists to Taiwan in recent years, this study adopted the data from the Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017) and relevant information from 2014 to 2016 to analyze microeconomic factors that affect the tourists to Taiwan such as the residence, gender, purpose, age and occupation of tourists to Taiwan, length of stay, transportation tools, and entry ports, and visitor expenditures. Finally, conclusions were drawn according to the research results, with the hope that they would be taken as reference information by the public, governmental organs and enterprises to develop the tourism in Taiwan.

2. Literature Review

Tourism means that a person travels to a place beyond his/her regular residence within a year. The purpose of traveling is not making profits in the tourist destination (Smith, 1995). According to geographic location, tourism can be divided into six types: 1) domestic tourism: the tourism of domestic people or the foreign residents in a country, also called national tourism; 2) inbound tourism: the tourism of foreign tourists in a country; 3) outbound tourism: the tourism of domestic people in other countries; 4) internal tourism: domestic tourism and inbound tourism; 5) national tourism: domestic tourism and outbound tourism; 6) international tourism: inbound tourism and outbound tourism (Smith, 1995). According to the purpose of tourism, Swarbrooke and Horner (1999) divided tourism into eleven types, namely, visit to friends, business tourism, religious tourism, health-oriented tourism, social tourism, educational tourism, landscape tourism, entertainment tourism, activity-oriented tourism, tourism for special interests, and cultural tourism. Known as “chimney-free industry”, “invisible trade” and “invisible diploma”, tourism has become increasingly important for Taiwanese economy (Huang, 2017). Since the 1980s, tourism has developed rapidly in the economic globalization and the post-industrialized transformation. As economy develops, people have paid more heed to their demand for

tourist entertainment. All governments have made tremendous effort to improve their tourist industry to attract foreign tourists, so as to make tourism output and boost their economy. Aside from enriching tourists' experience, tourism can bring economic benefits to the tourist industry, increase revenue and employment rate and enhance the acceptance of cultural values (Lankford and Howard, 1994; Wight, 1998). Moreover, it is the best way for a country to communicate with others and a policy that would bring immediate benefits. Therefore, all countries have been striving to develop their tourism to increase national and private wealth. Besides, tourism covers various industries, including hotel, catering, aviation, transportation and traveling; hence, promoting tourism fuels the development of relevant industries (Wang and Cheng, 2011). As an island country, Taiwan boasts a prosperous tourist industry and abundant tourist resources, which are supplemented by the unique geographic features, natural resources, diverse cultures, historical relics, national parks and regional entertainment areas. The government must adopt proper planning and management to prevent pollution or the abuse of resources, for environment plays a key role in the tourist development (Piga, 2003). Conflict would form when the number of tourist reaches certain level. The more significant the cultural difference between local residents and tourists is, the fiercer the conflict will be (Wei et al., 1989). For that reason, the sustainable development of environment must be taken into account in the development of tourism; moreover, the tourist load analysis and the environment evaluation of tourist policy should be conducted and the policies for proper planning of tourist environment should be made. According to the Tourist Competitiveness Report 2017 released by the World Economic Forum, Taiwan ranked No.30, up from No.32 in 2015, in terms of the competiveness of tourist industry; meanwhile, the score of its tourist competitiveness index increased from 4.4 to 4.5. Although Taiwan have invested abundant resources in the protection and recovery of environment in recent years, the actual development and the attraction to international tourists have not been enough to form important factors. To address these problems, the government-resident cooperation system needs to be improved so that Taiwan's future tourist industry will not only benefit from complete infrastructure but also take sustainability as the attraction to more international tourists, so as to realize the objectives of environmental sustainability and industrial development (Yeh, 2017).

Tourism can be divided into domestic tourism and international tourism. Both share such direct consumption items as transportation, shopping, catering, accommodation and the tickets of tourist destinations; hence, they are highly essential for economy and society. International tourism, however, outweighs domestic tourism for increasing foreign exchange revenue and creating job opportunities (Wang and Cheng, 2011). The main economic benefits brought by tourism include promoting rural economy, narrowing the gap between urban and rural areas, improving international balance, increasing national income, creating job opportunities, reinforcing economic structure, stimulating entrepreneurial investment and raise government income. Economic costs include the cost of land opportunity, inflation, the overdependence on tourism, and the increase in fiscal expenditure (Chen, 1995). Since China's reform and opening-up, the living standards and financial conditions of Chinese people have improved significantly. As the restraints on overseas tourism become increasingly loose and the government encourages people to travel abroad, the large quantity of Mainland China tourists and their amazing consumption capacity have caught the great attention of the global tourist market (Chang, 2009). The overall stable growth of revenue in Taiwan's tourism in recent years has been mainly attributed to the remarkable foreign exchange revenue brought by its international tourism. But since the alternation of political party in 2016, the Chinese government has implemented the policy of restraining Mainland China tourists to Taiwan, which has caused great impact on the Taiwanese tourist enterprises.

3. Research Methodological

This study adopted the data from the Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017) and relevant information from 2014 to 2016 to analyze microeconomic factors that affect the tourists to Taiwan such as the residence, gender, purpose, age and occupation of tourists to Taiwan, length of stay, transportation tools, and entry ports, and visitor expenditures.

3.1 Residence

As for the residence of the tourists to Taiwan, relevant data in 2016 (see Table 1 which merely shows the countries which had had over 100,000 person-times of tourists to Taiwan for three consecutive years) reveal that Mainland China had ranked the first for three years in row. But the person-times of 2016 were significantly less than that of 2015 (by about 670,000 person-times). Japan, ranking the second, reached a new height in 2016 (with approximately 1.9 million person-times). Growth was also found in Hong Kong and Macao and South Korea, which ranked the third and the fourth respectively. It is noteworthy that eight of the top 9 regions in 2016, except Mainland China, witnessed an increase compared with that in 2015. Except the US, the remaining seven were in Asia. Therefore, the Taiwanese government can focus its tourist marketing on Asia and Europe, especially the US.

3.2 Gender

In terms of gender (see Table 2), there was little change from 2014 to 2016, with the female tourists outnumbering the male ones by about 5%. As far as the person-time over the three years is concerned, there was a gradual increase for both male and female tourists.

Table 1. Visitor Arrivals by Residence (Unit: Persons)

Year	Mainland China	Japan	Hong Kong. Macao	Korea	U.S.A.	Malaysia	Singapore	Vietnam	Thailand
2014	3,987,152	1,634,790	1,375,770	527,684	458,691	439,240	376,235	137,177	104,812
2015	4,184,102	1,627,229	1,513,597	658,757	479,452	431,481	393,037	146,380	124,409
2016	3,511,734	1,895,702	1,614,803	884,397	523,888	474,420	407,267	196,636	195,640

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

Table 2.Visitor Arrivals by Gender (Unit: Persons)

Year	Total	Male		Female	
		No. of Visitors	% of Total	No. of Visitors	% of Total
2014	9,910,204	4,713,189	47.56	5,197,015	52.44
2015	10,439,785	4,903,557	46.97	5,536,228	53.03
2016	10,690,279	5,028,499	47.04	5,661,780	52.96

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

3.3 Purpose of Visit

When it comes to purpose of visit (see Table 3), there was little change during the period (from 2014 to 2016), with "Pleasure" being the main purpose, and over 7.5 million person-times were for "Pleasure" for the past two years. Except "Others", other purposes were dominated by "Business" and "Visit Relatives".

Table 3. Visitor Arrivals by Purpose of Visit (Unit: Persons)

Year	Total	Business	Pleasure	Visit Relatives	Conference	Study	Exhibition	Medical Treatment	Others
2014	9,910,204	769,665	7,192,095	393,656	63,135	56,562	13,316	60,951	1,360,824
2015	10,439,785	758,889	7,505,457	408,034	60,777	59,204	13,749	67,298	1,566,377
2016	10,690,279	732,968	7,560,753	428,625	64,704	67,954	14,876	38,260	1,782,139

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

3.4 Age

As for age (see Table 4), there was little change from 2014 to 2016, with the largest proportion for those aged from 30 to 39, followed by those aged from 20 to 29 and those aged from 40 to 49. What deserves attention is that there was an annual increase for the above three age groups in the past three years, while there was decline in two age groups – from 50 to 59 years and 60 years and over.

Table 4. Visitor Arrivals by Age(Unit: Persons)

Year	Total	9 years and Under	10-19 years	20-29 years	30-39 years	40-49 years	50-59 years	60 years and Over
2014	9,910,204	313,479	525,014	1,844,889	1,988,524	1,807,090	1,733,548	1,697,660
2015	10,439,785	366,358	575,074	2,014,944	2,126,664	1,885,288	1,778,173	1,693,284
2016	10,690,279	397,178	603,564	2,214,660	2,250,830	1,925,259	1,710,215	1,588,573

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

3.5 Occupation

In term of occupation (see Table 5), except "Others" and "Unstated", "Merchant & Salesman" accounted for the largest proportion from 2014 to 2016, followed by "Housewife & Retired", "Cultural Personnel" and "Secretary & Clerk". But in recent years, more person-times were found in "Housewife & Retired" and "Cultural Personnel".

Table 5. Visitor Arrivals by Occupation (Unit: Persons)

Year	Total	Merchant & Salesman	Secretary & Clerk	Technical Personnel	Cultural Personnel	Housewife & Retired	Military & Gov't	Others	Unstated
2014	9,910,204	1,350,409	892,623	952,341	661,812	917,904	78,899	727,436	4,328,780
2015	10,439,785	2,531,590	905,580	243,996	1,065,357	1,496,702	101,079	1,206,280	2,889,201
2016	10,690,279	2,271,966	1,027,392	261,724	1,215,716	1,396,148	120,431	1,227,277	3,169,625

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

3.6 Length of Stay

When it comes to length of stay (see Table 6), the average length was about 6.5 days from 2014 to 2016, or about a week. What is noteworthy is that there were over 90 nights and more than 770,000 person-times since 2016. A longer stay would bring a higher consumption account. Therefore, measures should be taken to increase the length of foreign tourists' stay.

3.7 Mode of Transport & Port of Entry

As far as Mode of Transport & Port of Entry is concerned (see Table 7), "Air" took up the largest proportion, with TTY playing a dominant role and an annual increase. What followed were Kaohsiung and Sung-Shan, but their person-times declined. For Sea, Keelung played a main role, but there was decline in all ports in 2016.

Table 6. Visitor Arrivals by Length of Stay (Unit: Persons)

	Length of Stay (Nights)												
Year	1	2	3	4	5-7	8-15	16-30	31-60	61-90	90 以上 Over 90 Nights	Total Visitor Nights	Total Visitors	Average Length of Stay (Nights)
2014	367,960	1,006,103	1,603,769	1,086,354	3,767,672	855,893	224,189	121,610	76,302	-	60,584,406	9,109,852	6.65
2015	436,655	1,096,801	1,677,216	1,091,805	3,852,206	984,321	225,645	120,792	83,093	-	63,486,144	9,568,534	6.63
2016	496,369	1,284,085	1,982,823	1,213,786	3,301,663	1,038,151	239,891	129,142	90,980	772,027	63,448,456	9,776,890	6.49

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

Table 7. Visitor Arrivals by Mode of Transport & Port of Entry (Unit: Persons)

Year	Total	Sea					Air					
		Sub-total	Kee-lung	Tai-chung	Kao-hsiung	Others	Subtotal	Sung-Shan	TTY	Tai-chung	Kao-hsiung	Others
2014	9,910,204	478,414	85,474	21,308	75,500	296,132	9,431,790	852,176	7,318,335	328,377	885,742	47,160
2015	10,439,785	600,432	68,473	33,884	64,347	433,728	9,839,353	876,794	7,570,823	395,613	936,297	59,826
2016	10,690,279	529,001	54,125	15,134	34,586	425,156	10,161,278	858,616	7,985,330	324,995	944,674	47,663

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

3.8 Visitor Expenditures

As for Visitor Expenditures (see Table 8), the number of visitors became larger from 2014 to 2016, but visitor expenditures declined. Moreover, decline was also found in "Spending Per Person", "Spending Per Person Per Day", and "Average Length of Stay (Nights)". The decline might be the result of the decline in "Average Length of Stay (Nights)".

Table 8. Visitor Expenditures

Year	No. of Visitors	Visitor Expenditures (US$)	Growth Rate (%)	Index 1991=100	Spending Per Person (US$)	Spending Per Person Per Day (US$)	Average Length of Stay (Nights)
2014	9,910,204	14,615,000,000	18.61	724.23	1,474.70	221.76	6.65
2015	10,439,785	14,388,000,000	-1.55	712.98	1,378.18	207.87	6.63
2016	10,690,279	13,374,000,000	-7.05	662.74	1,251.08	192.77	6.49

Source: Tourism Bureau, Ministry of Transportation and Communications, Republic of China (Taiwan) (2017)

4. Results and Discussion

As a whole, most of the tourists to Taiwan from 2014 to 2016 were from Asia in terms of residence, and those from Taiwan accounted for about 40% of the total number of tourists to Taiwan. In terms of gender, females occupied 53%. For "Purpose of Visit", those seeking "Pleasure" took up about 75%. As far as "Age" is concerned, those aged from 20 to 39 accounted for about 44%. As for "Occupation", except "Others" and "Unstated", "Merchant & Salesman" accounted for the largest proportion from 2014 to 2016, followed by "Housewife & Retired", "Cultural Personnel" and "Secretary & Clerk". But in recent years, more person-times were found in "Housewife & Retired" and "Cultural Personnel". When it comes to length of stay, the average length was about a week. As far as Mode of Transport & Port of Entry is concerned (see Table 7), "Air" took up the largest proportion, with TTY playing a dominant role and an annual increase. For Sea, there was trend of decline. As for Visitor Expenditures, the number of visitors became larger from 2014 to 2016, but visitor expenditures declined. Moreover, decline was also found in "Spending Per Person", "Spending Per Person Per

Day", and "Average Length of Stay (Nights)". The decline might be the result of the decline in "Average Length of Stay (Nights)". Finally, this study gave the following suggestions:

(1) The number of tourists has been rising dramatically worldwide, especially in Asian-Pacific region. Tourism has become a new economic development trend in the world as well as one of major projects of new economic development. Of the top 10 tourist source countries, Japan, China and Russia surround Taiwan. Such a large number of potential tourists provide new opportunities for Taiwan to develop international tourism. As the restraint on Mainland China tourists to Taiwan has loosened in recent years, Taiwan has witnessed immediate business opportunities in its tourist industry. But it still needs to attract international tourists if it expects sustainable development of its tourism. Aside from offering fascinating landscape, it needs to impress tourists with professional services which can only be provided by competent service professionals of the tourist industry. Only in this way will it be able to hold the attention of tourists for long (Wang and Cheng, 2011). Additionally, most Taiwanese people are kind and hospitable and local residents have established a positive interaction with tourists, which plays a key role in the development of Taiwan's tourism (Allen et al., 1993). Hoffman and Low (1981) Equipped with abundant and diverse cultural resources and geographic environments, Taiwan has tremendous development potentials. Besides, the government has made supportive policies on tourism and some preferential schemes to attract tourists, which has promoted the economic benefits of many areas.

(2) Many of tourists to Taiwan would come to Taipei; hence, relevant governmental units should improve the regional planning of sightseeing routes so that more international tourists will have an in-depth visit to the regions beyond Taipei.

(3) As an island country, Taiwan has a prosperous tourist industry and many famous scenic spots in the subtropical zone. In the future, Taiwan should direct its efforts to develop the maritime tourist and entertainment industry, giving full play to its tourist strengths as a maritime country.

(4) Currently, China is restrain its tourists from visiting Taiwan and reducing the number of flights, which has indirectly led to a smaller number of Hong Kong and Macao tourists to Taiwan and caused some impact on the Taiwanese tourist industry. This problem could only be addressed through the cross-strait negotiation. But as far as the tourists from other regions are concerned, the tourists from 59 designated countries can enjoy a free visa (Bureau of Consular Affairs, Ministry of Foreign Affairs, Republic of China (TAIWAN), 2017). Despite this, those from other countries which cannot enjoy the free visa still need to go through the complicated procedure and must apply for one in the local Taiwanese embassy. This problem weakens their intention of visiting Taiwan and appears to be an obstacle for Taiwan to attract international tourists. In the future, Taiwan should continue to spread the free visa to a greater number of countries to make it more convenient for international tourists to visit Taiwan.

(5) The "MICE" in the exhibition industry is short for Meetings, Incentives, Conventions and Exhibitions. The prosperity of the exhibition industry can be viewed as an index of a country's economic development. In recent years, many Taiwanese colleges and universities have established tourism-related departments to improve tourist services and trained exhibition professionals. By doing so, they intend to equip a greater number of students with advanced education and enhance the competence of the professionals in the whole industry. The exhibition industry is a focus in Taiwanese service industry. In recent years, the annual output of the Taiwanese exhibition industry has exceeded USD 1 billion. Moreover, the industry is an export platform, and Taiwan's overseas exhibitions have brought its important export performance. Besides, Taiwan has attracted meeting organizers, overseas buyers and business people and encouraged corporate meetings, so as to increase their consumption in Taiwan. Hence, if exhibition is combined with tourism, the benefits brought by the combination will be tremendous. In the future, Taiwan should not only improve the access to regional and surrounding facilities and services but also integrate exhibition with regional characteristics, industrial cluster features to generate accurate market segmentation, so as to strengthen the international competitiveness of its exhibition industry.

(6) The Summer Universiade 2017 in Taiwan was a great success. Influential sports events can enhance a country's popularity and upgrade its software and hardware. Such events would boost the economy and building of the host city and promote business development and opportunities through sport marketing and industrial connection. Moreover, they would attract foreign athletes and sport fans to Taiwan, fueling Taiwan's tourist industry and creating economic benefits for surrounding areas. For these reasons, Taiwan should be active to hold influential sports events to increase its tourist benefits.

(7) In the era of the Internet and big data, future studies can add the analysis of consumption data in the model

so that foreign tourists can receive more accurate marketing information that meets personal consumption habits and interests. In addition, the combination of electronic business, telecommunication, the Internet of Things and the tourist industry should be enhanced to inform international tourists of Taiwanese characteristics. The Taiwanese consumption market will be expanded if Taiwan attracts more foreign tourists. If the information hardware, which Taiwan excels in, is combined with the demand for tourist services, international tourists will have an amazing experience, which will earn Taiwan a high reputation in the world and strengthen the international competitiveness of the Taiwanese tourist industry (Yeh, 2017).

(8) In the future research, since this study only analyzes data from 2014 to 2016. The future can be analyzed more periods to find out more. Such as can divided into three periods: until 2008, 2008-2016 and after 2016.

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How International Political Conflict Hurts Country Image and further Influences Consumers' Purchase Intention

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Abstract

Recently, South Korea's decision to deploy an advanced U.S. missile defense system has drawn neighboring China's strong protests. Amid this political tension between both countries, the purpose of this study is to explore the relationship between this specific political conflict and consumers' purchase intention. Based on previous literature, this study suggests a research model that defines the relationship between international political conflict, country image (i.e., affective country image and cognitive country image) and purchase intention. Proposed hypotheses suggest that international political conflict between foreign firms' host and home countries is negatively associated with consumers' purchase intention toward foreign firms' products in the host country by hurting cognitive and affective image of the home country. This study contributes to understanding the underlying mechanism on how international political conflict influences consumers' purchase intentions.

Keywords: international political conflict, affective country image, cognitive country image, consumers' purchase intention

1. Introduction

Since the establishment of South Korea-China diplomatic ties in 1992, South Korea and China have cooperated closely and made rapid development in various fields, such as tourism, trade, cultural exchange and so on. In 2015, annual trade volume between South Korea and China amounted to US$ 227.3 billion, 40 times what the US$ 5 billion it was at the start of diplomatic relations. On July 8, 2016, South Korea announced the decision to deploy the THAAD (Terminal High Altitude Area Defense), an advanced U.S. missile defense system. The Korean government has tried to emphasize that THAAD will serve as a safeguard to counter North Korea's missile threat, whereas the Chinese have perceived it as a threatening factor which is aimed to impair Chinese security interests, and therefore strongly opposed the system. To express strong objection, the Chinese state media and social network have criticized South Korea's decision over the issue, thus triggering rising discontent of Chinese towards Korea. Similarly, in 2012, China and Japan disputed over a chain of islands known as the Diaoyu in Chinese, putting the diplomatic relations between these two countries on ice. This was followed by China's boycott of Japanese products due to this territorial conflict between both countries (Wang, Li, Barnes, & Ahn, 2012), which had a strong negative impact on bilateral trade, resulting in a one-year trade disruption of 2.7% (Heilmann, 2015).

In this way, international political conflicts are not only associated with political relationships, but also can influence economic and cultural activities between countries. Previous academic literature has also explored the results of international political conflicts in various areas such as trade, foreign direct investment, tourism, and cultural collaboration (Alvarez & Campo, 2014; Heilmann, 2015; Huang, Wu, Yu, & Zhang, 2015; Kastner, 2007). However, little is known about the impact of international political conflict on the individual consumers' purchasing behaviors. In today's interconnected world, more and more ordinary people are concerned by international events due to their wide dissemination through media and other channels. Therefore, it is expected that international political conflicts between countries not only hurt political relationships, but also influence an individual person's perception of a nation's image and their purchasing intention for the products produced by the nation in conflict. This, in turn, impact foreign firms' sales performance due to the conflicts between host country and home country. Consequently, it is important to investigate how such international political conflicts influence foreign firms' sales performance in the host country. Thus, this study aims to examine the relationship

between international political conflicts and consumers' purchase intention in the host country. Further, this study would explore how the country image that includes affective country image and respect and reputation plays a mediating role in the mechanism mentioned above. We believe our research on the impact of political conflicts on consumers' purchase intention would provide insights for foreign firms' risk management when unexpected political conflicts arise between host country (or trading country) and home country, and also extend our understanding about why political conflicts influence trade at the macro-economic level.

2. Literature Review and Hypotheses Development

2.1 Country Image

Country image has always been regarded as a multi-dimensional concept (Han, 1989), including economical, technological, political and social variables of a country (Verlegh & Steenkamp, 1999). In general, in wider perspectives, country image has been defined as "the total of all descriptive, inferential and informational beliefs one has about a particular country" (Martin & Eroglu, 1993), or "a simplification of large number of associations and pieces of information connected with a place" (Kotler & Gertner, 2002). Put simply, country image refers to the attitudes that people of one country hold toward another one (Maher & Carter, 2011). Some scholars have paid more attention to country image's relation with product recognition (Agarwal & Sikri, 1996; Roth & Romeo, 1992), redefining country image as consumer's understanding of a specific country based on recognition of manufactured and marketed products from that country (Roth & Romeo, 1992).

According to recent literature, country image comprises both cognitive and affective components. The cognitive dimension of country image refers to consumers' beliefs of a country, incorporating levels of economic development, living standards, industrialization, technological advancement and so forth (Wang et al., 2012), whereas affective country image includes emotions and feelings regarding a country as well as its people. Both components of country image are particularly distinct yet interrelated (Maher & Carter, 2011). Additionally, people simultaneously hold inconsistent cognitive evaluations and affective ones toward a single country. For instance, Chinese have held a low affective country image of Japan for unclearly resolved historical problems and ongoing crises, but they subconsciously perceive Japan as a creative and advanced country, producing high-quality technical products. Wang et al. (2012) put forwards multiple comparisons of cognitive country image and affective country image of USA, Germany, Japan and Korea from Chinese perspectives, with the result showing that among the above countries, Korea was perceived to be relatively lower in cognitive country image, but tied Germany for highest affective country image. Some studies have also advocated conative evaluation of country image, which is defined as the behavior of the individual of the place (Alvarez & Campo, 2014). However, the current consensus has agreed that country image can be evaluated by affective and cognitive dimensions, so in this paper, we will not take the conative component into consideration.

2.2 International Political Conflict and Country Image

International political conflict generally arises as a result of policy changes, government instability and other political forces across nations (Huang et al., 2015), essentially rooted in incompatible conflict of interest of respective nations. Numerous actual events concerning international political conflict have put forwards evidence that international political conflict negatively affects the image of the country involved. For instance, Alvarez and Campo (2014) addressed the conflict between Israel and Turkey. In May 2010, the Israeli military killed eight Turks and one Turkish-American aboard a Gaza-bound ship, the Mavi Marmara, which disregarded Israel's warning against entering their territory. The incident enraged Turks, whose nation suffered the most casualties, giving rise to strong Turkish animosity towards Israel. Alvarez and Campo (2014) compared the image of Israel from Turkish perspectives before and after the Mavi Marmara incident. They confirmed that Turks already held a very negative image of Israel even before the event, and the initial negative evaluation of Israel worsened after the conflict, especially in terms of feelings and emotions. In contrast, the Turks' opinion regarding Israel's level of technological, economic and industrial development became more positive, but this could not remedy the huge damage to Israel's overall country image. Analogously, in 2012, as the Diaoyu Islands conflict escalated, China-Japan relations deteriorated drastically, harming the images of both countries. In 2013, a Sino-Japan joint public opinion poll conducted by China Daily and Japanese Genron NPO suggested that more than nine tenths of the citizens of each country holds a bad image regarding the other country. As a result, diplomatic conflict between two countries could be a general public issue, affecting citizens' valuations and attitudes of the other country negatively. Animosity—defined as the remnants of antipathy related to previous or ongoing military, political, or economic events (Klein, Ettenson, & Morris, 1998), plays a very important role in citizens' change of perceptions and preference towards a specific country. Instead of feeling "grievous and difficult to forgive"(Klein et al., 1998), they show animosity to reach a goal, for instance, to force a specific

country to modify a policy and to protect their own interests. The influence of situational animosity on country image is temporary reducing with time, and some researchers found that, in the absence of new events and media attention to reinforce the negative image, the image returns to levels similar to those before the incident (Heslop, Lu, & Cray, 2013). Even so, the temporary negative image could bring enormous economic loss and is likely exacerbate the conflict if not properly handled.

Before the emergence of THAAD, in recent years, the "Korean wave" from South Korea swept China by launching attractive and fashionable stars in various forms, amassing enormous numbers of Chinese fans. On the other hand, Korea's electronic and automotive technology has developed rapidly and companies, led by Samsung, LG, Hyundai along with their products, have been highly regarded in the Chinese market. Certainly, Korea has step by step gained a very positive country image in Chinese consumers' perceptions, both in affective and cognitive evaluations. Nevertheless, as the THAAD conflict broke out, things changed drastically. At first, the Chinese government attempted to persuade Korea to modify its decision to deploy THAAD. Subsequently, extensive media coverage reported on it and of course depicted it negatively, driving individual Chinese consumers' animosity towards Korea. Thus, we posit following hypotheses:

Hypothesis 1: International political conflict between foreign firms' host and home country is negatively associated with cognitive image of foreign firms' home country in the host country.

Hypothesis 2: International political conflict between foreign firms' host and home country is negatively associated with affective image of foreign firms' home country in the host country.

2.3 Country Image and Consumers' Purchase Intention

A great amount of empirical observations and experiments have been made to discover how country image influences consumers' purchase intention. According to the previous studies, consumers often intensively feel that country of origin is changing their perspectives and evaluations towards product, subsequently playing a significant role in their decision to purchase. For instance, consumers are most willing to buy products from economically developed free countries (Wang & Lamb, 1983). The country image effect is much more significant when the consumer is not familiar with a specific country's product, being defined as halo effect (Lin & Chen, 2006). This would not only affect the consumer's trust in the product, but also affect the consumer's overall evaluation of the product (Johansson, Douglas, & Nonaka, 1985). However, both types of country image (i.e., cognitive and affective country image) influence consumers' purchasing intention with different ways.

Firstly, cognitive and affective country image influences purchase intention through quite different mechanisms. Findings suggested that affective country image tends to have a more direct effect on purchase intention compared to cognitive one (Maher & Carter, 2011; Roth & Diamantopoulos, 2009). Since the former is relatively independent with products, but related to consumers' personal feelings towards the firms' country, such as animosity, favor, which can directly make up consumers' minds in a sudden. Alternatively, cognitive country image influences purchase through product image (Wang et al., 2012). As product images are conceived as consisting of an array of information cues, both intrinsic (taste, design, fit) and extrinsic (price, brand name, warranties) (Bilkey & Nes, 1982). And cognitive country image can provide with some of these information cues (Wang et al., 2012), thereby affecting product image invisibly.

Secondly, affective and cognitive country components do not always have an equivalent effect on purchase intention (Maher & Carter, 2011). Affects and cognitions have impacts on different parts or types of the products. For instance, affective country image tends to determine action tendencies toward hedonic objects whereas cognitive country image influences action tendencies toward functional objects (Verlegh, 2001). Furthermore, they have different intensities of impact on purchase intention. Researchers have found that when a country's image has a strong affective component, its impact on product evaluations is stronger than its impact on product beliefs. Alternatively, when a country's image has a strong cognitive component, its direct influence on product evaluations was smaller than its influence on product beliefs (Laroche, Papadopoulos, Heslop, & Mourali, 2005). To be specific, as mentioned above, during the territory conflict in 2012 related to Diaoyu Island, Chinese consumers' boycott of Japanese products appeared differently based on the product types. For functional products like electronic products and camera, even though there were extreme customers who destroyed their own Japanese cameras, many consumers still considered buying Japanese products based on the cognitive image of the country, therefore sales didn't waver a lot. On the other hand, for hedonic products, like fashion items, received a strong impact. Japanese fashion brand Uniqlo was boycott in China for a few months, and because the animosity toward the brand became too strong, they were forced to use a different shopping bag that has no logo on it. Moreover, while 30% of its store in China were close for a few weeks some stores also had to hide their brand logo. So now we are

going to proceed further research on the decomposing effects of country image on purchase intention. As mentioned above, cognitive country image is less likely to be affected by political conflict compared with affective one, moreover, according to the research conducted on the topic of political issue between Turkey and Israel, it is found that Turks' opinion regarding Israel's level of technological, economic and industrial development part of cognitive country image even became more positive (Alvarez & Campo, 2014). As a result, this paper will reduce the scope of cognitive country image and focus on the reputation and admiration part of cognitive country image, excluding the rest.

The study conducted by Yang asserted that country's reputation is a subject of increasing interest for the practice and research of public relations and public diplomacy and it could have certain influence on foreign publics' supportive intentions toward the country (Yang, Shin, Lee, & Wrigley, 2008). Based on it, we can speculate that country's reputation can influence consumers' purchase intention. With respect to the influence of admiration towards a country, Maher, Clark, and Maher (2010) carried out investigation targeting Japanese product while Baillargeon (2004) conducted study about Argentine consumers' admiration towards the U.S and Canada. Both of them revealed that admiration towards a certain country is positively related to its products, in other words, admiration can positively affect both product evaluation and willingness to buy. In sum, there are sufficient existing literatures support the hypothesis on admiration and reputation's influence on purchase intention.

When it comes to the influence of affective country image towards purchase intention, at first, we will discuss the influence channeled through animosity. Up to now, many scholars have worked on the animosity model of foreign product purchase in diverse settings. For example, Klein et al. (1998)tested the model by using mainland Chinese consumers' attitudes towards Japanese products. Likewise, the boycott of French products by Australian and New Zealand consumers resulted from the nuclear tests by France in the South Pacific was also observed (Ettenson & Gabrielle Klein, 2005). The study investigated the negative effect of consumer animosity on the purchase behavior of Egyptian consumers regarding Israeli products (Mostafa, 2010). These studies showed that animosity can be negatively associated with product evaluations, leading to weaker purchase intention and even boycotts. Although Japan, France, the U.S and some other developed countries are well-known for their high product image and quality, it is still possible that consumers feel resistance to their products. It is because the effects of animosity act on consumers' minds independently of products' judgement (Shin, 2001). Except animosity, there are lots of emotional factors that contribute to the effects of affective country image, such as anger, contempt, pity, alert, resistance and so on. These factors could not be enough to facilitate a boycott, but absolutely can make consumers to think twice before buy the products or take another product from other countries into consideration. Thus, we posit following hypotheses:

***Hypothesis 3*:** Cognitive image of foreign firms' home country is negatively associated with consumers' purchase intention in the host country.

***Hypothesis 4*:** Affective image of foreign firms' home country is negatively associated with consumers' purchase intention in the host country.

2.4 Mediating Role of Country Image

Based on above hypotheses, both affective country image and cognitive country image function as important mediating factors by transferring the effect of international political conflict to consumers' purchase intention. International political conflict is expected to hurt affective country image and cognitive country image, and these country images are further expected to have negative impacts on consumers' purchase intention. In sum, previous literature and practical cases could lead to a hypothesis that international political conflict negatively influence consumers purchase intention through hurting affective and cognitive country image. Thus, this study posits following hypotheses:

***Hypothesis 5*:** International political conflict between foreign firms' host and home country is negatively associated with consumers' purchase intention in the host country by hurting affective image of home country.

***Hypothesis 6*:** International political conflict between foreign firms' host and home country is negatively associated with consumers' purchase intention in the host country by hurting affective image of home country.

In addition, compared with affective image, cognitive image is more likely to be weakly dependent on political conflict. Therefore, previous studies argued that the influence of political incidents on the country image is greater with respect to its affective image than to its cognitive image (Alvarez & Campo, 2014; Edwards, 1990). We also suggest that mediating effects of cognitive image and affective image on the relationship between international political conflict and consumers' purchase intention are different, and thus his study posit following hypothesis:

***Hypothesis 7*:** Affective image of foreign firms' home country transmits a stronger effect from international political conflict between foreign firms' host and home country to consumers' purchase intention in the host country than does cognitive image of home country.

Figure 1 presents a conceptual research model that explains the interrelationship among international political conflict, country image and purchase intention.

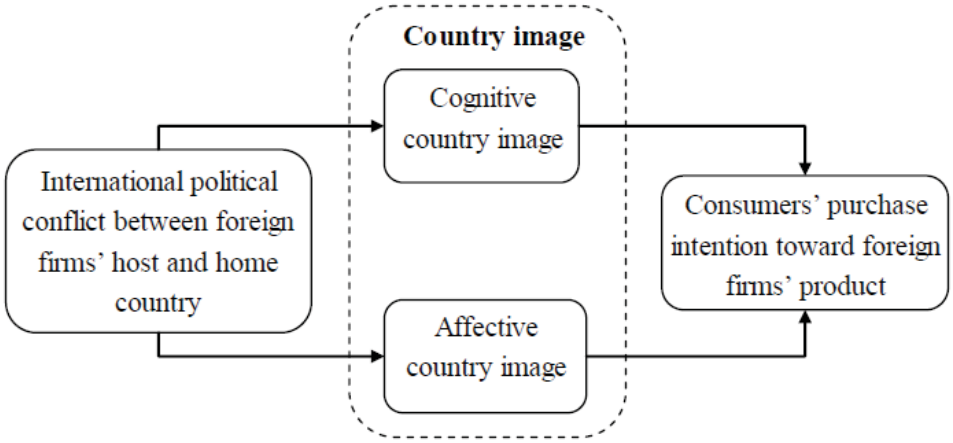

Figure 1. Conceptual research model

3. Discussions

This study proposes a research model that addresses how international political conflict hurts both affective and cognitive country image that further influences consumers' purchase intention. This study contributes to the literature on consumers' purchase intention by providing better understanding of how international political conflict hurts country image, and how different types of country image functions as a mechanism through which international political conflict affects consumers' purchase intention.

Previous studies on Chinese market from the perspective of Korean firms, researchers emphasized the positive impact of Korean cultural factors and marketing strategies using "Korean wave" on the market performance in China due to relatively good Korean country image in China (Hong & Liu, 2009; Rho, 2013; Yoo, Jo, & Jung, 2014). For instance, many Korean firms operating in China have used various commercials that hired Korean famous actors in order to penetrate Chinese market more efficiently. However, such measures are not likely to produce positive market performance when occurring international political conflict between both countries such as recent THAAD issue. Our research model reveals that international political conflict between foreign firms' home country and host country can hurt home country images in the host country and further influence consumers' purchase intention toward foreign firms' product. Therefore, if Korean firms try to use Korean country image in their marketing, it would more seriously frustrate Chinese consumers' purchase intention toward their products.

The firms from advanced country have been taking advantage of the emerging markets such as China and India by using their good image of their home country, since consumers are more likely to have good image toward these firms' products. However, such benefits are not always guaranteed. For the firms operating their business globally, international political conflicts are not predetermined and also become inevitable risk factors in doing their business. In the situation of international political conflict between countries, foreign firms need to more focus on product quality and better service providing in order to minimize the influence of bad country image and maintain consumers' purchase intention, instead of using country image that was positive impact on their business in good relationship between home and host countries.

In addition, mediating effects of cognitive image on the relationship between international political conflict and consumers' purchase intention is greater than those of affective image on this relationship. In other words, international political incidents between foreign firms' home and host countries has greater effect on the affective country image than does on the cognitive country image, and further influence consumers' purchase intention toward foreign firms' products in the host country. Therefore, firms operating their business in the host country that has political conflict relationship with their home country need to avoid some measures that utilize affective image of their home country.

4. Conclusions

By proposing a research model that addresses the relationship between international political conflict, country image and consumers' purchase intention, this study provides useful insight in the ways that firms operating their business globally understand how international political conflict influences consumers' purchase intention toward their products. This study focuses on two types of country image (i.e., affective image and cognitive image) and emphasizes that different country image has different mediating effect between international political conflict and consumers' purchase intention. Country image as a transmitting mechanism between international political conflict and consumers' purchase intention can act as a double-edged sword, leading to positive consumer outcomes under good relationship between countries as well as negative consumer outcomes in the situation of international political conflict.

Since economic growth in emerging market outpaced developed markets, many international corporations are trying to enter emerging markets like China and India. The investment of the United States and Europe to China was increased by 52.6% and 41.3% each in 2016. However, such companies operating in the foreign countries need to be careful about the political conflicts between those countries, because it is hard to predict the political conflicts that will occur in the future, and of course people's reaction toward the issue. Therefore, knowing how to cope with the problems caused by political conflict between their home country and host country is becoming a crucial competence in order to survive and thrive in the host country. Thus, this study will also explore the mechanisms that can help companies prepare for the potential loss due to future political conflicts. Therefore, it would be worth further investigating how foreign firms cope with risk factors caused by international political conflict between their home country and host country, thus providing more useful implications in the ways that such firms deal with bad country image of their home country. For instance, when a company tries to enter an emerging market, especially those countries with potential political conflicts, it might be better to choose localization strategy to penetrate the market.

In addition, considering these disparate outcomes of country image, further studying the relationship between country image and consumers' purchase intention by adopting moderating variables between this relationships, would be an interesting approach to expand our understanding of how to deal with county image for enhancing consumers purchase intention. Future research will explore the dynamic characteristics of the impact of international political conflict on the consumers purchasing intention and firm-level performance in the host country that has conflict with their home country.

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Traditional Governance and Innovative Strategies in Italian Family SMEs: Evidence from Tuscany

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Abstract

Governance in family businesses is a relatively recent research topic in the field of management studies. Much research has sought to shed light on the factors that shape the relationship between governance structures and corporate strategies. Nevertheless, very little research has specifically addressed the relationships between the configuration of the Board of Directors and the firm's willingness to carry out innovative strategies. Our study aims to shed light on the relationship between the corporate governance structures and the pace of innovation within family SMEs. Evidence from three family-owned SMEs located in Tuscany (Italy) highlights that a traditional type of governance structure can co-exist with the search for innovative strategies and that the intensity of the innovation processes may not be tied to the Board's composition.

Keywords: family SMEs, innovation, governance, Board of Directors

JEL Code: L22, L25, M10

1. Introduction

Governance in family businesses is a relatively recent research topic in the field of management studies. Initially, theoretical and empirical research focused mainly on the differences between family and non-family businesses as regards governance choices, organizational behavior, and performance. Later, the analysis went further, to better understand the peculiar characteristics of corporate governance in family businesses, often with a normative aim.

The topic of innovation is no less considered in the literature on family business. This area was mainly addressed by considering two aspects: the impact that family involvement in property and management can have on the innovative capacity of firms and, for SMEs, both the limitations deriving from smaller sized businesses, as well as the opportunities for pursuing innovation through cooperation and networking strategies.

Much research has sought to shed light on the factors that shape the relationship between governance structures and corporate strategies. Among these, the influence of the generational change on the degree of homogeneity/heterogeneity of ownership (Kellermanns & Eddleston, 2006) and the issue of the professionalization of the family management (Hall & Nordqvist, 2008; Dekker, Lybaert, Steijvers, & Depaire, 2015) seem to hold special meaning. Moreover, a number of studies have investigated the impact of governance structures on innovation (Hoskisson, Hitt, Johnson, & Grossman, 2002), as well as the impact of the composition of the Board of Directors (hereafter BoD) on internationalization (Calabrò, Mussolino, & Huse, 2009; Arregle, Naldi, Nordqvist, & Hitt, 2012; Segaro, 2012; Majocchi & Strange, 2012; Corsi & Prencipe, 2015) and on the firm's performance (Kouki & Guizani, 2015; Gonzàlez-Cruz & Cruz-Ros, 2016).

Nevertheless, very little research has specifically addressed the relationships between the configuration of the BoD and the firm's willingness to carry out innovation strategies. Some scholars have just recently called for the development of this area of inquiry (De Massis, Chirico, Kotlar & Naldi, 2014; Chrisman, Chua, De Massis, Frattini & Wright, 2015), arguing that the configuration of the firm's governance structure may influence its engagement in innovation activities.

Our study aims to shed light on the relationship between the corporate governance structures and the pace of innovation within family SMEs. We wonder if and to what extent the governance structure in family SMEs, with

particular reference to the BoD, can influence their innovative capacity and the implementation of innovation strategy.

The analysis of three family-owned SMEs located in Tuscany (Italy) offers some insights on this debate. We focus on the composition and the dynamics of the BoD, as regards the presence of non-family members, the ratio of family/non-family members, and their role in co-determining the innovative pace of the firm.

Evidence from the three firms highlights that a traditional type of governance structure - which does not provide for the participation of members external to the family on the Board - can co-exist with the search for innovative strategies and that the intensity of the innovation processes may not be tied to the Board's composition. In sum, our findings question the results of previous studies, as regards the existence of a "best configuration" of the BoD for pursuing the firm's innovation.

In the following paragraph we briefly illustrate the theoretical background; in section 3 we outline the research objectives and methodology; in section 4 we offer a brief description of the firms analyzed; in section 5 we outline and debate the results of our analysis; and lastly, in section 6 we draw some conclusion and point out the main limitations of the research.

2. Theoretical Background

2.1 Governance Assets in Family SMEs

Studies on governance in family businesses have evolved over time along some main paths. Research on the impact of governance structures and mechanisms on business performance developed towards the end of the 1980s (Pieper, 2003) although the focus on family SMEs is much more recent. A stream of literature pointed out the need for a dual structure of governance for the family firm: one for managing the family, and one for managing the business. At the same time, these studies focused on the characteristics of the BoD and suggested some guidelines for its establishment.

According to Miller-Le Breton Miller (2005) the position of Board member should be attained through the acquisition of some specific skills, and not simply by virtue of inheritance. Board members should manifest different but complementary skills; moreover, they should not be merely the expression of the family (diverse families or family branches), thus ensuring a balance between family and business perspectives.

The importance of non-family members' involvement inside the Board - the so-called "outsiders" - is one of the most oft-discussed topics in the literature (Ward, 1988, 1989; Johannisson & Huse, 2000; Gabrielsson & Huse, 2005; Voordeckers, Van Gils & Van den Heuve, 2007), yet academic research is still far from proving their positive impact on the firm's performance (Bettinelli, 2011; Nordqvist, Sharma, & Chirico, 2014). Outsiders can promote a better awareness of managerial issues, they can provide alternative information, experience, perspectives, and they can develop a greater ability to interpret changes in the environment (Schulze, Lubatkin, & Dino, 2003; Bammens, Voordeckers &Van Gils, 2011). Moreover, they can contribute to resolving internal conflicts and to achieving consensus within the BoD (Bammens et al., 2011). This helps protect stakeholders from opportunistic behaviors; it also allows them to gain legitimacy and to have access to external or network resources (Schwartz & Barnes, 1991; Johannisson & Huse, 2000). Some evidence exists as regards the positive impact of outsiders on innovation (Zahra & Pearce, 1989), on internationalization (Calabró & Mussolino, 2011; Chen, Hsu, & Chang, 2014), and on financial performance (Gubitta & Pittino, 2009; Dekker et al, 2015). At the same time, since outsiders find themselves working in an "emotional arena" (Van den Heuvel, Van Gils, & Voordeckers, 2006), they may appear to be "strangers" due to their lack of specific knowledge about the firm's history and environment which can be detrimental to performance if these non-family Board members are not aligned with the goals, the values, and the expectations of the family members.

On the contrary, the prevalence of inside members increases the risk of "partiality" and a "closed" outlook in the analysis of the firm's environment, which can potentially lead to not seizing opportunities or to not recognizing problems and threats. Objectives such as maintaining family control, financial independence, family employment, and harmony within the firm tend to overshadow growth and innovation goals.

It is widely acknowledged that the Board can play two main roles: a control role and a service role (Huse, 2007). In family firms, these roles change along with the family life-cycle (Lynall, Golden, & Hillman, 2003; Filatotchev, Toms, & Wright, 2006; Van den Heuvel et al., 2006; Pardo del Val, 2009; LeBreton-Miller & Miller, 2013), and as a consequence of succession processes (i.e., number of generational passages and number of descendants involved).

When property and management overlap and the firm's vision is shared, service roles can bring greater added-value. Given the generally low level of professionalization of family SMEs, it becomes important to be

able to rely on advice and support for strategic decision-making, as well as on valuable relational networks (Gabrielsson & Winlund, 2000; Golden & Zajac 2001; Huse 2007; Zahra & Pearce 1989; Daily, Dalton, & Cannella, 2003). Outside Board members can bring managerial skills and networking abilities to the firm, thus compensating for the shortage of competences in family members and helping the firm sustain its orientation towards innovation. The development of internal learning processes from generation to generation (Klein, Shapiro, & Young, 2005; Bonti & Cori, 2011; Cori & Bonti, 2014; Maseda, Itturalde, & Arosa, 2015; Blanco-Mazagatos, de Quevedo-Puente, & Delgado-García, 2016) may reduce the need for additional (and external) knowledge and abilities.

Control roles become significant especially after the first generational shift, when it is likely that more than one generation or more than one family branch is involved in the firm's governance and management. A clash of interests can often occur between the short-term orientation of some family members and the longer-term perspective of others (Vilaseca, 2002; Lumpkin & Brigham, 2011). In these cases (Ward, 1997; Van den Heuvel et al., 2006), the Board is expected to play a role of control and to mediate among different interests (Gabrielsson & Huse, 2005), especially when conflict intensifies and seems to preclude a consensus (Jehn, 1995).

2.2 Innovation as a Strategy in Family SMEs

Innovation is the lever by which all businesses can capture, explore, and exploit business opportunities. Empirical research has highlighted that some distinctive features of family SMEs may either foster or inhibit innovation (De Massis et al., 2015). This means that it is not possible to state, a priori, if family firms are more or less innovative than non-family businesses (Craig & Dibrell, 2006; Llach & Nordqvist, 2010; Carnes & Ireland, 2013). Among the favorable conditions for innovation, the importance of the family's values and of the inheritance to be conveyed, the prevalence of a multi-generational perspective, the lower levels of formalization, the presence of "patient" capital, as well as the alignment of ownership and management interests are often identified. (Le Breton-Miller & Miller, 2006; Kellermanns & Eddleston, 2006).

At the same time, a low propensity for and unwillingness to take risks, the overlap of family ownership and control (Schulze et al., 2003), as well as the desire to not open management to non-family members are factors that can exert a braking force on the decision to undertake innovation pathways (Chrisman et al., 2015). By leveraging mainly on internal resources, family SMEs limit their interactions with the outside environment, a source of new knowledge, information, and ideas. In that sense, the presence of only family members on the Board may not only deprive the company of the availability of new skills and experiences, but could also inhibit or prevent the exchange and renewal of competences already held by family members. Conservative and defensive behaviors, strongly anchored to an "old" way of managing the firm, tend to have the upper hand (Carney, 2005), risking to compromise the firm's longevity.

Intergenerational transitions may also influence the pace of innovation within the firm, through the redesign of governance structures (e.g. the Board's composition), as a result of different degrees of family involvement (Maseda et al., 2015; Blanco-Mazagatos et al., 2016). Different governance structures – presence of family and/or non-family members, number of generations and/or family branches, types of roles on the Board, and so on (Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007; Le Breton-Miller & Miller, 2006) - can compromise the firm's ability to have multiple and different perspectives. These, in turn, can affect some critical factors in fostering innovation: the degree of renewal of strategic objectives, the attitude towards risk-taking, and the temporal horizon of investments (Carnes & Ireland, 2013; Cucculelli, Le Breton-Miller, & Miller, 2016).

The studies that have been focused on family firms, in an effort to identify those factors that influence their innovative capacity (Li & Daspit, 2016, Gómez-Mejía et al., 2007), have proposed the idea of the existence of a best innovation strategy. We, instead, suggest that each family firm should be able to identify an innovative path that is consistent with the firm's features and context. The efforts that firms make to promote product/process innovation do not necessarily consist of leaps forward, or mimetic behaviors aimed at replicating existing models. Rather, firms should foresee an evolutionary path towards a new equilibrium where innovation choices, cultural traits, and the other distinctive features of the family-owned firm are mutually consistent.

3. Research Objectives, Methodology, and Data Collection

The aim of our research was to assess whether and to what extent the dynamics of the governance structures in family SMEs may affect their innovation paths. Specifically, we aimed to shed light on the relationship between the dynamics of the BoD and other governing bodies, the ways in which the company acquires or gains access to new knowledge, and the degree of innovation in product/market strategies.

Starting from mainstream literature on the governance structures in the family-owned SMEs, the results of our research may contribute to a theoretical advancement in the understanding of the relationship between choices concerning the governance structures and the innovation strategies of family-owned businesses. We believe that the findings may allow a process of analytical generalization (Eisenhardt, 1989), by providing new insights regarding the impact of governance structures on SMEs' innovation strategies.

We carried out a multiple case-study, in the logic of replication (Yin, 2009; Pauwels & Matthyssens, 2004; Eisenhardt & Graebner, 2007; De Massis & Kotlar, 2014). The analysis is exploratory in nature, since we are interested in studying how choices concerning the governance structures affect the firms' innovation processes. Moreover, it has a longitudinal feature, as we observed changes in the governance structures and in the firm's portfolio that occurred in the time period of 2010-2016.

We investigated three family-owned SMEs, located in the region of Tuscany. The desire to consider a territory that is sufficiently homogeneous as regards entrepreneurial culture and paths of industrial development led us to circumscribe our analysis to this geographical area.

The companies were selected on the basis of the following criteria: small- and medium-sized (EU range); homogeneous entrepreneurial culture; third entrepreneurial generation or beyond; ownership still held by the founder's family; same product niche as at the start of the company; availability of the current entrepreneur.

The three firms belong to the following industries: clothing-textile, gold-beating (gold leaf), and fired bricks (*cotto*, "cooked" as in fired brick, in Italian). The first one shows a low concentration ratio (5% for textile, 12% for clothing), while the other two industries highlight a notably higher ratio (Istat, 2014). As regards the extension of the respective markets, for one textile firm (Lanificio Cangioli 1859, hereafter "the Lanificio") the principle market of reference is Italy, notwithstanding increasing exports; while for the other two companies (Giusto Manetti Battiloro, hereafter "the Battiloro", and Sannini Impruneta) the foreign market absorbs a prevalent share of turnover. The firm size ranges from 20 to 250 employees, while the turnover category ranges from 4.5 to 25 million euros. For all these reasons, they offer interesting food for thought. This data is summed up in Table 1, below.

Table 1. Main features of the sample

Firm	Industry	Employees (2016)	Sales (2016, M €)	Main market	Year of establishment	Number of generations
Lanificio Cangioli 1859	clothing-textile	21-50	10-25	national (italy)	1859	5
Sannini Impruneta	fired bricks ("cotto)	21-50	2-5	foreign	1910	4
Giusto Manetti Battiloro	gold-beating	101-250	10-25	foreign	1820	6

Source: https://it.kompass.com and data collected through direct interviews

The research was carried out by using both primary and secondary data. Primary data was collected through semi-structured face-to-face interviews with one member of the firm owner's family currently involved in the entrepreneurial activity. The interviews (two for each company) were conducted between early 2009 and mid 2016; they lasted from one and half to two hours, and were tape-recorded and transcribed. Field notes were also collected.

In the first interview (2009-2010), the entrepreneurs were given free rein to narrate their family firm's history. The purpose was to obtain a very complete picture of the following items: the firm's strategic-competitive position, the evolutionary paths followed since its foundation, the knowledge/skills sustaining the competitive edge, and the most meaningful features concerning governance and organizational structure.

The second interview (2016) was mainly aimed at verifying the occurrence of any change in the governance structure in the last few years and at analyzing the more recent management choices concerning product innovation and market strategy.

Secondary data consisted of documents provided by the entrepreneurs themselves, information from the companies' websites, and press releases. Notwithstanding the fact that the relevance varied from one firm to another, these sources of information were able to meaningfully strengthen the "story" that we had been told during the interviews.

4. The Cases in Short

As mentioned above, the three cases were selected based on some common features, such as size, company culture, ownership, having passed into the hands of the third (or greater) entrepreneurial generation, and a careful balance between tradition and innovation. Nevertheless, the three firms also display some specificities related to their belonging to different industries and to their innovating at quite different paces; they also varied in type of product and market strategies. In the process of investigation, we used a replication logic. We began by analyzing the relationship between governance and innovation strategies within the firm that seemed to be characterized by a slower innovation pace; then, we continued with the firm that showed a notable but not very fast pace, and lastly, we investigated the firm in which we could detect a faster innovation pace. Below, we succinctly describe the peculiarities of each of the three firms, in terms of evolutionary path, products, and markets, based on their competitive edge and recent meaningful strategic changes.

Lanificio Cangioli 1859

The founder Vincenzo Cangioli started his entrepreneurial activity in 1859 with a pharmacy and a textile workshop. He worked as an upholsterer and was also a buyer, designer, and the market manager of this woolen fabric product. From the second generation on, the business began the production of wool fabrics. In the 1990s they steered the company towards a high degree of innovation, high flexibility, and high-quality standards, through the strengthening the vertical industrial structure. Thanks to these changes, the Lanificio has brilliantly overcome the period of crisis that deeply affected the textile district of Prato, in northern Tuscany where the company is headquartered. Two brothers, representing the fifth generation of owners, are presently at the helm of this company; they share equally in the governance and management of the company.

The firm's distinctive competences are identified first and foremost in the technical knowledge of its owners and employees and in the creativity of the product. Along with some standardized lines, the company also offers customized lines, developing special designs and colors in cooperation with the client. The pursuit of creativity characterizes the design of the collections, both for men and women; these can achieve a modern look with classic fabrics, as well as a classic look with fabrics having an innovative composition of fibers.

Sannini Impruneta

This company was set up in 1910, following a transformation of the original artisanal trade into an industrial one. Its founder was previously a silk merchant. Today, Sannini Impruneta, located just a few kilometers from Florence, is one of the most well-known and long-lived companies in the industrial production of terracotta paving tiles and façades (curtain walls). The production consists of a wide range of floor and wall tile products for the building industry. The search for innovative designs showcases the artistic and architectural values of terracotta in a modern and original way.

The classic lines of the hand-made *cotto* were integrated over time with the production of pavings and façades, both made through automated processes. The continuous study of new materials is combined with a particular attention to the sustainability of the production process. In addition to its standard products, the company is able to develop custom solutions for projects that are jointly developed with architects and designers. In the last few years, a further innovation, Terraoro, came about as the result of a joint project with the Battiloro.

The product not only continues the Renaissance tradition in the renown Florentine style, but continues to maintain the high quality of its raw materials and workmanship. This, together with the managerial capacity built around its productive skills, all constitute the basic criteria for the firm's competitive edge. The company, now in its fourth entrepreneurial generation, is managed by one of the three descendants of the founder; the BoD has a very simple configuration, including two members of the same branch of the owner family.

Giusto Manetti Battiloro

The origins of the company go back to 1820, when the founder first transformed the craftsman's gilding workshop, which was already active in Florence for two generations, into a "gold-beating" trade. Following repeated operations of acquisition and smelting, mainly during the fourth generation of owners, the Battiloro became one of the few companies in the sector able to operate on the global market. Currently, the company has its headquarters and main production plant in Florence; two subsidiaries are located in Spain and Poland. It is presently managed by two branches of the entrepreneurial family; both parts equally sharing the governing and managerial roles.

The quasi-artisanal character of its production process, combined with managerial competence which evolved in the commercial and administrative areas, constitutes the source of the company's competitive advantage still today.

Alongside its traditional productions, gold leaf and gilding products for artistic decoration and restoration, the company has recently strengthened its presence in other markets, such as interior design, furniture and furnishings accessories. Moreover, new product lines have been introduced: *Terraoro*, *Gold Chef* (edible gold), and *Beauty Gold* (gold for cosmetics).

5. Findings

5.1 Innovation Strategies

In the 2010-2016 time period, the three firms showed a notable ability to face environmental challenges and to overcome the world economic crisis. Changes observed in product and market strategies have never contradicted the consolidated orientation of the firm, that is, the search for a careful balance between tradition and innovation. However, the push towards innovation in the three firms has been dissimilar, as was supposed after the analysis of the available documents.

For the purposes of this study, we considered product innovations as a major change in the firm's portfolio. In accordance with Matzler et al. (2015), we took the number of new products as an indicator of the innovation pace. Moreover, we took into account the entrance into new markets and market niches that considerably modified the firm's competitive arena.

Our inquiry revealed that the Lanificio has been characterized by a moderate innovation pace, primarily concerning production lines. Changes that occurred during the period of observation show an emergent differentiation strategy, aimed at enforcing the presence of the firm in the high-end market segment, continuing the path started in the 90s. Such a differentiation strategy did not give rise to any specific need for new competences, but rather, a recombination of those already held by the firm.

> *"With the help of a consultant and also thanks to the product skills developed in the meantime, Sabina and I decided to work on lighter fabrics (combed wool yarn), to wear in all seasons. But the consultant was not a creative designer, so we decided (...) to look for a young man who could fit the company's needs" (Vincenzo Cangioli, 4-7-2016)*

On the contrary, the Battiloro has maintained a fast innovation pace, concerning both the brand renewal and the penetration into new markets. Gold leaf has gradually been used in new kinds of products and for different consumer targets, exploring new businesses opportunities, even far from the traditional domain of the firm.

The innovations carried out during the observation period seem to sometimes indicate differentiation, looking at the manufacturing technologies and the enlargement of the originally developed market, and sometimes diversification, considering the entrance into emergent markets, such as cosmetics and the food industry, in a logic of exploration. A case in itself is represented by the launch of *Terraoro*.

> *"The idea of putting together brick and gold leaf (for the decoration of luxury residences) is highly innovative and, at the same time, it combines two Tuscan artisan traditions. It also represents a strong discontinuity in terms of manufacturing process, being a completely hand-made product" (Niccolò Manetti, 12-4-2016)*

Differentiation and diversification strategies required new competences, both technical and managerial. Indeed, the transition from semi-finished to finished products (for cosmetics and edible products) necessitated developing flexible know-how be able to produce gold leaf of different hardness, depending on the industry in which it is to be used. Moreover, the launch of *Terraoro* required a marked change in the management approach as well as in the firm's culture.

Lastly, the innovation pace at Sannini Impruneta can be classified at an intermediate level if compared to the other two firms. It has primarily consisted in the integration of "vertical" products (façades) with the traditional "horizontal" floor coverings (pavings), the main business since the foundation of the firm.

> *"Some of the most renowned architects have highlighted a new use of terracotta in the façade cladding of buildings, allowing further re-launching of a material that is highly versatile and rich in historical meanings" (Carlo Poccianti, 27-6-2016)*

The idea of employing *cotto* for the façade of a building has quasi-automatically determined a wider variety of markets served; in particular, it opened good opportunities in the field of international government projects concerning building and infrastructures. Such changes in the firm's policy, while being traced back to a differentiation strategy, required the development of new competence, related to installation more than to the change and the upgrading of manufacturing techniques. Indeed, the mounting of façades requires much greater technical skills than laying tiles on a floor; this is due either to the vertical position itself or to the fact that in

some buildings the *cotto* blocks rotate. Table 2, below, provides an overview of the main innovations - concerning products and markets - undertaken by the firms during the period of analysis.

Table 2. Type and degree of innovation (2010-2016)

Innovation strategies	Lanificio Cangioli 1859	Sannini Impruneta	Giusto Manetti Battiloro
new products	*Fabbrica* (men's collection) *Ad hoc* (high-end women's collection)	*Terraoro*	*Terraoro* *Chef gold* *Beauty Gold*
new market niches		government projects (railway stations, theaters, roadway sound barriers…)	furniture and furnishing accessories
competences developed (related to product launching or market entry)	no	technical (product differentiation, façades installation)	technical (hand-made products) & managerial
degree of innovation in product/market strategies	low	medium	high

Source: data collected through direct interviews

5.2 Governance Structures

Looking at the evolution of governance structures required going back some years before our interviews with the entrepreneurs. We investigated both the composition and the dynamics of the BoDs, as regards the presence of one or more family branches and of outside directors.

In all of the companies, we found only internal directors on their Board, which is what Schwartz and Barnes (1991) call an "all-family Board". Instead, the dynamics observed in connection with the last generational transition varied slightly across the firms, as summarized in Table 3 and described below.

Table 3. Type and dynamics of governing bodies

Firm	Industry	Employees	Sales
composition of the Board: number of family members number of non-family members number of family branches	2 only family members 0 1	2 only family members 0 1	6 only family members 0 2
change in number/type of members (2010-2016)	no	no	no
last change in the composition of the Board	2003 (exit of the other family branch)	1999 (exit of the previous generation and of the other family branch)	2009 (exit of the previous generation)
other governing bodies	no	no formal body; frequent informal meetings with all family shareholders	no

Source: data collected through direct interviews

The Lanificio simplified its governance structure because one of the two family branches decided to leave the family business. It left both control and management roles, after a period of difficult co-management by the two family branches at the helm of the company. The BoD is the only governing body and its configuration is considered suitable to the current state of the business; no need for higher formalization is perceived. Possible changes will occur only in perspective, given that the entrepreneurial family is currently evaluating to the possibility of enlarging the proprietary base as it is not clear whether the forthcoming generation will be interested in carrying on the family business. However, no change in the governance structure is hypothesized in relation to innovation strategy or to the need to strengthen competences held by the company.

> *"Our governance structure is characterized by clear roles, results show that this way is right (...); we decided to share tasks among us informally, no formal proxies have been decided. However, we need to start thinking of an exit strategy (as regards both management and control); if we find the way to enlarge the*

proprietary base (the issue of a higher degree of formalization) should be faced" (Vincenzo Cangioli, 4-7-2016)

The dynamics of governance shown by the Battiloro during the last generational change have been quite different, notwithstanding the fact that family structures here and in the Lanificio are similar. In the gold-beating company the transition from the fifth to the sixth entrepreneurial generation took place in two steps, within a decade. In the 80s the members of one family branch sat on the Board and assumed control and management responsibilities; they were followed by the members of the other family branch at the beginning of the 90s. Thus, the composition of the BoD showed a notable enlargement, due to the inclusion of all the members of the sixth generation. This, jointly with intra-generational differences concerning the entrepreneurial orientation, gave rise to some conflicts and resulted in an uneasy cohabitation between the two branches.

This situation notwithstanding, no significant change has been implemented up to now, perhaps to avoid taking any step that could throw off a precarious state of equilibrium. The only change that was made concerns last member of the previous generation leaving the Board, but this is not considered very meaningful to the decisions taken later in the company. However, the entrepreneur we interviewed explicitly stated his wish to shape the Board differently.

"If the whole company were mine, I would have already integrated (the current configuration of the Board) with a lawyer and a tax consultant, leaving only two members for each family branch." (Niccolò Manetti, 12-4-2016)

Finally, the Sannini Impruneta company shows a fairly simple and stable composition of the BoD which includes only two members from the same family branch. There had been a third member who retired during the 90s and was never replaced. To balance this very simple configuration, informal meetings with all the family shareholders take place regularly; this does not, however, lead to the formation of new governing bodies. The stability of the governance structure is considered a strength that can help in overcoming the current phase of uncertainty. Changes in the Board can be envisaged only in case the company would decide to integrate with an industrial partner; this would allow the firm to internalize competences related to the installation of façades.

"We do not necessarily consider as inappropriate that the Board has not changed its composition for a long time. Rather, we intentionally decided to stay (in the BoD) to walk together to this juncture" (Carlo Poccianti, 27-6-2016)

5.3 In Search of New Competences

Evidence from the three firms shows that innovation strategies are not supported by changes in the governance structures. No change in the Board's composition occurred contextually or in advance with respect to the decisions concerning product innovation or market expansion. Neither was there a phase of innovation generation fostered by a change in the governance structure, nor was there a phase of implementation supported by new competences brought in by new Board members. If this situation seems reasonable in the case of the Lanificio, where innovation can be regarded as "incremental" and does not require developing new knowledge and skills, it calls for an alternative explanation when reflecting on the innovation processes carried out by the Battiloro and Sannini Impruneta. In the first case, the innovation strategy demanded only new technical competences, while in the second case, in order to implement the innovation process, both technical and managerial skills required upgrading. Therefore, we asked the entrepreneurs how their firms have succeeded in acquiring, or accessing competences perceived as necessary following the implementation of innovation strategies.

In the case of Sannini Impruneta, the competences needed for entering the business of curtain walls were developed in two different ways. On the one hand, an interpersonal network was developed by the current entrepreneur, in order to imagine new ways of employing *cotto* as a vertical covering.

"Tailor-made production is our strength: we work with famous architects and each of them proposes something different ... because they are great innovators. the idea of using terracotta in the façades was by Renzo Piano" (Carlo Poccianti, 27-6-2016)

The projects carried out in collaboration with them showcased a new use of terracotta on the façade of important buildings, thus giving rise to a strategy of re-launching this material. On the other hand, an external manager coming from the marble-cutting industry was hired, in order to build technical skills and to find technical solutions for the installation of façades. He is currently involved in fostering the development of technical skills associated with the new business.

"Non-family managers have been hired with the intent of integrating too specific knowledge and skills" (Carlo Poccianti, 27-6-2016)

In the case of the Battiloro the logic of access to competences that support the new brands seems to prevail. One of the managing directors is involved full-time in developing relationships with other companies, entrepreneurial associations, financial institutions, and trade unions.

"I decided to invest in ideas, skills, creativity ... I am member of more than a dozen Boards of industrial and financial companies... I take care of relationships" (Niccolò Manetti, 12-4-2016)

This networking strategy favored a proactive orientation and provided fertile ground for continuously developing and sharing new ideas to create further business opportunities. However, if knowledge related to potential new brands and markets has been developed mainly thanks to a fruitful exchange with the outside, the upgrade of managerial skills has also benefited from the entrance of the younger branch of the family in the roles of governance and management. In this sense, then, the origin of the recent innovative strategies can somehow be traced back to the completion of the last generational transition. Finally, the technical competences linked to the new brands were developed internally.

In the same way, the Lanificio maintained, throughout the period of observation, its capability to acquire/access new competences, although they were not immediately employable in the new productions. In this case the ability to gather new knowledge through the interpersonal network of the current entrepreneurs appears to be balanced by the internal growth of technical capabilities, primarily based on a learning-by-doing approach. The ability to choose people with the right competences (mix of technical skills and creativity), together with the willingness to listen and learn from them, is the key to reading the company's recent development, perhaps more than any other action taken by the owners. In particular, the recruitment of a new technical designer, a key role in designing collections, has proved to be essential for the development of not only technical know-how, but also of a "winning team", thanks to a dense network of relationships with people working in the textile industry.

6. Discussion and Conclusion

The joint analysis of the three cases highlights some similarities but also some differences as regards their governance structure and the way they satisfy the need for new competences. The comparison between the cases does not lead to clear-cut and univocal results. However, this work is able to shed new light on the relationship between the composition and dynamics of the governing bodies on the one hand, and the innovation paths undertaken by firms on the other. Moreover, it suggests revisiting the assumptions of the theory about the role of the BoD in fostering or inhibiting innovation in family-owned SMEs. In particular, our findings question the assumption that the presence/absence of external members on the Board can foster/hinder innovation.

In the period of observation, the analyzed firms did not show any change either in number or in type (inside vs. outside) of members belonging to their respective Boards, whereas the last significant changes in the composition of the BoD are sufficiently distant in time to be considered at the origin of the recent decisions concerning innovation. No external member is present initially on the Boards of the three companies and no one is included during the period. Furthermore, no other formal governing body (e.g. family councils) was set up in the same time period. This can be partially explained by the fact that in all three of the companies the last generational change occurred in the 90s and it probably exhausted its effect on the Board's composition before the turn of the new millennium.

Indeed, changes in type and composition of governing bodies do not necessarily result from a generational shift. They may also come from the entrepreneurial or managerial willingness to align the firm's strategy, governance, and organization. Moreover, they may result from the acknowledgement that a greater openness of the Board to external members allows the firm to gather knowledge and skills that it is not able to develop inside, on its own.

The firms show different approaches regarding both the composition of the BoD and the responses to the widening of the ownership base. Furthermore, all of the choices concerning the governance structure seem to diverge from prescriptions and suggestions expressed by the mainstream theory (Schwartz & Barnes, 1991; Schulze et al., 2003). Although literature emphasizes the role of non-family members in seizing environmental opportunities, developing a better awareness of the company's challenges, and, ultimately, in fostering innovation, our analysis suggests that the different approaches to innovation are not the result of any specific choice as regards the presence of non-family members in the Board. Hence, the reluctance to open the Board to external members does not seem to preclude the implementation of innovative strategies. What is more relevant, for this purpose, seems to be the propensity to network and the resulting ability to access external competences.

Our research presents from some limitations; two, in particular, are worth noting. First of all, the limited number

of investigated cases, due to the fact that we are still at an early stage of research, prevent us from asserting that theoretical saturation has been achieved since we do not rule out that some relevant topics may still emerge from the analysis of additional cases. Secondly, our distinction between a low, medium, and high rate of innovation finds no confirmation in the literature about family businesses. It would require a better explanation to achieve a less subjective classification and be more suitable for application in future research, especially in the case of a quantitative analysis at the organizational population level.

Nevertheless, we believe that our preliminary findings may warn against the excessive focus on the role of the governance structures in favoring or inhibiting innovative processes. Moreover, such evidence suggests that both the acquisition of knowledge through targeted hiring processes, and access to external knowledge through intense networking activities can be decisive in stimulating innovation in family SMEs.

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Willingness to Learn: Cultural Intelligence Effect on Perspective Taking and Multicultural Creativity

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Abstract

Technological development has intensified interconnectivity in the global sphere creating highly diverse markets and workplaces making increasingly challenging for contemporary organizations to manage culturally diverse environments while benefiting from them. Hence, fostering employees' ability to produce both novel and useful ideas within cross-cultural environments has gained enormous importance. This research attempts to better understand the relationship between cultural intelligence (CQ), perspective taking, and multicultural creativity. Data analysis from a causal, descriptive, non-experimental network survey, containing a remote associates test, supports the proposed theoretical framework in which cultural intelligence has an influence on the relationship between perspective taking and the individuals' capability of drawing upon knowledge from distinct cultures. The results of the study show that two dimensions of cultural intelligence, motivational CQ and behavioral CQ, positively influence individuals' multicultural creativity. These findings have positive implications when facing the urgent necessity of cross-cultural collaboration.

Keywords: creativity, cultural intelligence, multicultural environment, multicultural experience, multicultural creativity, perspective taking

1. Introduction

Due to technological developments as well as pressure from globalization processes, workplaces have become more culturally diverse and interdependence has greatly contributed to diversify markets since organizations have to deal with stakeholders from diverse cultural backgrounds. Globalization has also swelled the idea of belonging to a world which is systematic and where we all share common concerns, such as climate change. This unprecedented facet of multiculturalism as well as the increased interconnectivity among individuals, make organizations more dependable on employees' creative ideas, especially those that come from multicultural environments since they can particularly better respond to the complexity of present-day markets as well as enrich the organization's knowledge base. For instance, the Global Innovation Index of 2016 revealed that innovations call for more international collaboration, not only to enhance creativity but also to expand the scope of innovation (Cornell University, INSEAD, & WIPO, 2016).

Amabile (1983) defined creativity as the development of ideas that are both novel and useful. However, this study focuses on creativity that requires drawing on knowledge from various cultures, which is known as multicultural creativity (Chua, 2013). Indeed, scholars have proven that a multiculturally diverse environment has a positive influence on creativity (Leung, Maddux, Galinsky, & Chiu, 2008; Maddux, Adam, & Galinsky, 2010). This type of creativity, as it includes generated knowledge from distinct cultures, has achieved a certain complexity degree that responds to the inherent necessities of multicultural environments as wells as to the demands of the current worldwide context.

However, it is imperative to note that intercultural work environments do not always lead to the creation of novel and useful ideas and even sometimes obstruct the creative process (Chua, 2013). This is mainly because tensions and conflicts unavoidably take place as organizations become more culturally diverse (Jehn & Mannix, 2001). For instance, scholars have demonstrated that experiencing indirect cross-cultural tensions and conflicts in a

direct social environment strengthens ideas of cultural incompatibility and stereotypes, hence it alters individuals' capacity to make use of knowledge from various cultures (Chua, 2013). Researchers have not yet found how to mitigate this negative effect of ambient cultural disharmony on creativity.

An initial approach in the literature of creativity aiming to enhance the creative process has studied three key factors: climate, trust, and knowledge sharing (Černe, Nerstad, Dysvik, & Škerlavaj, 2014; Grant & Berry, 2011). Nonetheless, all these studies have not considered the role of multicultural environments thus far. A more approximate approach in the research about diversity has studied diverse teams, where scholars have reported that work teams are enriched by their diversity (Hoever, Van Knippenberg, Van Ginkel, & Barkema, 2012).

A growing body of studies being conducted around the world suggests that the current global conditions demand to improve individuals' competence to function adequately when they face cross-national assignments, which take place in multicultural situations, ethnically-distinct environments or organizations that differ in their corporate culture. This ability is known as Cultural Intelligence (CQ) (Bhagat, 2006; Livermore, Ang, & Van Dyne, 2010). Cultural intelligence enables individuals not only to adapt to a new cultural environment but also to absorb expertise from it to design a strategy in order to perform in a competent manner. Therefore, its relevance lies on the fact that, as well as emotional intelligence (EQ) and intelligence quotient (IQ) (Daher, 2015), it is a competence which can be cultivated (Erez et al., 2013). Cultural intelligence has the power to determine the performance success or failure of an individual (Ang et al., 2007; Bücker, Furrer, Poutsma, & Buyens, 2014; Ng, Ang, & Van Dyne, 2011) in a certain environment. This plays a pivotal role to excel in today's work environment.

Cultural intelligence is comprised of four dimensions: metacognitive, cognitive, motivational, and behavioral. Metacognitive CQ refers to individuals' capability to strategize in a cross-cultural environment. That is, capabilities such as planning, monitoring, and revising mental models of divergent cultural standards are used to increase awareness of other's cultural preferences. Cognitive CQ denotes the well understanding of other's cultures norms and differences. This dimension is nurtured by knowledge gained through education or firsthand experiences. Motivational CQ is the level of interest in adjusting to multiculturality. When this dimension is displayed, individuals expend energy to learn and perform in cross-cultural situations. Finally, behavioral CQ is the ability to adapt verbal and nonverbal language to interact properly with people from diverse cultural backgrounds. Individuals with high behavioral CQ possess chameleon-like demeanors that involve using culturally fitting words and nonverbal expressions (Ang et al., 2007; Van Dyne, Ang, & Koh, 2008). Furthermore, another approach in the personality literature performed a study about the Big 5 personality traits where researchers found that all four dimensions of CQ show a positive relationship with openness to experience, which at the same time was proven to have a significant relationship with creativity when individuals possess a high extrinsic motivation (Ang & Van Dyne, 2006).

Why is CQ related to creativity? Once individuals have developed the skills to communicate with confidence in a multicultural setting, the acquired knowledge will allow them to learn from their surroundings. Moreover, the willingness to have culturally unfamiliar experiences will facilitate multinational encounters.

This paper contends that cultural intelligence can serve as a path to enrich from a multicultural environment, regardless of its conditions, and has a positive impact on the creative ability of individuals. It proposes that individuals with a superior level of cultural intelligence can not only more easily associate knowledge from different cultures, but also have a more effective communication to take other people's perspectives. The purpose of this research is to respond to the literature gap regarding CQ and its effect on creativity. Additionally, this article suggests that cultural intelligence has a positive association with perspective taking. Individuals can benefit from this as the possibilities to face conflicts related to prejudices, stereotypes, and a hermetic attitude are diminished. Cultivation of CQ can provide individuals with the confidence, strategies, and skills required to adopt openness to learn from people with dissimilar cultural backgrounds and be part of a more novel and refined environment.

1.1 Hypotheses Statement

The potential advantage of multiculturality

Cultural diversity is composed of plurality and authenticity of a set of meanings, values, and beliefs that determine thinking and behavior. Despite the importance of innovation for social and economic progress, (Vovchenko, Ivanova, Kostoglodova, Otrishko, & Dzhu, 2016) today's global context makes innovation more dependent on cross-border collaboration (Cornell University et al., 2016). Undoubtedly, the world faces many more complex challenges that demand the construction of new knowledge resulting of cultural exchange to get more enriching answers. It can be understood that cultural diversity is a major driver for development that fosters

economic growth as well as aids to refine ourselves intellectually. Consequently, diversity becomes a way to address the expected improvement in everyone's life.

The complexity of cultural diversity

Culturally diverse environments can have several benefits to individuals who are exposed to them. For instance, scholars have studied how an intercultural ambient enhances creativity (Leung et al., 2008; Maddux et al., 2010). This kind of atmosphere is highly rich in views and it presents an extraordinary opportunity for learning; however, the convergence of plurality is divergent in nature. Therefore, to achieve harmony in such environments as well as maintain its authenticity and disparity is an arduous task. For example, scholars have also discovered that creativity in that kind of environments is not always achieved (Chua, 2013).

The lack of uniformity and homogeneity when organizations are cultural diverse makes tension and conflicts inevitably present (Jehn & Mannix, 2001). Accordingly, to accomplish multicultural creativity in a cultural environment is a complex challenge that requires more than only having cultural diversity.

Cultural intelligence on creativity

This article moots that, irrespective of the characteristics of their environment, individuals can develop the four dimensions of cultural intelligence to take advantage of it since their level of CQ allows them to express sympathy and expand their perspectives instead of limiting them (Chen & Lin, 2013). As it is related to openness to experience (Ang & Van Dyne, 2006), cultural intelligence strengthens empathy among individuals, hence enables them to relate ideas from different frameworks. Individuals with elevated levels of CQ are able to learn from others as well as cooperate and integrate other people's perspectives into their own judgment.

Furthermore, this research draws upon perspective taking which is defined as cognitive process where, in order to understand others' needs, thoughts, values, and preferences, individuals tend to accept other's points of view and at the same time they are able to see the value of other's ideas (Grant & Berry, 2011). The four dimensions of CQ in a multicultural environment strengthen the cognitive process of perspectives taking, not only in the disposition or motivation that individuals possess, but also in their ability to understand their environment and communicate effectively facilitating the free exchange of ideas.

Perspective taking together with cultural intelligence allows individuals to communicate effectively with people from diverse cultural backgrounds and learn from them. Moreover, perspective taking reduces the chances of conforming to stereotypes (Galinsky & Moskowitz, 2000) and is associated with less person-oriented conflict perceptions (Sessa, 1996). Scholars have also proven that perspective taking has more possibilities to enhance creativity not only because it fosters knowledge exchange (Grant & Berry, 2011), but supports the integration of different ideas and their extensive analysis. The analysis of plural ideas may drive the combination of them (Hargadon & Bechky, 2006).

The following two hypotheses of this research propose that individuals with a higher level of cultural intelligence are more able to engage in a perspective taking cognitive process.

Hypothesis 1. Cultural intelligence is positively associated with perspective taking

Hypothesis 2. Cultural intelligence strengthens the relationship between perspective taking and multicultural creativity

Finally, this article asserts that when individuals develop the four capabilities of cultural intelligence have a greater opportunity to learn from others, and the knowledge obtained may have a positive impact on their creativity output when they are required to draw on information from various cultures. Within the scope of cross-cultural collaboration, the convergence of the disparity of ideas is based on the ability to know how to listen and learn from each other.

2. Method

2.1 Sample Selection

To participate in this study, respondents had to meet one of the following criteria (1) have previously moved to a country different from their country of origin for studying or working (2) currently live in a country different from their country of origin for studying or working (3) are currently located in their country of origin but working or studying in an immediate environment which is multiculturally diverse. In all cases, English was the language of instruction in their university or the primary language of communication at their workplace. When compared to working or studying abroad, vacations have an inferior contribution to cross-cultural learning (Bücker, Furrer, & Lin, 2015), thus individuals who had only intercultural experiences derived from international tourism were not considered in the sample selection.

2.2 Procedure

The authors distributed a survey online adopting the snowball sampling technique (Goodman, 1961). The participants were invited to forward the survey link to other people they knew that matched the established criteria. This was made to avoid distance and time constraints of the survey administration and to diversify the cultural background of the respondents by reaching people in other countries. At a completion rate of 67.05%, empirical data were collected from 116 respondents. The survey comprised a total of four components; participants were given a maximum of thirty minutes to complete it. The first section collected demographic data such as country of origin and country of current residence, and their own assessment of how culturally diverse they perceived their direct social environment. The two following parts of the survey included items from perspective taking (Davis, 1983) and cultural intelligence scales respectively, and the last part of the survey contained a multicultural Remote Associates Test (RAT) (Chua, 2013). The first three parts of the survey were administered in English and to avoid any misconception or language barrier that may affect the multicultural RAT performance, a simple translation of the trio of words into Spanish, Chinese, and French was provided in the fourth section. Translations were selected according to sample's convenience.

2.3 Measures

Multicultural environment

Since the survey was only administered to people who have previous or current experience working or studying in a country different from their country of origin, and those who, without leaving their country of origin, are situated in a multiculturally diverse environment, such as the International Students Office of a university with significant cross-cultural population, respondents were asked to assess their own direct social surroundings from 1 = "Not at all multiculturally diverse" to 5 = "Highly multiculturally diverse".

Multicultural experience

Participants were asked to indicate the total amount of years that they had spent outside their country of origin at the time of completing the survey, without considering whether their experience was accumulated uninterruptedly or not.

Perspective taking

Participants were asked to answer seven questions on perspective taking that used a seven-point Likert scale (1 = "Strongly disagree", and 7 = "Strongly agree"). These questions were adapted from Davis (1983). Sample items include "When in a multicultural environment, before criticizing somebody I try to imagine how I would feel if I were in his/her place", and "I sometimes try to understand people from distinct cultural groups better by imagining how things look from their perspective". With the purpose of avoiding acquiescence bias and improving the participants' understanding of the questions, some of the items were phrased in reverse.

Cultural Intelligence (CQ)

This article adapted a twenty-item Likert-type scale (1 = "Strongly disagree", and 7 = "Strongly agree") developed by Bücker et al. (2015) to measure the four dimensions of cultural intelligence; Meta-cognitive CQ, Motivational CQ, Cognitive CQ, and behavioral CQ. To avoid acquiescence bias and improving the participants' understanding of the questions, some of the items were also phrased in reverse.

A reliability analysis for these adapted scales was carried out (Cronbach's $\alpha = 0.82$). All 27 items appeared to be worthy of retention, resulting in a decrease in the alpha value if deleted. The one exception to this was item 5, which would maintain alpha at the same value. Hence, none of the items were removed.

Multicultural creativity

Respondents of the survey were asked to complete a multicultural ~~Remote Associates Test (~~RAT~~)~~, which is a cross-cultural version of a widely used tool in psychological and organizations research to assess the ability of individuals to make connections between seemingly dissimilar concepts. The multicultural RAT consists of 12 trios of words that if mingled with a fourth word denote a cross-cultural concept. For instance, the trio of words *Forbidden*, *angels* and *Quebec* when put together with the word *city*, allude to the Forbidden City in Beijing, Los Angeles, California, and the Canadian city of Quebec. As shown in previous research, individuals who possess a high score in the multicultural RAT have the capability to make associations between multiculturally diverse concepts. This test provides confidence about its validity since it was found to be positively associated with the combination of ideas which belong to different cultural backgrounds when performing creative tasks (Chua, 2013).

3. Results

3.1 Demographic Profile of the Sample

After eliminating two surveys which participants answered randomly and had missing data respectively, the final sample analyzed consisted of 114 respondents (61.4% male; 73.7% between 25 and 34 years of age) from 32 countries of origin residing in 26 countries. The majority were employed full-time (46.5%) and 46% were living outside their country of origin at the time of completing the survey.

3.2 Statistics and Data Analysis

Table 1 exhibits the descriptive statistics and correlations for the variables in this study. All correlations were positively associated and 20 out of 28 were statistically significant. After finding an expected positive, although non-significant, relationship between individuals' cultural intelligence and their multicultural experience (expressed in years spent outside their country of origin), it was observed that perspective taking showed a considerable positive correlation ($r = .55$, $p < .01$) with cultural intelligence as a whole and with each of its four dimensions. This confirms the idea that individuals who cultivate the four dimensions of CQ are more likely to understand others' viewpoints and provides evidence to support Hypothesis 1.

Table 1. Descriptive Statistics and Correlations

Variable	Mean	s.d.	Min.	Max.	1	2	3	4	5	6	7	8
1. Perspective Taking	37.22	5.81	18	49								
2. Metacognitive CQ	20.46	3.63	9	28	0.40**							
3. Cognitive CQ	29.00	5.99	11	40	0.36**	0.40**						
4. Motivational CQ	27.94	4.92	15	35	0.41**	0.33**	0.41**					
5. Behavioral CQ	23.27	5.19	11	35	0.42**	0.35**	0.37**	0.16				
6. Cultural Intelligence	100.67	14.06	58	131	0.55**	0.68**	0.81**	0.67**	0.67**			
7. Multicultural Creativity	4.21	3.30	0	12	0.04	0.05	0.08	0.21*	0.25*	0.21*		
8. Multicultural experience in years	3.45	3.00	0	16	0.09	0.14	0.29**	0.22	0.15	0.29**	0.17	

n = 114 ** $p < .01$ * $p < .05$

To test Hypothesis 2, a regression analysis was conducted in SPSS (version 24). Table 2 showed that the overall model fit, resulting in $R^2 = 0.33$ ($p < .01$), improved when the four dimensions of cultural intelligence where added to the regression predicting multicultural creativity. It was also observed that motivational CQ ($b = 0.17$, $SE = .06$, $p < 0.5$) and behavioral CQ ($b = 0.15$, $SE = .07$, $p < 0.5$) had a particular effect on the relationship between perspective taking and multicultural creativity. Two adjusted regression curves illustrate this phenomenon (see Figures 1 and 2). To better understand this effect, an analysis of the mediating effect of those two variables was conducted using PROCESS macro (version 2.16) for SPSS. The results showed that perspective taking was a significant predictor of behavioral CQ ($b = .42$, $SE = .08$, $p < .05$) and motivational CQ ($b = .41$, $SE = .08$, $p < .05$). Moreover, both behavioral CQ ($b = .29$, $SE = .11$, $p < .05$) and motivational CQ ($b = .23$, $SE = .09$, $p < .05$) were significant predictors of multicultural creativity. Finally, perspective taking ($b = -0.17$, $SE = .10$, $p > .05$) was no longer a significant predictor of multicultural creativity after controlling for both mediators (see Figure 3).

Table 2. Multiple Regression Results

Predictors	*b*	SE	β	*t*	R^2
Model 1: CQ					0.307*
Multicultural Experience	0.23	0.03	0.55	7.05	
Model 2: Perspective Taking					0.313*
Multicultural Experience	-0.16	0.16	-0.08	-0.98	
Cultural Intelligence	0.24	0.03	0.58	7.03	
Model 3: Perspective Taking					0.313*
Multicultural Experience	-0.13	0.16	-0.07	-0.80	
Metacognitive CQ	0.29	0.14	0.18	2.01	
Cognitive CQ	0.07	0.09	0.08	0.79	
Motivational CQ	0.33	0.10	0.29	3.37	
Behavioral CQ	0.34	0.10	0.29	3.27	
Model 4: Multicultural Creativity					0.336*
Metacognitive CQ	-0.08	0.09	-0.09	-0.82	
Cognitive CQ	-0.04	0.06	-0.08	-0.70	
Motivational CQ	0.17	0.06	0.27	2.71	
Behavioral CQ	0.15	0.07	0.22	2.17	

n = 114

* $p < .05$

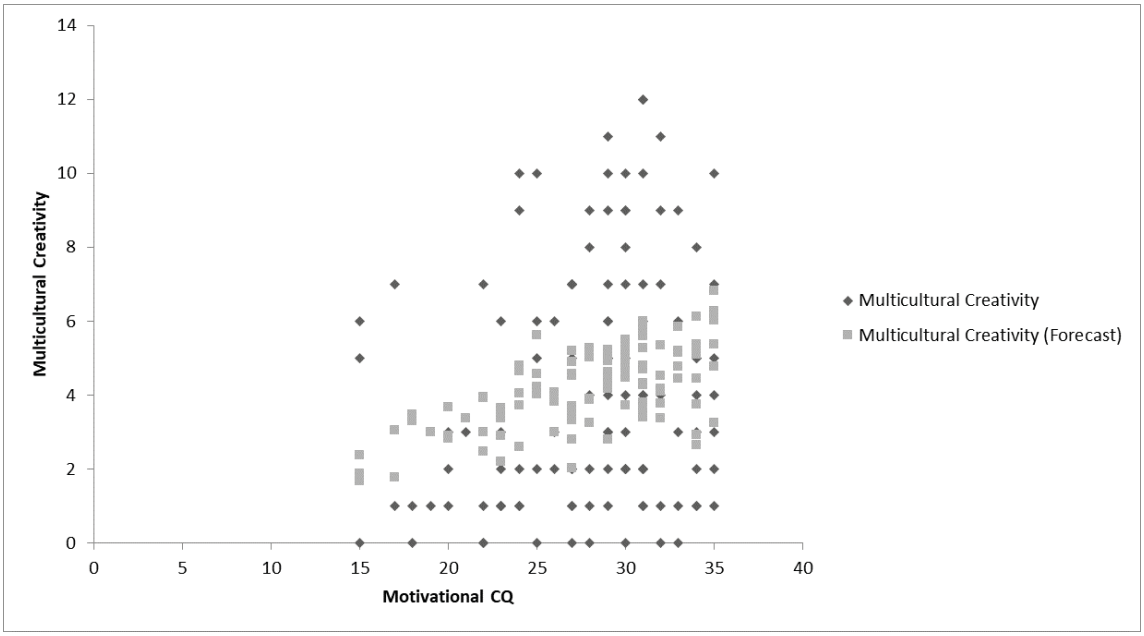

Figure 1. Adjusted Regression Curve for Motivational CQ

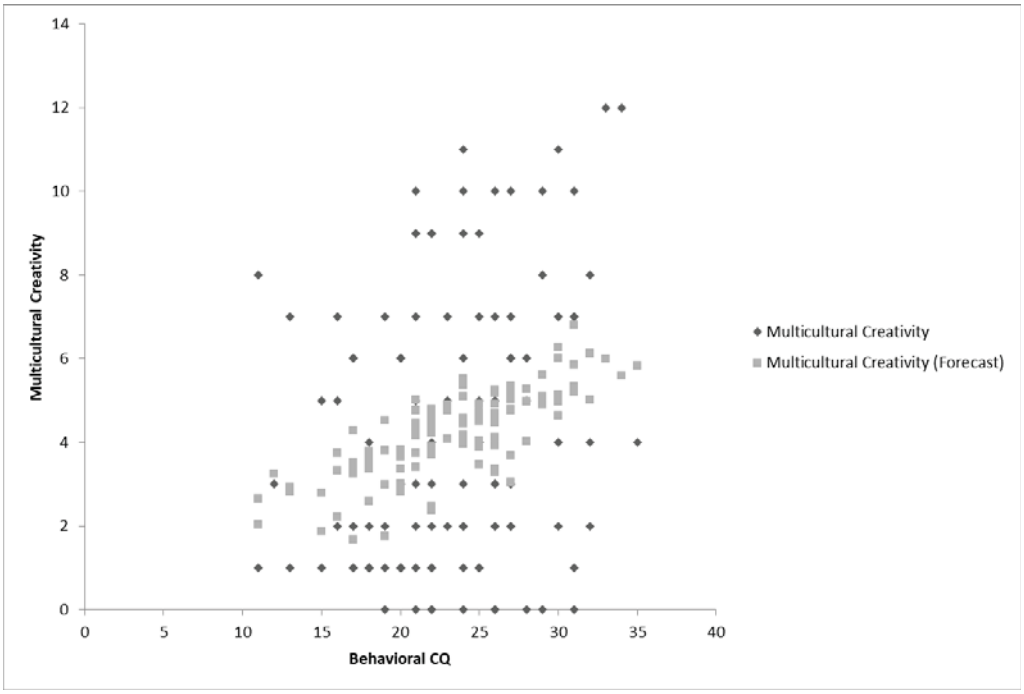

Figure 2. Adjusted Regression Curve for Behavioral CQ

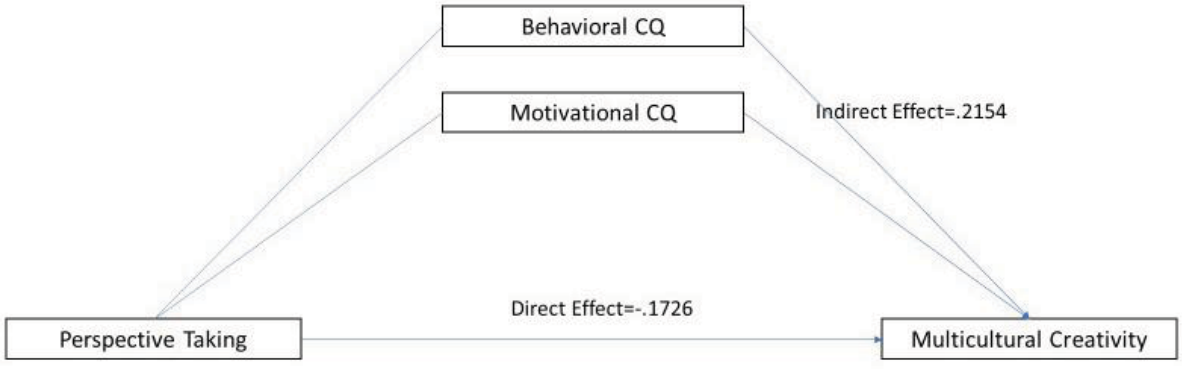

Figure 3. Behavioral CQ and Motivational CQ mediating effect on Perspective taking and Multic ultural creativity relationship

* $p < .05$ Standardized coefficients

4. Discussion

This study of the relationship between cultural intelligence (CQ), perspective taking, and multicultural creativity presents three major contributions to the creativity and cultural intelligence literatures. First, it contributes to the resolution on how to mitigate the negative effects that multiculturally diverse environments may have on individuals' creativity. Second, it supports the use of cultural intelligence as a cultivable tool that enhances the development of creativity. Third, the findings constitute a novel approach to the four dimensions of cultural intelligence and their effect on the development of novel and useful ideas in multiculturally diverse environments.

However, limitations of the study emerge from the dispersion of participants in the sample which led to the impossibility to determine the multicultural environment climate and harmony. Hence, the measurement of the perceived degree of multiculturality within the respondents' immediate social surroundings did not provide an explanation for any of the other variables approached in this article. Future research may include the examination of pertinent variables such as trust and knowledge sharing within a multicultural setting, and to study their relationship with cultural intelligence.

In summary, this study provides a major step toward cross-border collaboration in a world that is in vastly need of joint efforts to understand one another across nations and individuals.

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Questionnaire Investigation on the Needs at Fuji City and its Sensibility Analysis Utilizing Bayesian Network

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Abstract

Shopping streets at local city in Japan became old and are generally declining. In this paper, we handle the area rebirth and/or regional revitalization of shopping street. We focus on Fuji city in Japan. Four big festivals are held at Fuji city. Many people visit these festivals including residents in that area. Therefore a questionnaire investigation to the residents and visitors is conducted during these periods in order to clarify residents and visitors' needs for the shopping street, and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. These are analyzed by using Bayesian Network. Sensitivity analysis is also conducted. As there are so many items, we focus on "The image of the surrounding area at this shopping street" and pick up former half and make sensitivity analysis in this paper. The analysis utilizing Bayesian Network enabled us to visualize the causal relationship among items. Furthermore, sensitivity analysis brought us estimating and predicting the prospective visitors. These are utilized for constructing a much more effective and useful plan building. We have obtained fruitful results. To confirm the findings by utilizing the new consecutive visiting records would be the future works to be investigated.

Keywords: Fuji City, area rebirth, regional vitalization, festival, Bayesian network

1. Introduction

Shopping streets at local city in Japan are generally declining. It is because most of them were built in the so-called "High Growth Period (1954-1973)". Therefore they became old and area rebirth and/or regional revitalization are required everywhere.

There are many papers published concerning area rebirth or regional revitalization. Inoue (2017) has pointed out the importance of tourism promotion. Ingu et al. (2017) developed the project of shutter art to Wakkanai Chuo shopping street in Hokkaido, Japan. Ohkubo (2017) has made a questionnaire research at Jigenji shopping street in Kagoshima Prefecture, Japan and analyzed the current condition and future issues. For about tourism, many papers are presented from many aspects as follows.

Yoshida et al. designed and conducted a visitor survey on the spot, which used a questionnaire to investigate the activities of visitors to the Ueno district in Taito ward, Tokyo. Doi et al. analyzed the image of the Izu Peninsula as a tourist destination in their 2003 study "Questionnaire Survey on the Izu Peninsula." Kano conducted tourist behavior studies in Atami city in 2008, 2009, 2014 and in other years. Aburai et.al (2013a, 2013b, 2013c, 2014d) have made the bayesian network analysis on SNS.

In this paper, we handle the area rebirth and/or regional revitalization of shopping street. We focus on Fuji city in Japan. Fuji city is located in Shizuoka Prefecture. Mt. Fuji is very famous all around the world and we can see its beautiful scenery from Fuji city, which is at the foot of Mt. Fuji. There are two big shopping street in Fuji city. One is Yoshiwara shopping street and another one is Fuji shopping street. They became old and building area rebirth and regional revitalization plan have started. Following investigation was conducted by the joint research group (Fuji Chamber of Commerce & Industry, Fujisan Area Management Company, Katsuyama Maruyama Architects, Kougakuin University and Tokoha University). The main project activities are as follows.

A. Investigation on the assets which are not in active use

B. Questionnaire Investigation to Entrepreneur

C. Questionnaire Investigation to the residents and visitors

After that, area rebirth and regional revitalization plan were built.

In this paper, we handle above stated C.

Four big festivals are held at Fuji city. Two big festivals are held at Yoshiwara district(Yoshiwara shopping street) and two big festivals at Fuji district(Fuji shopping street).

At Yoshiwara district, Yoshiwara Gion Festival is carried out during June and Yoshiwara Shukuba (post-town) Festival is held during October. On the other hand, Kinoene Summer Festival is conducted during August and Kinoene Autumn Festival is performed during October at Fuji district. Many people visit these festivals including residents in that area.

Therefore questionnaire investigation of C is conducted during these periods.

Finally, we have obtained 982 sheets (Yoshiwara district: 448, Fuji district: 534).

Basic statistical analysis and Bayesian Network analysis are executed based on that.

In this paper, a questionnaire investigation is executed in order to clarify residents and visitors' needs for the shopping street, and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. These are analyzed by using Bayesian Network. Sensitivity analysis is also conducted. As there are so many items, we focus on "The image of the surrounding area at this shopping street" and pick up former half and make sensitivity analysis in this paper. By that model, the causal relationship is sequentially chained by the characteristics of visitors, the purpose of visiting and the image of the surrounding area at this shopping street. The analysis utilizing Bayesian Network enabled us to visualize the causal relationship among items. Furthermore, sensitivity analysis brought us estimating and predicting the prospective visitors.

Some interesting and instructive results are obtained.

The rest of the paper is organized as follows. Outline of questionnaire investigation is stated in section 2. In section 3, Bayesian Network analysis is executed which is followed by the sensitivity analysis in section 4. Remarks is stated in section 5.

2. Outline and the Basic Statistical Results of the Questionnaire Research

2.1 Outline of the Questionnaire Research

A questionnaire investigation to the residents and visitors is conducted during these periods in order to clarify residents and visitors' needs for the shopping street, and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. The outline of questionnaire research is as follows. Questionnaire sheet is attached in Appendix 1.

(1)	Scope of investigation	:	Residents and visitors who have visited four big festivals at Fuji city in Shizuoka Prefecture, Japan
(2)	Period	:	Yoshiwara Gion Festival: June 11,12/2016 Yoshiwara Shukuba (post-town) Festival: October 9/2016 Kinoene Summer Festival: August 6,7/2016 Kinoene Autumn Festival: October 15,16/2016
(3)	Method	:	Local site, Dispatch sheet, Self-writing
(4)	Collection	:	Number of distribution 1400 Number of collection 982(collection rate 70.1%) Valid answer 982

2.2 Basic Statistical Results

Now, we show the main summary results by single variable.

2.2.1 Characteristics of Answers

1) Sex (Q7)

Male 48.9%, Female 51.1%

These are exhibited in Figure 1.

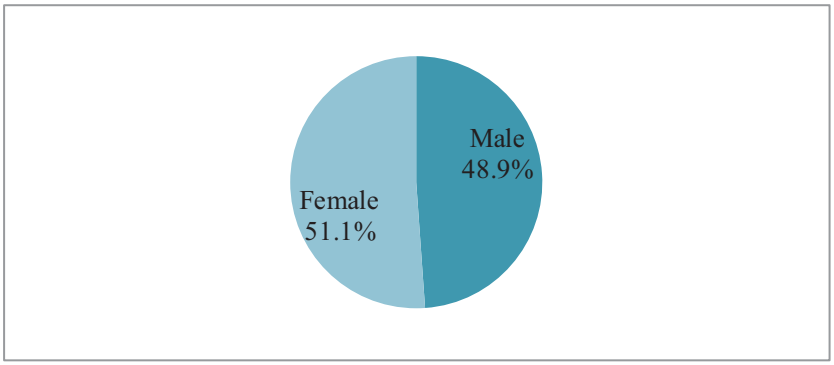

Figure 1. Sex (Q7)

2) Age (Q8)

10th 16.2%, 20th 14.8%, 30th 22.4%, 40th 17.4%, 50th 11.6%, 60th 10.5%, More than 70 7.1%

These are exhibited in Figure 2.

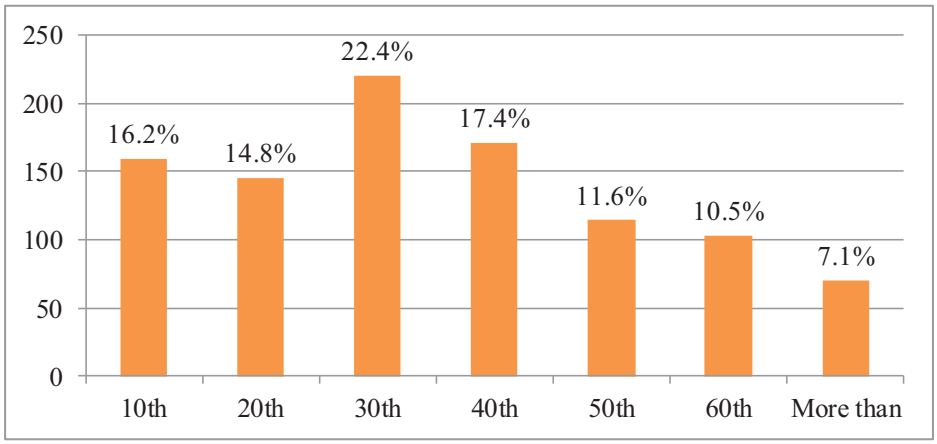

Figure 2. Age (Q8)

3) Residence (Q9)

a. Fuji city 56.4%, b. Fujinomiya city 18.0%, c. Numazu city 7.2%, d. Mishima city 2.3%, e. Shizuoka city 4.2%, F. Else (in Shizuoka Prefecture) 5.1%, g. Outside of Shizuoka Prefecture 6.9%

These are exhibited in Figure 3.

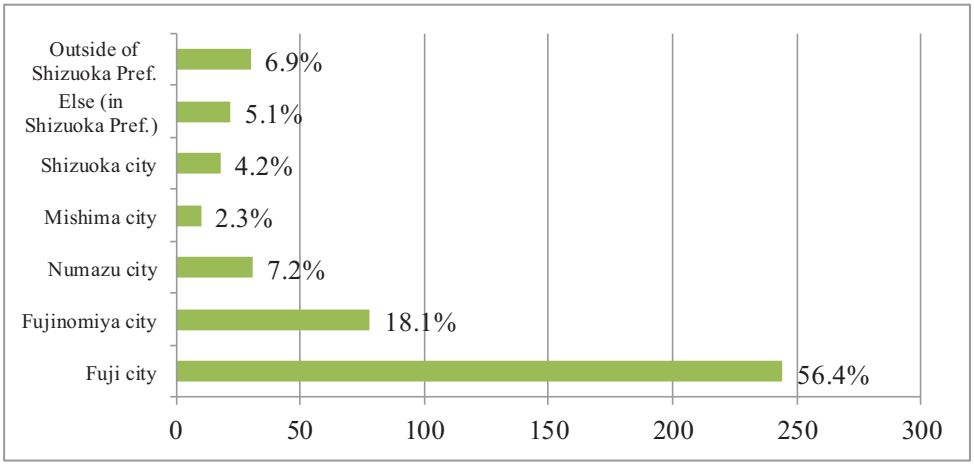

Figure 3. Residence (Q9)

4) How often do you come to this shopping street? (Q1)

Everyday 17.4%, More than 1 time a week 16.5%, More than 1 time a month 25.8%,

More than 1 time a year 31.6%, First time 4%, Not filled in 4.8%

These are exhibited in Figure 4.

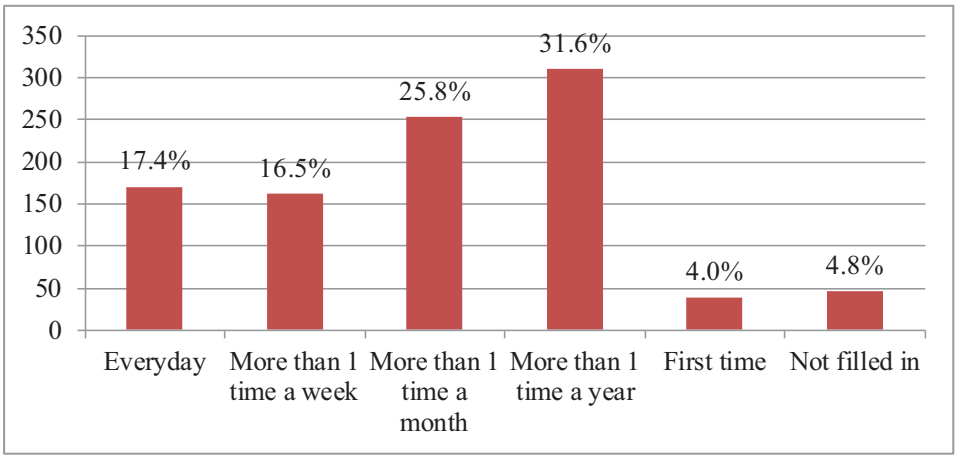

Figure 4. How often do you come to this shopping street? (Q1)

5) What is the purpose of visiting here? (Q2)

Shopping 18.8%, Eating and drinking 13.4%, Business 7.4%, Celebration, event 40.2%,

Leisure, amusement 4.0%, miscellaneous 16.1%

These are exhibited in Figure 5.

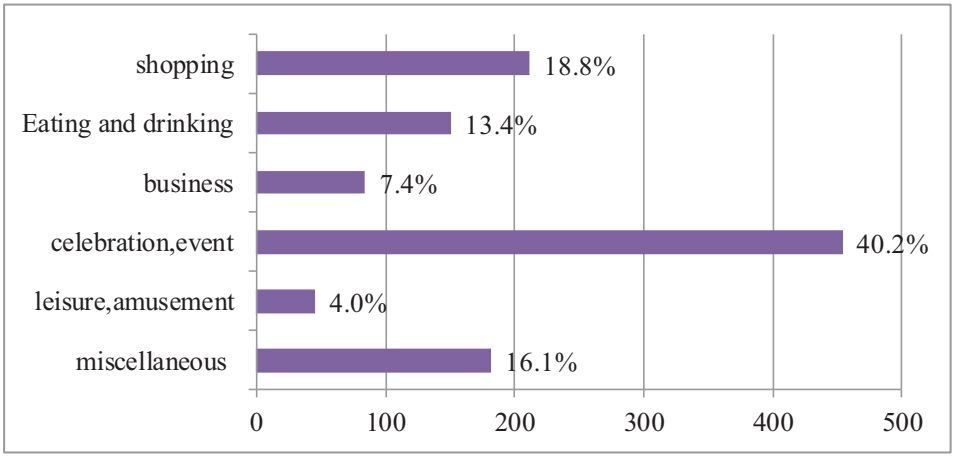

Figure 5. What is the purpose of visiting here? (Q2)

6) How do you feel about the image of the surrounding area at this shopping street? (Q3)

These are exhibited in Figure 6.

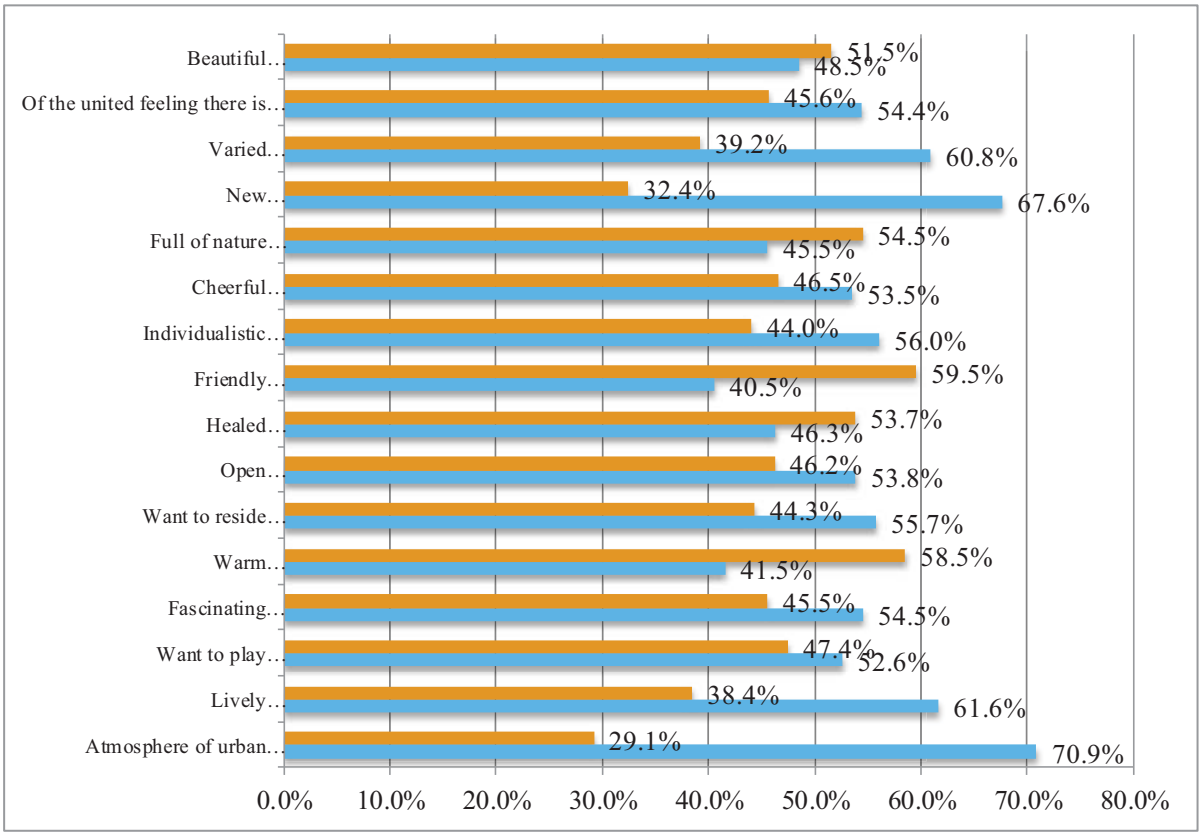

Figure 6. How do you feel about the image of the surrounding area at this shopping street? (Q3)

7) There are many old building at the age of nearly 50 years. Do you think we can still use them? (Q4)

Can use it 44.1%, Cannot use it 31.4%, Have no idea 24.5%

These are exhibited in Figure 7.

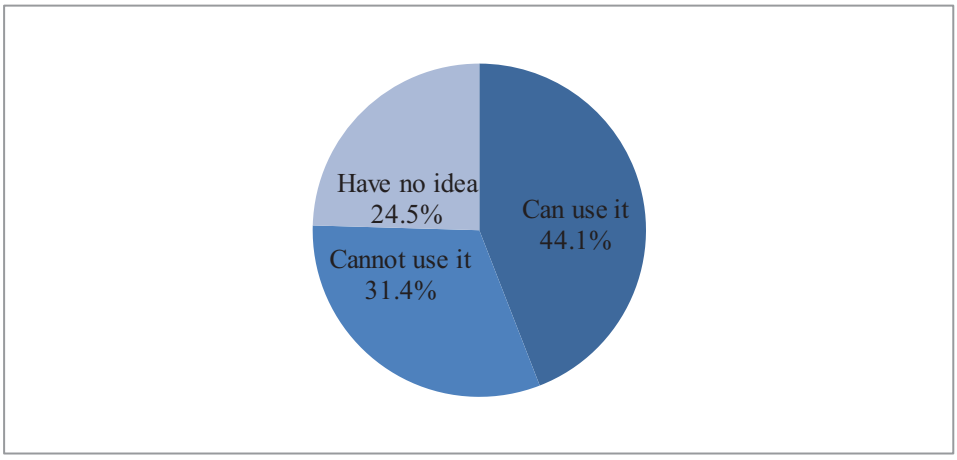

Figure 7. There are many old building at the age of nearly 50 years. Do you think we can still use them? (Q4)

3. Bayesian Network Analysis

In constructing Bayesian Network, it is required to check the causal relationship among groups of items. Based on this, a model is built as is shown in Figure 8.

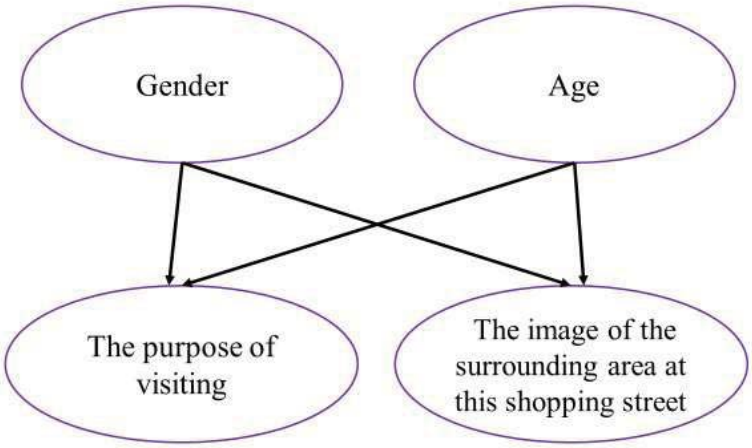

Figure 8. A Built Model

We used BAYONET software (http://www.msi.co.jp/BAYONET/). When plural nodes exist in the same group, it occurs that causal relationship is hard to set a priori. In that case, BAYONET system set the sequence automatically utilizing AIC standard. Node and parameter of Figure 8 are exhibited in Table 1.

Table 1. Node and Parameter

Node	Parameter									
	1	2	3	4	5	6	7	8	9	10
Gender	Male	Female								
Age	10th	20th	30th	40th	50th	60th	More than 70			
The purpose of visiting	Shopping	Eating and drinking	Business	Celebration、event	Leisure, amusement	miscellaneous				
The image of the surrounding area at this shopping street	Beautiful	Ugly	Of the united feeling there is	Scattered	Varied	Featureless	New	Historic	Full of nature	Urban

Node	Parameter									
	11	12	13	14	15	16	17	18	19	20
The image of the surrounding area at this shopping street	Cheerful	Gloomy	Individualistic	Conventional	Friendly	Unfriendly	Healed	Stimulated	Open	Exclusive

Node	Parameter									
	21	22	23	24	25	26	27	28	29	30
The image of the surrounding area at this shopping street	Want to reside	Do not want to reside	Warm	Aloof	Fascinating	Not fascinating	Want to play	Want to examine deliberately	Lively	Calm

Node	Parameter	
	31	32
The image of the surrounding area at this shopping street	Atmosphere of urban	Atmosphere of rural area

4. Sensitivity Analysis

Now, posterior probability is calculated by setting evidence as, for example, 1.0. Comparing Prior probability and Posterior probability, we can seek the change and confirm the preference or image of the surrounding area at this shopping street. We set evidence to all parameters. Therefore the analysis volume becomes too large. In this paper, we focus on "The image of the surrounding area at this shopping street" and pick up former half and make sensitivity analysis. We prepare another paper for the rest of them.

As stated above, we set evidence for each parameter, and the calculated posterior probability is exhibited in Appendix 2. The value of "Posterior probability – Prior probability" (we call this "Difference of probability"

hereafter) is exhibited in Appendix 3. The sensitivity analysis is executed by mainly using this table.

Here, we classify each item by the strength of the difference of probability.

・Strong (++,－－): Select major parameter of which absolute value of difference of probability is more than 0.05

・Medium (+,－): Select major parameter of which absolute value of difference of probability is more than 0.01

・Weak: Else

In selecting items, negative value does not necessarily have distinct meaning, therefore we mainly pick up positive value in the case meaning is not clear.

Now we examine each for Strong and Medium case.

4.1 Sensitively Analysis for "The Image Of the Surrounding Area at this Shopping Street"

1) Setting evidence to "Beautiful"

After setting evidence to "Beautiful", the result is exhibited in Table 2.

Table 2. Setting evidence to "Beautiful" case

Eating and drinking	－
Scattered	－
Fascinating	＋
Want to play	＋
Lively	＋
Male	－
Female	＋
Age: 10th	＋＋
Age: 20th	＋＋
Age: 30th	＋
Age: 40th	－－
Age: 50th	－－
Age: 60th	－－
Age: More than 70	＋

We can observe that "Those who have an image of the surrounding area at this shopping street as "Beautiful" had come under the image of the surrounding area at this shopping street as "Fascinating", "Want to play" or "Lively" of an age of "10^{th}","20^{th}", "30th" or "More than 70" in which the gender is "Female". (Strong part is indicated by bold font.)

2) Setting evidence to "Ugly"

After setting evidence to "Ugly", the result is exhibited in Table 3.

Table 3. Setting evidence to "Ugly" case

Want to play	－
Age: 10th	－
Age: 20th	－
Age: 30th	－
Age: 40th	＋
Age: 50th	＋＋
Age: More than 70	＋

We can observe that "Those who have an image of the surrounding area at this shopping street as "Ugly" had come by an age of "40th ", "50th" or "More than 70".

3) Setting evidence to "Of the united feeling there is"

After setting evidence to "Of the united feeling there is", the result is exhibited in Table 4.

Table 4. Setting evidence to "Of the united feeling there is" case

Eating and drinking	−
Cheerful	+
Individualistic	+
Friendly	+
Unfriendly	−
Healed	+
Stimulated	−
Open	+
Fascinating	+
Want to play	+
Lively	+
Atmosphere of urban	+
Age: 10th	++
Age: 20th	+
Age: 30th	−−
Age: 40th	+
Age: 50th	−−
Age: 60th	−−
Age: More than 70	−−

We can observe that "Those who have an image of the surrounding area at this shopping street as "Of the united feeling there is" had come under the image of the surrounding area at this shopping street as "Cheerful", "Individualistic", "Friendly", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th","20th" or "40th".

4) Setting evidence to "Scattered"

After setting evidence to "Scattered", the result is exhibited in Table 5.

Table 5. Setting evidence to "Scattered" case

Shopping	+
Eating and drinking	+
Varied	−
Cheerful	−
Individualistic	−
Friendly	−
Unfriendly	+
Healed	−
Stimulated	+
Open	−
Aloof	+
Fascinating	−
Want to play	−
Lively	−
Atmosphere of urban	−
Age: 10th	−−
Age: 20th	−−
Age: 30th	−
Age: 40th	++
Age: 50th	++
Age: 60th	++
Age: More than 70	++

We can observe that "Those who have an image of the surrounding area at this shopping street as "Scattered" had come with the purpose of visiting for "Shopping" or "Eating and drinking" under the image of the surrounding area at this shopping street as "Unfriendly", "Stimulated" or "Aloof" of an age of "40th","50th", "60th" or "More than 70".

5) Setting evidence to "Varied"

After setting evidence to "Varied", the result is exhibited in Table 6.

Table 6. Setting evidence to "Varied" case

Age: 10th	++
Age: 20th	+
Age: 40th	−−
Age: 50th	+
Age: 60th	−−
Age: More than 70	+

We can observe that "Those who have an image of the surrounding area at this shopping street as "Varied" had come by an age of "10th","20th", "50th" or "More than 70".

6) Setting Evidence to "Featureless"

After setting evidence to "Featureless", the result is exhibited in Table 7.

Table 7. Setting evidence to "Featureless" case

Individualistic	−
Fascinating	−
Want to play	−
Lively	−
Age: 10th	−−
Age: 20th	−−
Age: 30th	+
Age: 40th	+
Age: 50th	−−
Age: 60th	++
Age: More than 70	++

We can observe that "Those who have an image of the surrounding area at this shopping street as "Featureless" had come by an age of "30th","40th", "**60th**" or "**More than 70**".

7) Setting Evidence to "New"

After setting evidence to "New", the result is exhibited in Table 8.

Table 8. Setting evidence to "New" case

Male	−
Female	+
Age: 10th	−
Age: 20th	++
Age: 30th	−
Age: 60th	+

We can observe that "Those who have an image of the surrounding area at this shopping street as "New" had come by an age of "**20th**" or "60th" in which the gender is "Female".

8) Setting evidence to "Historic"

After setting evidence to "Historic", the result is exhibited in Table 9.

Table 9. Setting evidence to "Historic" case

Age: 20th	−
Age: 30th	+
Age: 50th	−−
Age: More than 70	+

We can observe that "Those who have an image of the surrounding area at this shopping street as "Historic" had come by an age of "30th" or "More than 70".

9) Setting evidence to "Full of nature"

After setting evidence to "Full of nature", the result is exhibited in Table 10.

Table 10. Setting evidence to "Full of nature" case

Eating and drinking	−
Fascinating	+
Male	−
Female	+
Age: 10th	++
Age: 20th	+
Age: 40th	−−
Age: 50th	−
Age: 60th	−
Age: More than 70	++

We can observe that "Those who have an image of the surrounding area at this shopping street as "Full of nature" had come under the image of the surrounding area at this shopping street as "Fascinating" of an age of "10th","20th" or "More than 70" in which the gender is "Female".

10) Setting evidence to "Urban"

After setting evidence to "Urban", the result is exhibited in Table 11.

Table 11. Setting evidence to "Urban" case

Age: 10th	+
Age: 20th	− −
Age: 30th	−
Age: 40th	−
Age: 60th	+
Age: More than 70	+

We can observe that "Those who have an image of the surrounding area at this shopping street as "Urban" had come by an age of "10th","60th", or "More than 70".

11) Setting evidence to "Cheerful"

After setting evidence to "Cheerful", the result is exhibited in Table 12.

Table 12. Setting evidence to "Cheerful" case

Eating and drinking	−
Of the united feeling there is	+
Scattered	−
Individualistic	+
Friendly	+
Unfriendly	−
Healed	+
Stimulated	−
Open	+
Fascinating	+
Want to play	+
Lively	+
Atmosphere of urban	+
Age: 10th	+
Age: 20th	+ +
Age: 30th	−
Age: 40th	−
Age: 50th	− −
Age: 60th	− −
Age: More than 70	−

We can observe that "Those who have an image of the surrounding area at this shopping street as "Cheerful" had come under the image of the surrounding area at this shopping street as "Of the united feeling there is", "Individualistic", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th" or "20th".

12) Setting evidence to "Gloomy"

After setting evidence to "Gloomy", the result is exhibited in Table 13.

Table 13. Setting evidence to "Gloomy" case

Eating and drinking	+
Of the united feeling there is	−
Scattered	+
Individualistic	−
Unfriendly	+
Healed	−
Stimulated	+
Fascinating	−
Want to play	−
Lively	−
Male	+
Female	−
Age: 10th	−
Age: 50th	+
Age: 60th	+ +
Age: More than 70	+ +

We can observe that "Those who have an image of the surrounding area at this shopping street as "Gloomy" had come with the purpose of visiting for "Eating and drinking" under the image of the surrounding area at this

shopping street as "Scattered", "Unfriendly" or "Stimulated" of an age of "50th", "60th" or "More than 70" in which the gender is "Male".

13) Setting evidence to "Individualistic"

After setting evidence to "Individualistic", the result is exhibited in Table 14.

Table 14. Setting evidence to "Individualistic" case

Eating and drinking	−
Of the united feeling there is	+
Scattered	−
Cheerful	+
Friendly	+
Unfriendly	−
Healed	+
Fascinating	+
Want to play	+
Lively	+
Atmosphere of urban	+
Age: 10th	+
Age: 30th	− −
Age: 40th	−
Age: 60th	− −
Age: More than 70	− −

We can observe that "Those who have an image of the surrounding area at this shopping street as "Individualistic" had come under the image of the surrounding area at this shopping street as "Of the united feeling there is", "Cheerful", "Friendly", "Healed", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th".

14) Setting evidence to "Conventional"

After setting evidence to "Conventional", the result is exhibited in Table 15.

Table 15. Setting evidence to "Conventional" case

Eating and drinking	+
Of the united feeling there is	−
Cheerful	−
Friendly	−
Unfriendly	+
Fascinating	−
Want to play	−
Lively	−
Atmosphere of urban	−
Age: 10th	− −
Age: 20th	+
Age: 30th	+
Age: 50th	+
Age: 60th	+ +
Age: More than 70	+

We can observe that "Those who have an image of the surrounding area at this shopping street as "Conventional" had come with the purpose of visiting for "Eating and drinking" under the image of the surrounding area at this shopping street as "Unfriendly" of an age of "20th","30th", "50th", "60th" or "More than 70".

15) Setting evidence to "Friendly"

After setting evidence to "Friendly", the result is exhibited in Table 16.

Table 16. Setting evidence to "Friendly" case

Shopping	−
Eating and drinking	−
Celebration、event	−
Beautiful	+
Of the united feeling there is	+
Scattered	−
Varied	+
New	−
Cheerful	+
Gloomy	−
Individualistic	+
Conventional	−
Healed	+
Stimulated	−
Open	+
Exclusive	−
Aloof	−
Fascinating	+
Not Fascinating	−
Want to play	+
Lively	+
Atmosphere of urban	+
Age: 10th	++
Age: 20th	−
Age: 40th	−−
Age: 50th	−−
Age: 60th	−−
Age: More than 70	−−

We can observe that "Those who have an image of the surrounding area at this shopping street as "Friendly" had come under the image of the surrounding area at this shopping street as "Beautiful", "Of the united feeling there is", "Varied", "Cheerful", "Individualistic", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th".

16) Setting evidence to "Unfriendly"

After setting evidence to "Unfriendly", the result is exhibited in Table 17.

Table 17. Setting evidence to "Unfriendly" case

Individualistic	−
Want to play	−
Lively	−
Age: 10th	−−
Age: 20th	+
Age: 30th	−
Age: 40th	−
Age: 50th	−−
Age: 60th	−−
Age: More than 70	−−

We can observe that "Those who have an image of the surrounding area at this shopping street as "Unfriendly" had come by an age of "20th".

5. Remarks

The Results for Bayesian Network Analysis are as follows.

In the Bayesian Network Analysis, model was built under the examination of the causal relationship among items. Sensitively Analysis was conducted after that. The main result of sensitively analysis is as follows.

We can observe that "Those who have an image of the surrounding area at this shopping street as "Beautiful" had come under the image of the surrounding area at this shopping street as "Fascinating", "Want to play" or "Lively" of an age of "10th","20th", "30th" or "More than 70" in which the gender is "Female".

We can observe that "Those who have an image of the surrounding area at this shopping street as "Of the united feeling there is" had come under the image of the surrounding area at this shopping street as "Cheerful", "Individualistic", "Friendly", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th","20th " or "40th".

We can observe that "Those who have an image of the surrounding area at this shopping street as "Scattered" had come with the purpose of visiting for "Shopping" or "Eating and drinking" under the image of the surrounding area at this shopping street as "Unfriendly", "Stimulated" or "Aloof" of an age of "40th","50th", "60th" or "More than 70".

We can observe that "Those who have an image of the surrounding area at this shopping street as "Cheerful" had come under the image of the surrounding area at this shopping street as "Of the united feeling there is", "Individualistic", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th" or "20th".

We can observe that "Those who have an image of the surrounding area at this shopping street as "Friendly" had come under the image of the surrounding area at this shopping street as "Beautiful", "Of the united feeling there is", "Varied", "Cheerful", "Individualistic", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th".

These results are very impressive to planners of tourism in Fuji city. These may be utilized to much more useful plan building for the activation of the related shopping street town.

6. Conclusion

Shopping streets at local city in Japan became old and are generally declining. In this paper, we handle the area rebirth and/or regional revitalization of shopping street. We focus on Fuji city in Japan. Four big festivals are held at Fuji city. Many people visit these festivals including residents in that area. Therefore a questionnaire investigation to the residents and visitors is conducted during these periods in order to clarify residents and visitors' needs for the shopping street, and utilize them to the plan building of the area rebirth and/or regional revitalization of shopping street. These are analyzed by using Bayesian Network. Sensitivity analysis is also conducted. As there are so many items, we focus on "The image of the surrounding area at this shopping street" and pick up former half and make sensitivity analysis in this paper. By that model, the causal relationship is sequentially chained by the characteristics of visitors, the purpose of visiting and the image of the surrounding area at this shopping street.

The Results for Bayesian Network Analysis are as follows.

In the Bayesian Network Analysis, model was built under the examination of the causal relationship among items. Sensitively Analysis was conducted after that. The main result of sensitively analysis is as follows.

We can observe that "Those who have an image of the surrounding area at this shopping street as "Of the united feeling there is" had come under the image of the surrounding area at this shopping street as "Cheerful", "Individualistic", "Friendly", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th","20th" or "40th".

We can observe that "Those who have an image of the surrounding area at this shopping street as "Cheerful" had come under the image of the surrounding area at this shopping street as "Of the united feeling there is", "Individualistic", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th" or "20th".

We can observe that "Those who have an image of the surrounding area at this shopping street as "Friendly" had come under the image of the surrounding area at this shopping street as "Beautiful", "Of the united feeling there is", "Varied", "Cheerful", "Individualistic", "Healed", "Open", "Fascinating", "Want to play", "Lively" or "Atmosphere of urban" of an age of "10th".

The analysis utilizing Bayesian Network enabled us to visualize the causal relationship among items. Furthermore, sensitivity analysis brought us estimating and predicting the prospective visitors. These are utilized for constructing a much more effective and useful plan building. There are few papers which applies Bayesian Network to the tourism theme. This may be the first trial and has significant meaning.

Although it has a limitation that it is restricted in the number of research, we could obtain the fruitful results. To confirm the findings by utilizing the new consecutive visiting records would be the future works to be investigated.

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APPENDIX 1

Questionnaire Sheet about the Image Around the Shopping Street

1. How often do you come to this shopping street?

a. Everyday b. ( ) times a week c. ( ) times a month d. ( ) times a year

e. miscellaneous ( )

2. What is the purpose of visiting here? (Plural answers allowed)

a. shopping b. eating and drinking c. business d. celebration、event e. leisure, amusement

f. miscellaneous ( )

3. How do you feel about the image of the surrounding area at this shopping street?

Select the position

Beautiful	·	·	·	·	·	Ugly
Of the united feeling there is	·	·	·	·	·	Scattered
Varied	·	·	·	·	·	Featureless
New	·	·	·	·	·	Historic
Full of nature	·	·	·	·	·	Urban
Cheerful	·	·	·	·	·	Gloomy
Individualistic	·	·	·	·	·	Conventional
Friendly	·	·	·	·	·	Unfriendly
Healed	·	·	·	·	·	Stimulated
Open	·	·	·	·	·	exclusive
Want to reside	·	·	·	·	·	Do not want to reside
Warm	·	·	·	·	·	Aloof
Fascinating	·	·	·	·	·	Not fascinating
Want to play	·	·	·	·	·	Want to examine deliberately
Lively	·	·	·	·	·	Calm
Atmosphere of urban	·	·	·	·	·	Atmosphere of rural area

4. There are many old building at the age of nearly 50 years. Do you think we can still use them?

a. Can use it b. Cannot use it C. Have no idea

5. Is there any functions or facilities that will be useful?

6. Comments

7. Sex

a. Male b. Female

8. Age

a.10th b.20th c.30th d.40th e.50th f.6th g. More than70

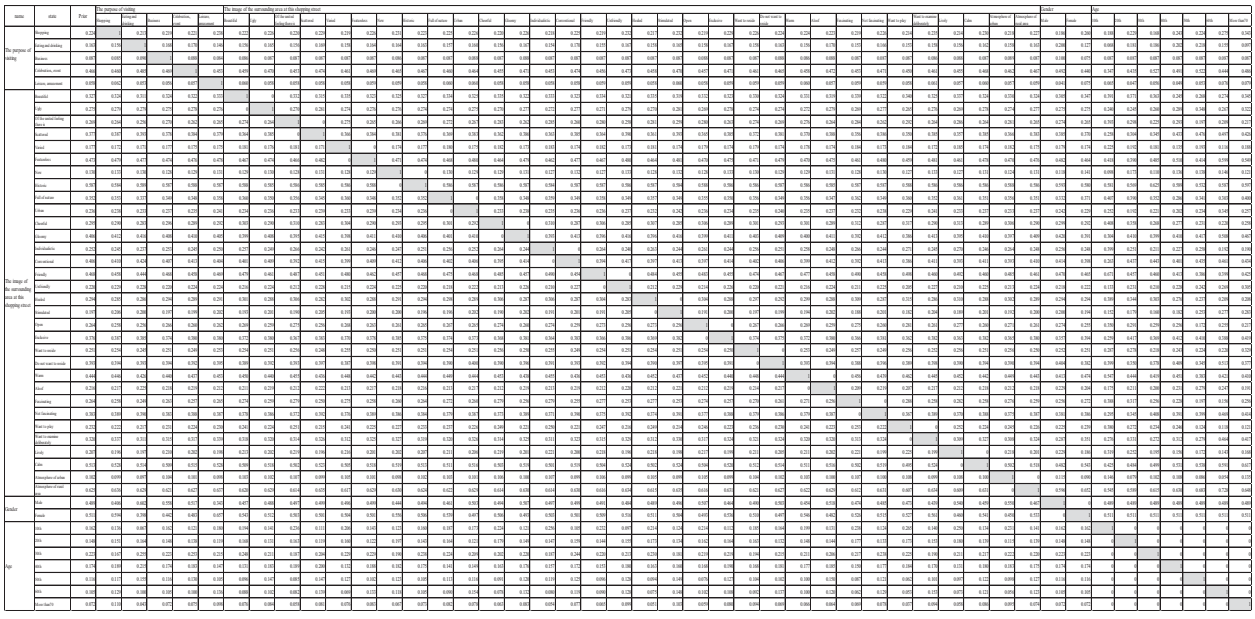
9. Residence

a. Fuji City b. Fujinomiya City c. Numazu City d. Mishima City e. Shizuoka City f. Miscellaneous in Shizuoka Prefecture

g. Outside of Shizuoka Prefecture［ ］

APPENDIX 2

Calculated posterior probability



name	state	Prior	The purpose of visiting: Shopping	Eating and drinking	Business	Celebration、event	Leisure, amusement
The purpose of visiting	Shopping	0.224	1	0.213	0.219	0.221	0.238
	Eating and drinking	0.163	0.156	1	0.168	0.170	0.146
	Business	0.087	0.085	0.090	1	0.088	0.084
	Celebration、event	0.466	0.460	0.485	0.469	1	0.453
	Leisure, amusement	0.058	0.062	0.053	0.056	0.057	1
The image of the surrounding area at this shopping street	Beautiful	0.327	0.324	0.311	0.324	0.322	0.333
	Ugly	0.275	0.279	0.279	0.275	0.278	0.276
	Of the united feeling there is	0.269	0.264	0.256	0.270	0.262	0.265
	Scattered	0.377	0.387	0.393	0.378	0.384	0.379
	Varied	0.177	0.172	0.171	0.177	0.175	0.175
	Featureless	0.473	0.479	0.477	0.474	0.476	0.478
	New	0.130	0.133	0.130	0.128	0.129	0.131
	Historic	0.587	0.584	0.589	0.587	0.588	0.587
	Full of nature	0.352	0.353	0.337	0.349	0.348	0.358
	Urban	0.236	0.238	0.233	0.237	0.235	0.241
	Cheerful	0.295	0.290	0.283	0.296	0.289	0.292
	Gloomy	0.406	0.412	0.416	0.408	0.410	0.405
	Individualistic	0.252	0.245	0.237	0.253	0.245	0.250
	Conventional	0.406	0.410	0.424	0.407	0.413	0.404
	Friendly	0.468	0.458	0.444	0.468	0.458	0.469
	Unfriendly	0.220	0.229	0.228	0.220	0.224	0.224
	Healed	0.294	0.285	0.286	0.294	0.289	0.291
	Stimulated	0.197	0.206	0.200	0.197	0.199	0.202
	Open	0.264	0.258	0.256	0.266	0.260	0.262
	Exclusive	0.376	0.387	0.385	0.374	0.380	0.380
	Want to reside	0.251	0.254	0.245	0.251	0.249	0.253
	Do not want to reside	0.393	0.394	0.393	0.394	0.392	0.395
	Warm	0.444	0.446	0.426	0.440	0.437	0.453
	Aloof	0.216	0.217	0.225	0.218	0.219	0.212
	Fascinating	0.264	0.258	0.249	0.263	0.257	0.265
	Not fascinating	0.383	0.389	0.390	0.383	0.388	0.387
	Want to play	0.232	0.222	0.217	0.231	0.224	0.230
	Want to examine deliberately	0.320	0.337	0.311	0.315	0.317	0.339
	Lively	0.207	0.196	0.197	0.210	0.202	0.198
	Calm	0.513	0.528	0.514	0.509	0.515	0.528
	Atmosphere of urban	0.102	0.099	0.097	0.104	0.101	0.098
	Atmosphere of rural area	0.625	0.636	0.629	0.621	0.627	0.637
Gender	Male	0.489	0.406	0.602	0.558	0.517	0.343
	Female	0.511	0.594	0.398	0.442	0.483	0.657
Age	10th	0.162	0.136	0.067	0.162	0.121	0.180
	20th	0.148	0.151	0.164	0.148	0.138	0.119
	30th	0.223	0.167	0.255	0.223	0.253	0.215
	40th	0.174	0.189	0.215	0.174	0.183	0.147
	50th	0.116	0.117	0.155	0.116	0.130	0.105
	60th	0.105	0.129	0.100	0.105	0.100	0.136
	More than70	0.072	0.110	0.043	0.072	0.075	0.098

The image of the surrounding area at this shopping street							
Beautiful	Ugly	Of the united feeling there is	Scattered	Varied	Featureless	New	Historic	Full of nature
0.222	0.226	0.220	0.229	0.219	0.226	0.231	0.223	0.225
0.156	0.165	0.156	0.169	0.158	0.164	0.164	0.163	0.157
0.086	0.087	0.087	0.087	0.087	0.087	0.086	0.087	0.087
0.459	0.470	0.453	0.474	0.461	0.469	0.465	0.467	0.460
0.060	0.058	0.058	0.058	0.058	0.059	0.059	0.058	0.060
1	0	0.332	0.315	0.335	0.323	0.325	0.327	0.334
0	1	0.270	0.281	0.274	0.276	0.276	0.274	0.274
0.274	0.264	1	0	0.275	0.265	0.266	0.269	0.272
0.364	0.385	0	1	0.366	0.384	0.381	0.376	0.369
0.181	0.176	0.181	0.171	1	0	0.174	0.177	0.180
0.467	0.474	0.466	0.482	0	1	0.471	0.474	0.468
0.129	0.130	0.128	0.131	0.128	0.129	1	0	0.130
0.588	0.585	0.586	0.585	0.586	0.588	0	1	0.586
0.360	0.350	0.356	0.345	0.360	0.348	0.352	0.352	1
0.234	0.236	0.233	0.239	0.233	0.239	0.234	0.236	0
0.303	0.290	0.310	0.283	0.304	0.290	0.293	0.295	0.301
0.399	0.408	0.395	0.415	0.398	0.411	0.410	0.406	0.401
0.257	0.249	0.266	0.242	0.261	0.246	0.247	0.251	0.256
0.401	0.409	0.392	0.415	0.399	0.409	0.412	0.406	0.402
0.479	0.461	0.487	0.451	0.480	0.462	0.457	0.468	0.475
0.216	0.224	0.212	0.228	0.215	0.224	0.225	0.220	0.218
0.301	0.288	0.306	0.282	0.302	0.288	0.291	0.294	0.298
0.193	0.201	0.190	0.205	0.193	0.200	0.200	0.196	0.196
0.269	0.259	0.275	0.256	0.268	0.263	0.261	0.265	0.267
0.372	0.380	0.367	0.383	0.370	0.378	0.385	0.375	0.374

0.254	0.251	0.256	0.248	0.255	0.250	0.251	0.251	0.254
0.389	0.392	0.393	0.397	0.387	0.398	0.391	0.394	0.390
0.450	0.440	0.455	0.436	0.448	0.442	0.443	0.444	0.449
0.211	0.219	0.212	0.222	0.213	0.217	0.218	0.216	0.213
0.274	0.259	0.279	0.250	0.275	0.258	0.260	0.264	0.272
0.378	0.386	0.372	0.392	0.376	0.389	0.386	0.384	0.379
0.241	0.224	0.251	0.215	0.241	0.225	0.227	0.233	0.237
0.318	0.320	0.314	0.326	0.312	0.325	0.327	0.319	0.320
0.213	0.202	0.219	0.196	0.216	0.201	0.202	0.207	0.211
0.509	0.518	0.502	0.523	0.505	0.518	0.519	0.513	0.511
0.103	0.102	0.107	0.099	0.105	0.101	0.098	0.102	0.103
0.620	0.629	0.614	0.635	0.617	0.629	0.630	0.624	0.622
0.457	0.488	0.497	0.499	0.496	0.499	0.444	0.494	0.461
0.543	0.512	0.503	0.501	0.504	0.501	0.556	0.506	0.539
0.194	0.141	0.236	0.111	0.206	0.143	0.123	0.160	0.187
0.168	0.131	0.163	0.119	0.160	0.122	0.197	0.143	0.164
0.248	0.211	0.187	0.204	0.229	0.229	0.190	0.238	0.224
0.131	0.183	0.189	0.200	0.132	0.188	0.182	0.175	0.141
0.096	0.147	0.085	0.147	0.127	0.102	0.123	0.105	0.113
0.088	0.102	0.082	0.139	0.069	0.133	0.118	0.105	0.090
0.076	0.084	0.058	0.081	0.076	0.083	0.067	0.073	0.082

Urban	Cheerful	Gloomy	Individualistic	Conventional	Friendly	Unfriendly	Healed	Stimulated
0.226	0.220	0.226	0.218	0.225	0.219	0.232	0.217	0.232
0.160	0.156	0.167	0.154	0.170	0.155	0.167	0.158	0.165
0.088	0.087	0.088	0.087	0.087	0.087	0.087	0.087	0.087
0.464	0.455	0.471	0.453	0.474	0.456	0.473	0.458	0.470
0.060	0.058	0.058	0.058	0.058	0.059	0.059	0.058	0.060
0.325	0.335	0.322	0.333	0.323	0.334	0.321	0.335	0.319
0.275	0.270	0.277	0.272	0.277	0.271	0.279	0.270	0.281
0.267	0.283	0.262	0.285	0.260	0.280	0.258	0.281	0.259
0.383	0.362	0.386	0.363	0.385	0.364	0.390	0.361	0.393
0.175	0.182	0.173	0.183	0.174	0.182	0.173	0.181	0.174
0.480	0.464	0.479	0.462	0.477	0.467	0.480	0.464	0.481
0.129	0.129	0.131	0.127	0.132	0.127	0.133	0.128	0.132
0.587	0.586	0.587	0.584	0.587	0.587	0.586	0.587	0.584
0	0.358	0.348	0.359	0.349	0.358	0.349	0.357	0.349
1	0.233	0.238	0.235	0.236	0.236	0.237	0.232	0.242
0.292	1	0	0.310	0.287	0.306	0.285	0.307	0.285
0.410	0	1	0.393	0.413	0.396	0.416	0.396	0.416
0.252	0.264	0.244	1	0	0.264	0.240	0.263	0.244
0.406	0.395	0.414	0	1	0.394	0.417	0.397	0.413
0.468	0.485	0.457	0.490	0.454	1	0	0.484	0.455
0.222	0.213	0.226	0.210	0.227	0	1	0.212	0.229
0.289	0.306	0.287	0.306	0.287	0.304	0.283	1	0
0.202	0.190	0.202	0.191	0.201	0.191	0.205	0	1
0.265	0.274	0.260	0.274	0.259	0.273	0.256	0.273	0.256
0.373	0.368	0.381	0.364	0.383	0.366	0.386	0.369	0.382
0.251	0.256	0.250	0.255	0.249	0.254	0.251	0.254	0.251
0.400	0.390	0.396	0.391	0.393	0.392	0.394	0.390	0.397
0.444	0.453	0.438	0.455	0.436	0.453	0.436	0.452	0.437
0.217	0.212	0.219	0.213	0.219	0.212	0.220	0.212	0.221
0.260	0.279	0.256	0.279	0.255	0.277	0.253	0.277	0.253
0.387	0.373	0.389	0.371	0.390	0.375	0.392	0.374	0.391
0.226	0.249	0.221	0.250	0.221	0.247	0.216	0.249	0.214
0.326	0.314	0.325	0.311	0.323	0.315	0.329	0.312	0.330
0.206	0.219	0.201	0.221	0.200	0.218	0.196	0.218	0.198
0.516	0.503	0.519	0.501	0.519	0.504	0.524	0.502	0.524
0.101	0.106	0.100	0.107	0.099	0.106	0.099	0.105	0.099
0.629	0.614	0.630	0.614	0.630	0.616	0.634	0.615	0.635
0.503	0.494	0.507	0.497	0.499	0.491	0.484	0.489	0.496
0.497	0.506	0.493	0.503	0.501	0.509	0.516	0.511	0.504
0.173	0.224	0.121	0.256	0.105	0.232	0.097	0.214	0.124
0.121	0.179	0.149	0.147	0.159	0.144	0.155	0.173	0.134
0.209	0.202	0.220	0.187	0.244	0.220	0.213	0.230	0.181
0.149	0.163	0.176	0.157	0.172	0.153	0.180	0.163	0.160
0.116	0.091	0.120	0.119	0.125	0.096	0.128	0.094	0.149
0.154	0.078	0.132	0.080	0.119	0.090	0.128	0.075	0.148
0.078	0.063	0.083	0.054	0.077	0.065	0.099	0.051	0.103

Open	Exclusive	Want to reside	Do not want to reside	Warm	Aloof	Fascinating	Not fascinating	Want to play
0.219	0.229	0.226	0.224	0.224	0.223	0.219	0.226	0.214
0.158	0.167	0.158	0.163	0.156	0.170	0.153	0.166	0.153
0.088	0.087	0.087	0.088	0.086	0.088	0.087	0.087	0.087
0.457	0.471	0.461	0.465	0.458	0.472	0.453	0.471	0.450
0.058	0.059	0.059	0.059	0.060	0.057	0.059	0.059	0.058
0.332	0.323	0.330	0.324	0.331	0.319	0.339	0.322	0.340
0.269	0.278	0.274	0.274	0.272	0.279	0.269	0.277	0.265
0.280	0.263	0.274	0.269	0.276	0.264	0.284	0.262	0.292
0.365	0.385	0.372	0.381	0.370	0.388	0.356	0.386	0.350
0.179	0.174	0.179	0.174	0.178	0.174	0.184	0.173	0.184
0.470	0.475	0.471	0.479	0.470	0.475	0.461	0.480	0.459
0.128	0.133	0.130	0.129	0.129	0.131	0.128	0.130	0.127
0.588	0.586	0.586	0.587	0.586	0.585	0.587	0.587	0.588
0.355	0.350	0.356	0.349	0.356	0.347	0.362	0.349	0.360
0.236	0.234	0.235	0.240	0.235	0.237	0.232	0.238	0.229
0.306	0.289	0.301	0.293	0.301	0.289	0.312	0.287	0.317
0.399	0.411	0.403	0.409	0.400	0.411	0.392	0.412	0.386
0.261	0.244	0.256	0.251	0.258	0.248	0.266	0.244	0.271
0.397	0.414	0.402	0.406	0.399	0.412	0.392	0.413	0.386
0.483	0.455	0.474	0.467	0.477	0.458	0.490	0.458	0.498
0.214	0.226	0.220	0.221	0.216	0.224	0.211	0.225	0.205
0.304	0.288	0.297	0.292	0.299	0.288	0.309	0.287	0.315
0.191	0.200	0.197	0.199	0.194	0.202	0.188	0.201	0.182
1	0	0.267	0.266	0.269	0.259	0.275	0.260	0.281
0	1	0.374	0.375	0.372	0.380	0.366	0.381	0.362
0.254	0.250	1	0	0.253	0.249	0.257	0.249	0.256
0.395	0.391	0	1	0.393	0.394	0.388	0.396	0.389
0.452	0.440	0.448	0.444	1	0	0.456	0.439	0.462
0.212	0.219	0.214	0.217	0	1	0.209	0.219	0.207
0.274	0.257	0.270	0.261	0.271	0.256	1	0	0.288
0.377	0.388	0.379	0.386	0.379	0.387	0	1	0.367
0.246	0.223	0.236	0.230	0.241	0.223	0.253	0.222	1
0.317	0.324	0.321	0.324	0.320	0.320	0.313	0.324	0
0.217	0.199	0.211	0.205	0.211	0.202	0.221	0.199	0.225
0.504	0.520	0.512	0.514	0.511	0.516	0.502	0.519	0.495
0.105	0.099	0.104	0.102	0.103	0.100	0.107	0.100	0.108
0.616	0.631	0.621	0.627	0.622	0.629	0.612	0.631	0.607
0.507	0.464	0.490	0.503	0.454	0.518	0.474	0.485	0.473
0.493	0.536	0.510	0.497	0.546	0.482	0.526	0.515	0.527
0.214	0.112	0.185	0.164	0.199	0.131	0.238	0.124	0.265
0.162	0.164	0.163	0.132	0.148	0.144	0.177	0.133	0.173

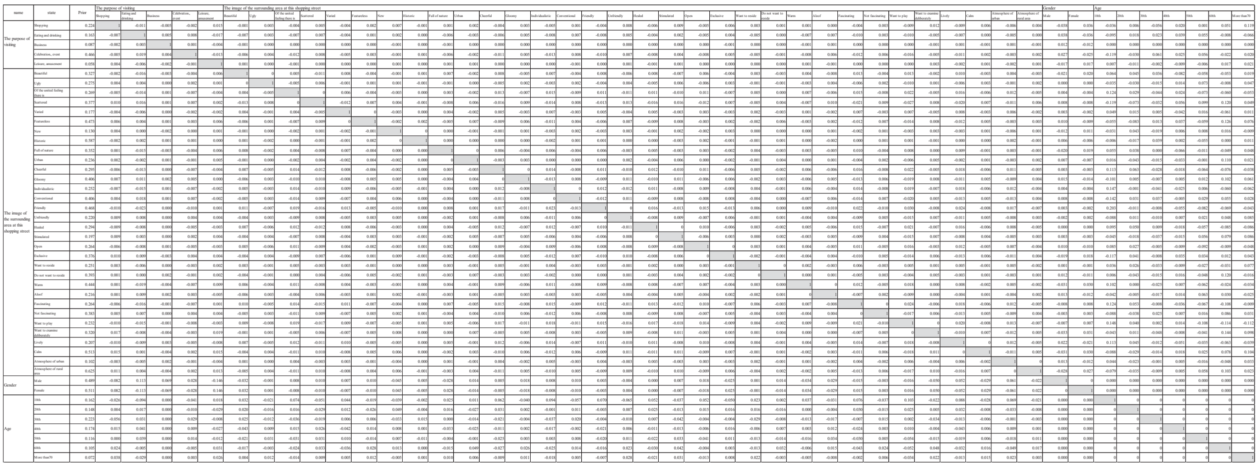
0.219	0.219	0.194	0.215	0.211	0.206	0.217	0.238	0.225
0.168	0.190	0.168	0.181	0.177	0.185	0.150	0.177	0.184
0.076	0.127	0.104	0.102	0.100	0.150	0.087	0.121	0.062
0.102	0.108	0.092	0.137	0.100	0.120	0.062	0.129	0.053
0.059	0.080	0.094	0.069	0.066	0.064	0.069	0.078	0.037

Want to examine deliberately	Lively	Calm	Atmosphere of urban	Atmosphere of rural area
0.235	0.214	0.230	0.218	0.227
0.158	0.156	0.162	0.158	0.163
0.086	0.088	0.087	0.089	0.087
0.461	0.455	0.468	0.462	0.467
0.061	0.057	0.060	0.057	0.059
0.325	0.337	0.324	0.330	0.324
0.276	0.269	0.278	0.274	0.277
0.264	0.286	0.264	0.281	0.265
0.385	0.357	0.385	0.366	0.383
0.172	0.185	0.174	0.182	0.175
0.481	0.461	0.478	0.470	0.476
0.133	0.127	0.131	0.124	0.131
0.586	0.586	0.586	0.588	0.586
0.352	0.361	0.351	0.356	0.351
0.241	0.233	0.237	0.233	0.237
0.290	0.313	0.289	0.306	0.290
0.413	0.395	0.410	0.397	0.409
0.245	0.270	0.246	0.264	0.248
0.411	0.393	0.411	0.393	0.410
0.460	0.492	0.460	0.485	0.461
0.227	0.210	0.225	0.213	0.224
0.286	0.310	0.288	0.302	0.289
0.204	0.189	0.201	0.192	0.200
0.261	0.277	0.260	0.271	0.261
0.382	0.363	0.382	0.365	0.380
0.252	0.256	0.251	0.256	0.250
0.398	0.390	0.394	0.390	0.394
0.445	0.452	0.442	0.449	0.443
0.217	0.212	0.218	0.212	0.218
0.258	0.282	0.258	0.276	0.259
0.389	0.370	0.388	0.375	0.387
0	0.252	0.224	0.245	0.226
1	0.309	0.327	0.308	0.324
0.199	1	0	0.218	0.201
0.524	0	1	0.502	0.518
0.099	0.108	0.100	1	0
0.634	0.609	0.631	0	1
0.439	0.540	0.459	0.550	0.467
0.561	0.460	0.541	0.450	0.533
0.140	0.250	0.134	0.231	0.141
0.153	0.180	0.139	0.115	0.139
0.190	0.211	0.217	0.222	0.220
0.170	0.131	0.180	0.183	0.175
0.101	0.097	0.122	0.098	0.127
0.153	0.073	0.121	0.056	0.123
0.094	0.058	0.086	0.095	0.074

Gender		Age						
Male	Female	10th	20th	30th	40th	50th	60th	More than70
0.186	0.260	0.188	0.229	0.168	0.243	0.224	0.275	0.343
0.200	0.127	0.068	0.181	0.186	0.202	0.218	0.155	0.097
0.100	0.075	0.087	0.087	0.087	0.087	0.087	0.087	0.087
0.492	0.440	0.347	0.435	0.527	0.491	0.522	0.444	0.486
0.041	0.075	0.065	0.047	0.056	0.049	0.053	0.076	0.079
0.305	0.347	0.391	0.371	0.363	0.245	0.268	0.274	0.345
0.275	0.275	0.240	0.245	0.260	0.289	0.348	0.267	0.322
0.274	0.265	0.393	0.298	0.225	0.293	0.197	0.209	0.217
0.385	0.370	0.258	0.304	0.345	0.433	0.476	0.497	0.426
0.179	0.174	0.225	0.192	0.181	0.135	0.193	0.116	0.188
0.482	0.464	0.418	0.390	0.485	0.510	0.414	0.599	0.549
0.118	0.141	0.098	0.173	0.110	0.136	0.138	0.146	0.121
0.593	0.580	0.581	0.569	0.625	0.589	0.532	0.587	0.597
0.332	0.371	0.407	0.390	0.352	0.286	0.341	0.303	0.400
0.242	0.229	0.252	0.192	0.221	0.202	0.234	0.345	0.257
0.299	0.292	0.408	0.358	0.268	0.277	0.231	0.220	0.258
0.420	0.391	0.304	0.410	0.399	0.410	0.417	0.508	0.467
0.256	0.248	0.399	0.251	0.211	0.227	0.258	0.192	0.190
0.414	0.398	0.263	0.437	0.443	0.401	0.435	0.461	0.434
0.470	0.465	0.671	0.457	0.460	0.413	0.386	0.399	0.425
0.218	0.222	0.133	0.231	0.210	0.228	0.242	0.269	0.305
0.294	0.294	0.389	0.344	0.303	0.276	0.237	0.209	0.208
0.200	0.194	0.152	0.179	0.160	0.182	0.253	0.277	0.283
0.274	0.255	0.350	0.291	0.259	0.256	0.172	0.255	0.217
0.357	0.394	0.259	0.417	0.369	0.412	0.410	0.388	0.419
0.252	0.251	0.287	0.278	0.218	0.243	0.224	0.220	0.329
0.404	0.382	0.399	0.350	0.378	0.409	0.345	0.513	0.377
0.413	0.474	0.547	0.444	0.419	0.451	0.383	0.421	0.410
0.229	0.204	0.175	0.211	0.200	0.231	0.279	0.247	0.191
0.256	0.272	0.388	0.317	0.256	0.228	0.197	0.156	0.256
0.381	0.386	0.295	0.345	0.408	0.391	0.399	0.469	0.414
0.225	0.239	0.380	0.272	0.234	0.246	0.124	0.118	0.121
0.287	0.351	0.276	0.331	0.272	0.312	0.279	0.464	0.417
0.229	0.186	0.319	0.252	0.195	0.156	0.172	0.143	0.168
0.482	0.543	0.425	0.484	0.499	0.531	0.538	0.591	0.617
0.115	0.090	0.146	0.079	0.102	0.108	0.086	0.054	0.135
0.596	0.652	0.545	0.589	0.615	0.630	0.683	0.728	0.648
1	0	0.489	0.489	0.489	0.489	0.489	0.489	0.489
0	1	0.511	0.511	0.511	0.511	0.511	0.511	0.511
0.162	0.162	1	0	0	0	0	0	0
0.148	0.148	0	1	0	0	0	0	0
0.223	0.223	0	0	1	0	0	0	0
0.174	0.174	0	0	0	1	0	0	0
0.116	0.116	0	0	0	0	1	0	0
0.105	0.105	0	0	0	0	0	1	0
0.072	0.072	0	0	0	0	0	0	1

APPENDIX 3

Difference of probability



name	state	Prior	The purpose of visiting: Shopping	Eating and drinking	Business	Celebration、event	Leisure, amusement
The purpose of visiting	Shopping	0.224	1	-0.011	-0.005	-0.002	0.015
	Eating and drinking	0.163	-0.007	1	0.005	0.008	-0.017
	Business	0.087	-0.002	0.003	1	0.001	-0.004
	Celebration、event	0.466	-0.005	0.019	0.004	1	-0.013
	Leisure, amusement	0.058	0.004	-0.006	-0.002	-0.001	1
The image of the surrounding area at this shopping street	Beautiful	0.327	-0.002	-0.016	-0.003	-0.004	0.006
	Ugly	0.275	0.004	0.004	0.000	0.002	0.001
	Of the united feeling there is	0.269	-0.005	-0.014	0.001	-0.007	-0.004
	Scattered	0.377	0.010	0.016	0.001	0.007	0.002
	Varied	0.177	-0.004	-0.006	0.000	-0.002	-0.002
	Featureless	0.473	0.006	0.004	0.001	0.003	0.006
	New	0.130	0.004	0.000	-0.002	0.000	0.001
	Historic	0.587	-0.002	0.002	0.001	0.001	0.000
	Full of nature	0.352	0.001	-0.015	-0.003	-0.004	0.006
	Urban	0.236	0.002	-0.002	0.001	-0.001	0.005
	Cheerful	0.295	-0.006	-0.013	0.000	-0.007	-0.004
	Gloomy	0.406	0.007	0.011	0.002	0.005	0.000
	Individualistic	0.252	-0.007	-0.015	0.001	-0.007	-0.002
	Conventional	0.406	0.004	0.018	0.001	0.007	-0.002
	Friendly	0.468	-0.010	-0.023	0.000	-0.010	0.001
	Unfriendly	0.220	0.009	0.008	0.000	0.004	0.004
	Healed	0.294	-0.009	-0.008	0.000	-0.005	-0.003
	Stimulated	0.197	0.009	0.003	0.000	0.002	0.004
	Open	0.264	-0.006	-0.008	0.001	-0.005	-0.003
	Exclusive	0.376	0.010	0.009	-0.003	0.004	0.004
	Want to reside	0.251	0.003	-0.006	0.000	-0.003	0.002
	Do not want to reside	0.393	0.001	0.000	0.002	-0.001	0.002
	Warm	0.444	0.001	-0.019	-0.004	-0.007	0.009
	Aloof	0.216	0.001	0.009	0.002	0.003	-0.005
	Fascinating	0.264	-0.006	-0.016	-0.001	-0.007	0.001
	Not fascinating	0.383	0.005	0.007	0.000	0.004	0.004
	Want to play	0.232	-0.010	-0.015	-0.001	-0.008	-0.003
	Want to examine deliberately	0.320	0.017	-0.008	-0.004	-0.003	0.019
	Lively	0.207	-0.010	-0.009	0.003	-0.005	-0.008
	Calm	0.513	0.015	0.001	-0.004	0.002	0.015
	Atmosphere of urban	0.102	-0.003	-0.005	0.002	-0.001	-0.004
	Atmosphere of rural area	0.625	0.011	0.004	-0.004	0.002	0.013
Gender	Male	0.489	-0.082	0.113	0.069	0.028	-0.146
	Female	0.511	0.082	-0.113	-0.069	-0.028	0.146
Age	10th	0.162	-0.026	-0.094	0.000	-0.041	0.018
	20th	0.148	0.004	0.017	0.000	-0.010	-0.029
	30th	0.223	-0.056	0.031	0.000	0.029	-0.008
	40th	0.174	0.015	0.041	0.000	0.009	-0.027
	50th	0.116	0.000	0.039	0.000	0.014	-0.012
	60th	0.105	0.024	-0.005	0.000	-0.005	0.031
	More than70	0.072	0.038	-0.029	0.000	0.003	0.026

The image of the surrounding area at this shopping street: Beautiful	Ugly	Of the united feeling there is	Scattered	Varied	Featureless	New	Historic	Full of nature
-0.001	0.003	-0.004	0.005	-0.004	0.002	0.007	-0.001	0.001
-0.007	0.003	-0.007	0.007	-0.004	0.001	0.002	0.000	-0.006
-0.001	0.000	0.000	0.000	0.000	0.000	-0.001	0.000	-0.001
-0.006	0.004	-0.012	0.008	-0.005	0.003	-0.001	0.001	-0.006
0.001	0.000	-0.001	0.000	0.000	0.000	0.001	0.000	0.001
1	0	0.005	-0.011	0.008	-0.004	-0.001	0.001	0.007
0	1	-0.005	0.006	-0.001	0.001	-0.001	-0.001	-0.001
0.004	-0.005	1	0	0.006	-0.004	-0.003	0.000	0.003
-0.013	0.008	0	1	-0.012	0.007	0.004	-0.001	-0.008
0.004	-0.001	0.004	-0.005	1	0	-0.003	0.000	0.004
-0.006	0.001	-0.007	0.009	0	1	-0.002	0.002	-0.005
-0.001	0.000	-0.002	0.001	-0.002	-0.001	1	0	0.000
0.001	-0.002	0.000	-0.001	-0.001	0.002	0	1	0.000
0.008	-0.002	0.004	-0.008	0.007	-0.004	0.000	0.000	1

-0.001	0.000	-0.002	0.004	-0.002	0.004	-0.002	0.000	0
0.007	-0.005	0.014	-0.012	0.008	-0.006	-0.002	0.000	0.005
-0.006	0.003	-0.010	0.010	-0.008	0.005	0.005	0.000	-0.004
0.005	-0.003	0.014	-0.010	0.009	-0.006	-0.005	-0.001	0.004
-0.005	0.003	-0.014	0.009	-0.007	0.004	0.006	0.000	-0.004
0.011	-0.007	0.019	-0.016	0.013	-0.005	-0.010	0.000	0.008
-0.004	0.003	-0.009	0.008	-0.005	0.003	0.005	0.000	-0.002
0.007	-0.006	0.012	-0.012	0.008	-0.006	-0.003	0.000	0.004
-0.004	0.004	-0.007	0.008	-0.004	0.003	0.003	-0.001	-0.002
0.005	-0.006	0.011	-0.009	0.004	-0.002	-0.003	0.001	0.002
-0.004	0.004	-0.009	0.007	-0.006	0.001	0.009	-0.001	-0.002
0.003	-0.001	0.005	-0.003	0.003	-0.001	0.000	0.000	0.003
-0.004	-0.001	0.000	0.004	-0.006	0.005	-0.002	0.001	-0.003
0.006	-0.004	0.011	-0.008	0.004	-0.003	-0.001	0.000	0.004
-0.006	0.003	-0.004	0.006	-0.003	0.001	0.002	-0.001	-0.003
0.010	-0.005	0.014	-0.015	0.011	-0.007	-0.004	0.000	0.007
-0.005	0.003	-0.011	0.009	-0.007	0.005	0.002	0.001	-0.004
0.009	-0.008	0.019	-0.017	0.009	-0.007	-0.005	0.001	0.005
-0.001	0.001	-0.005	0.006	-0.007	0.005	0.008	0.000	0.000
0.007	-0.005	0.012	-0.011	0.010	-0.005	-0.005	0.000	0.005
-0.004	0.004	-0.011	0.010	-0.008	0.005	0.006	0.000	-0.002
0.001	0.000	0.004	-0.003	0.003	-0.001	-0.004	0.000	0.001
-0.005	0.004	-0.011	0.010	-0.008	0.004	0.006	-0.001	-0.003
-0.032	-0.001	0.008	0.010	0.007	0.010	-0.045	0.005	-0.028
0.032	0.001	-0.008	-0.010	-0.007	-0.010	0.045	-0.005	0.028
0.032	-0.021	0.074	-0.051	0.044	-0.019	-0.039	-0.002	0.025
0.020	-0.016	0.016	-0.029	0.012	-0.026	0.049	-0.004	0.016
0.025	-0.012	-0.036	-0.019	0.006	0.006	-0.033	0.015	0.000
-0.043	0.009	0.015	0.026	-0.042	0.014	0.008	0.001	-0.033
-0.021	0.031	-0.031	0.031	0.010	-0.014	0.007	-0.011	-0.004
-0.017	-0.003	-0.024	0.033	-0.036	0.028	0.013	0.000	-0.015
0.004	0.012	-0.014	0.009	0.005	0.012	-0.005	0.001	0.010

Urban	Cheerful	Gloomy	Individualistic	Conventional	Friendly	Unfriendly	Healed	Stimulated
0.002	-0.004	0.003	-0.005	0.001	-0.004	0.008	-0.006	0.009
-0.003	-0.006	0.005	-0.008	0.007	-0.008	0.005	-0.004	0.002
0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
-0.002	-0.011	0.005	-0.013	0.008	-0.010	0.007	-0.008	0.004
0.001	0.000	0.000	0.000	-0.001	0.000	0.001	-0.001	0.001
-0.002	0.008	-0.005	0.007	-0.004	0.008	-0.006	0.008	-0.007
0.000	-0.005	0.002	-0.003	0.002	-0.004	0.004	-0.005	0.006
-0.002	0.013	-0.007	0.015	-0.009	0.011	-0.011	0.011	-0.010
0.006	-0.016	0.009	-0.014	0.008	-0.013	0.013	-0.016	0.016
-0.002	0.005	-0.003	0.007	-0.003	0.005	-0.004	0.005	-0.003
0.007	-0.009	0.006	-0.011	0.004	-0.006	0.007	-0.009	0.008
-0.001	-0.001	0.001	-0.003	0.002	-0.003	0.003	-0.001	0.002
0.000	0.000	0.000	-0.002	0.001	0.001	0.000	0.000	-0.003
0	0.006	-0.004	0.006	-0.004	0.006	-0.003	0.005	-0.003
1	-0.003	0.003	0.000	0.000	0.000	0.002	-0.004	0.006
-0.003	1	0	0.014	-0.008	0.011	-0.010	0.012	-0.010
0.004	0	1	-0.013	0.008	-0.009	0.011	-0.010	0.011
0.000	0.012	-0.008	1	0	0.012	-0.012	0.011	-0.008
0.000	-0.011	0.008	0	1	-0.012	0.011	-0.009	0.008
0.001	0.017	-0.011	0.023	-0.013	1	0	0.016	-0.013
0.001	-0.008	0.006	-0.011	0.006	0	1	-0.008	0.009
-0.005	0.012	-0.007	0.012	-0.007	0.010	-0.011	1	0
0.005	-0.007	0.005	-0.006	0.004	-0.006	0.008	0	1
0.000	0.009	-0.004	0.009	-0.006	0.008	-0.008	0.009	-0.008
-0.003	-0.008	0.005	-0.012	0.007	-0.010	0.010	-0.008	0.006
-0.001	0.005	-0.001	0.004	-0.003	0.003	-0.001	0.002	0.000
0.007	-0.003	0.003	-0.002	0.000	0.000	0.001	-0.003	0.004
-0.001	0.009	-0.006	0.011	-0.008	0.009	-0.008	0.008	-0.007
0.001	-0.005	0.003	-0.003	0.003	-0.005	0.004	-0.004	0.005
-0.005	0.015	-0.008	0.015	-0.009	0.012	-0.011	0.013	-0.012
0.004	-0.010	0.006	-0.012	0.006	-0.008	0.008	-0.009	0.008
-0.006	0.017	-0.011	0.018	-0.011	0.015	-0.016	0.017	-0.018
0.007	-0.005	0.005	-0.008	0.003	-0.005	0.009	-0.008	0.011
-0.001	0.012	-0.006	0.014	-0.007	0.011	-0.010	0.011	-0.008
0.003	-0.010	0.006	-0.012	0.006	-0.009	0.011	-0.011	0.011
-0.001	0.004	-0.002	0.005	-0.003	0.004	-0.003	0.003	-0.003
0.004	-0.011	0.005	-0.010	0.005	-0.009	0.009	-0.010	0.010
0.014	0.005	0.018	0.008	0.010	0.003	-0.004	0.000	0.007
-0.014	-0.005	-0.018	-0.008	-0.010	-0.003	0.004	0.000	-0.007
0.011	0.062	-0.040	0.094	-0.057	0.070	-0.065	0.052	-0.037
-0.027	0.031	0.002	-0.001	0.011	-0.003	0.007	0.025	-0.013
-0.014	-0.021	-0.004	-0.037	0.020	-0.004	-0.010	0.007	-0.042
-0.025	-0.011	0.002	-0.017	-0.002	-0.021	0.006	-0.011	-0.013
-0.001	-0.025	0.003	0.003	0.008	-0.020	0.011	-0.022	0.033
0.049	-0.027	0.026	-0.025	0.014	-0.016	0.023	-0.030	0.042
0.006	-0.009	0.011	-0.018	0.005	-0.007	0.028	-0.021	0.031

Open	Exclusive	Want to reside	Do not want to reside	Warm	Aloof	Fascinating	Not fascinating	Want to play
-0.005	0.006	0.003	0.001	0.001	0.000	-0.004	0.003	-0.009
-0.005	0.004	-0.005	0.000	-0.007	0.007	-0.010	0.003	-0.010
0.000	-0.001	0.000	0.000	-0.001	0.001	0.000	0.000	0.000
-0.008	0.005	-0.005	-0.001	-0.008	0.006	-0.012	0.006	-0.016
0.000	0.000	0.000	0.000	0.001	-0.001	0.000	0.000	0.000
0.006	-0.004	0.003	-0.003	0.004	-0.008	0.013	-0.004	0.013
-0.006	0.003	-0.001	-0.001	-0.003	0.004	-0.006	0.002	-0.010
0.011	-0.007	0.005	0.000	0.007	-0.006	0.015	-0.008	0.022
-0.012	0.007	-0.005	0.004	-0.007	0.010	-0.021	0.009	-0.027
0.003	-0.003	0.002	-0.003	0.001	-0.002	0.007	-0.003	0.007
-0.003	0.002	-0.002	0.006	-0.003	0.002	-0.012	0.007	-0.014
-0.002	0.003	0.000	0.000	0.000	0.001	-0.002	0.001	-0.003
0.002	-0.001	-0.001	0.001	0.000	-0.002	0.000	0.001	0.001
0.003	-0.002	0.004	-0.003	0.003	-0.005	0.010	-0.004	0.008
0.000	-0.002	-0.001	0.004	0.000	0.001	-0.004	0.002	-0.006
0.011	-0.006	0.005	-0.002	0.006	-0.006	0.016	-0.008	0.022
-0.006	0.006	-0.002	0.003	-0.006	0.005	-0.013	0.006	-0.019
0.009	-0.008	0.004	-0.001	0.006	-0.004	0.014	-0.008	0.019
-0.008	0.008	-0.004	0.000	-0.007	0.006	-0.014	0.007	-0.020
0.015	-0.013	0.006	0.000	0.009	-0.010	0.022	-0.010	0.030

-0.007	0.006	-0.001	0.001	-0.004	0.004	-0.009	0.005	-0.015
0.010	-0.006	0.003	-0.002	0.005	-0.006	0.015	-0.007	0.021
-0.006	0.003	0.000	0.002	-0.003	0.005	-0.009	0.004	-0.015
1	0	0.003	0.001	0.004	-0.005	0.011	-0.005	0.016
0	1	-0.002	-0.001	-0.004	0.004	-0.010	0.005	-0.014
0.003	-0.001	1	0	0.002	-0.003	0.006	-0.003	0.005
0.002	-0.002	0	1	0.000	0.001	-0.005	0.003	-0.004
0.007	-0.004	0.003	0.000	1	0	0.012	-0.005	0.018
-0.004	0.002	-0.002	0.001	0	1	-0.007	0.002	-0.009
0.010	-0.007	0.006	-0.003	0.007	-0.008	1	0	0.024
-0.007	0.005	-0.004	0.003	-0.004	0.004	0	1	-0.017
0.014	-0.009	0.004	-0.002	0.009	-0.009	0.021	-0.010	1
-0.003	0.005	0.001	0.004	0.000	0.000	-0.007	0.005	0
0.010	-0.008	0.004	-0.001	0.004	-0.005	0.014	-0.007	0.018
-0.009	0.007	-0.001	0.001	-0.002	0.003	-0.011	0.006	-0.018
0.003	-0.003	0.002	-0.001	0.001	-0.002	0.004	-0.002	0.006
-0.009	0.006	-0.004	0.002	-0.002	0.005	-0.013	0.006	-0.017
0.018	-0.025	0.001	0.014	-0.034	0.029	-0.015	-0.003	-0.016
-0.018	0.025	-0.001	-0.014	0.034	-0.029	0.015	0.003	0.016
0.052	-0.050	0.023	0.002	0.037	-0.031	0.076	-0.037	0.103
0.015	0.016	0.016	-0.016	0.000	-0.004	0.030	-0.015	0.025
-0.004	-0.004	-0.029	-0.008	-0.013	-0.017	-0.007	0.015	0.002
-0.006	0.016	-0.006	0.007	0.003	0.012	-0.024	0.003	0.010
-0.041	0.011	-0.013	-0.014	-0.016	0.034	-0.030	0.005	-0.054
-0.004	0.003	-0.013	0.032	-0.006	0.015	-0.043	0.024	-0.052
-0.013	0.008	0.022	-0.003	-0.005	-0.008	-0.002	0.006	-0.034

Want to examine deliberately	Lively	Calm	Atmosphere of urban	Atmosphere of rural area
0.012	-0.009	0.006	-0.006	0.004
-0.005	-0.007	0.000	-0.005	0.000
-0.001	0.001	-0.001	0.001	-0.001
-0.005	-0.011	0.002	-0.003	0.002
0.003	-0.002	0.001	-0.002	0.001
-0.002	0.010	-0.003	0.004	-0.003
0.001	-0.006	0.003	-0.001	0.002
-0.005	0.016	-0.006	0.012	-0.005
0.008	-0.020	0.007	-0.011	0.006
-0.005	0.008	-0.003	0.006	-0.002
0.008	-0.012	0.005	-0.003	0.003
0.003	-0.003	0.001	-0.006	0.001
-0.001	0.000	0.000	0.002	-0.001
0.000	0.009	-0.001	0.003	-0.001
0.005	-0.002	0.001	-0.003	0.002
-0.005	0.018	-0.006	0.011	-0.005
0.008	-0.011	0.005	-0.009	0.004
-0.007	0.018	-0.006	0.012	-0.004
0.005	-0.013	0.005	-0.013	0.004
-0.008	0.024	-0.008	0.017	-0.007
0.007	-0.011	0.005	-0.008	0.003
-0.007	0.016	-0.006	0.008	-0.005
0.007	-0.008	0.004	-0.005	0.003
-0.003	0.012	-0.005	0.007	-0.004
0.006	-0.013	0.006	-0.011	0.004
0.001	0.005	-0.001	0.005	-0.002
0.005	-0.003	0.001	-0.003	0.001
0.000	0.008	-0.002	0.005	-0.002
0.000	-0.004	0.001	-0.004	0.002
-0.006	0.018	-0.006	0.012	-0.005
0.006	-0.013	0.005	-0.009	0.004
0	0.020	-0.008	0.013	-0.007
1	-0.010	0.007	-0.012	0.005
-0.008	1	0	0.012	-0.005
0.011	0	1	-0.011	0.005
-0.004	0.006	-0.002	1	0
0.010	-0.016	0.007	0	1
-0.050	0.052	-0.029	0.061	-0.022
0.050	-0.052	0.029	-0.061	0.022
-0.022	0.088	-0.028	0.069	-0.021
0.005	0.032	-0.008	-0.033	-0.008
-0.034	-0.013	-0.006	-0.001	-0.003
-0.004	-0.043	0.006	0.009	0.001
-0.015	-0.019	0.006	-0.018	0.011
0.048	-0.032	0.016	-0.049	0.017
0.022	-0.013	0.015	0.023	0.003

Gender		Age						
Male	Female	10th	20th	30th	40th	50th	60th	More than70
-0.038	0.036	-0.036	0.006	-0.056	0.020	0.001	0.051	0.119
0.038	-0.036	-0.095	0.018	0.023	0.039	0.055	-0.008	-0.066
0.012	-0.012	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.027	-0.025	-0.119	-0.030	0.061	0.025	0.056	-0.022	0.020
-0.017	0.017	0.007	-0.011	-0.002	-0.009	-0.006	0.017	0.021
-0.021	0.020	0.064	0.045	0.036	-0.082	-0.058	-0.053	0.019
0.000	0.000	-0.035	-0.030	-0.015	0.014	0.073	-0.008	0.047
0.004	-0.004	0.124	0.029	-0.044	0.024	-0.073	-0.060	-0.053
0.008	-0.008	-0.119	-0.073	-0.032	0.056	0.099	0.120	0.049
0.003	-0.002	0.049	0.015	0.005	-0.042	0.016	-0.061	0.011
0.010	-0.009	-0.055	-0.083	0.013	0.037	-0.059	0.126	0.076
-0.012	0.011	-0.031	0.043	-0.019	0.006	0.008	0.016	-0.009
0.006	-0.006	-0.006	-0.017	0.039	0.002	-0.055	0.000	0.011
-0.020	0.019	0.055	0.038	0.000	-0.066	-0.011	-0.049	0.048
0.007	-0.007	0.016	-0.043	-0.015	-0.033	-0.001	0.110	0.021
0.003	-0.003	0.113	0.063	-0.028	-0.018	-0.064	-0.076	-0.038
0.015	-0.014	-0.101	0.005	-0.007	0.005	0.012	0.102	0.061
0.004	-0.004	0.147	-0.001	-0.041	-0.025	0.006	-0.060	-0.062
0.008	-0.008	-0.142	0.031	0.037	-0.005	0.029	0.055	0.028
0.003	-0.002	0.203	-0.011	-0.008	-0.055	-0.082	-0.069	-0.043
-0.002	0.002	-0.088	0.011	-0.010	0.007	0.021	0.048	0.085
0.000	0.000	0.095	0.050	0.009	-0.018	-0.057	-0.085	-0.086
0.003	-0.003	-0.045	-0.018	-0.037	-0.015	0.056	0.079	0.086
0.010	-0.010	0.085	0.027	-0.005	-0.009	-0.092	-0.009	-0.048
-0.019	0.018	-0.117	0.041	-0.008	0.035	0.034	0.012	0.043

0.001	-0.001	0.036	0.026	-0.033	-0.009	-0.027	-0.031	0.077
0.012	-0.011	0.006	-0.043	-0.015	0.016	-0.048	0.120	-0.016
-0.031	0.030	0.102	0.000	-0.025	0.007	-0.062	-0.024	-0.034
0.013	-0.012	-0.042	-0.005	-0.017	0.014	0.063	0.030	-0.025
-0.008	0.008	0.124	0.053	-0.008	-0.036	-0.067	-0.108	-0.009
-0.003	0.003	-0.088	-0.038	0.025	0.007	0.016	0.086	0.031
-0.007	0.007	0.148	0.040	0.002	0.014	-0.108	-0.114	-0.112
-0.033	0.031	-0.043	0.011	-0.048	-0.008	-0.041	0.144	0.098
0.022	-0.021	0.113	0.045	-0.012	-0.051	-0.035	-0.063	-0.039
-0.031	0.030	-0.088	-0.029	-0.014	0.018	0.025	0.078	0.104
0.013	-0.012	0.044	-0.023	-0.001	0.005	-0.016	-0.048	0.033
-0.028	0.027	-0.079	-0.035	-0.009	0.005	0.058	0.103	0.023
1	0	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0	1	0.000	0.000	0.000	0.000	0.000	0.000	0.000
0.000	0.000	1	0	0	0	0	0	0
0.000	0.000	0	1	0	0	0	0	0
0.000	0.000	0	0	1	0	0	0	0
0.000	0.000	0	0	0	1	0	0	0
0.000	0.000	0	0	0	0	1	0	0
0.000	0.000	0	0	0	0	0	1	0
0.000	0.000	0	0	0	0	0	0	1

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Competing Value Framework and Public Administration: Managerial Insights, Theoretical Reflections and Practical Implications from Italy

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Abstract

Competing Value Framework (CVF) is a framework used to assess organizational culture in public administration and it is widely used in health services research to assess organizational culture as a predictor of quality improvement, employee and patient satisfaction, and team functioning. At present the CVF framework has never been tested in contexts where reforming action is vague and is characterized by changes and continuous reflections on the changes introduced. The present study try to fill this gap analysing how CVF works in a context characterized by continued uneven homogeneous reforms. The paper has theoretical and practical implication depicting also suggestions for politicians.

Keywords: culture, organizational culture, competing value framework, public administration, reforms, Italy

1. Introduction

Organizational culture is a key element underpinning any innovative program (Ostroff, Kinicki, & Tamkins 2003). Schein (1999) highlights that organizational culture is hard to schematize, underlining that sufficiently solid hypotheses to test in this field have not been developed yet. Schein (1999) sustains that for a better understanding of organizational culture the description and the analysis of situations play a key role. In literature, a model used to assess organizational culture, contextual factors and relationships within organizations is the Competing Value Framework (Quinn & Rohrbaugh 1983; Quinn 1988; Denison & Spreitzer 1991; Cameron & Freeman 1991; Quinn & Spreitzer 1991; Scott, Mannion, Marshall, & Davies, 2003; Helfrich, Li, Mohr, Meterko, & Sales, 2007). This model has been tested and used in numerous settings with different categories of employees (Quinn & Kimberly 1984; Quinn & McGrath 1985; Quinn & Spreitzer 1991; Zammuto & Krakower 1991; Cameron & Freeman 1991; Di Padova & Faerman 1993; Helfrich et al. 2007). However, in some cases, Authors modified model's dimensions (Helfrich et al. 2007) to reach a better fit with the particular field of application. Furthermore, it is well known in literature that culture is a direct consequence of context (Hofstede 1997). At present the CVF framework has never been tested in contexts where reforming action is vague and is characterized by changes and continuous reflections on the changes introduced. The present study aims to analyze the functioning of the tool with regard to a context characterized by brief duration of political leadership due to high government turnover (Mele & Ongaro 2014), and continued uneven homogeneous reforms. The paper aims to discuss the modifications brought about by context. Suggestions are drawn out for policy makers.

2. Theoretical Background

2.1 Organizational Culture

One of the first definitions of organizational culture was that of Pettigrew (1979, p. 572), who described the concept as a system of "beliefs, ideology language, rituals and myths" that influence the behaviour of an organization. However, scholars proposed several definitions of organizational culture. According to Ostroff et al. (2003) it represents the set of values, norms and beliefs shared by the members of a specific organization, which has a significant influence on the way employees relate to each other and with their work environment. Schein (1985a) considers culture as a set of psychological regulations that directly influence the action of the members of an organization. Moreover for the Author (Schein 1985b), organizational culture is related to the routine procedures that a group learns over time and passes on to new staff members in order to solve problems.

Schein's perception (1985a) is in line with Brown's (1998) assumption which includes in the definition of organizational culture not only values and beliefs, but also the expertise that an organization has developed over time, underpinning how staff members deal with problems. These positions are close to those of Hofstede (1980, p. 25) who considers organizational culture as "the collective programming of the mind which distinguishes the members of one human group from another".

Schein (1992) describes organizational culture as a social force difficult to identify but very powerful to arouse desired behaviours. Subsequently, Hofstede (1997) changed his position on organizational culture, considering it strictly related to the core values distinguishing the members of an organization. Consequently, the Author uses the term *practices* in order to define social and cultural phenomena.

In addition, Schein (1992) considers organizational culture as a multidimensional construct distinguishing between different layers of culture. Based on the difficulty of assessing organizational culture due to its multiple dimensions (Schein, 1992), Hogan and Coote (2014) found that different layers of organizational culture, particularly norms, artefacts, and innovative behaviours, partially mediate the effects of values that support innovation on firm performance. Similarly, Naqshbandi, and Kamel (2017) found that the ability of recognize and use knowledge available outside firm's boundaries mediates the relationship between organizational culture types and open innovation types.

Nevertheless discussing organizational culture is still on the spot especially when facing with topics on the border (Naqshbandi et al., 2015; Feola, Vesci, Botti, & Parente, 2017) or with complex settings (Jennings, 2012; Taylor, 2014). In fact, in line with earlier considerations, empirical evidence shows that organizational culture is a powerful means to induce desired organizational outcomes (Hogan, & Coote, 2014). Homburg and Pflesser (2000) addressed marketing orientation from a cultural perspective. They highlighted an explicit relationship between values and artifacts that support market orientation and market-oriented behaviours. Gregory, Harrisb, Armenakis and Shook (2009) pointed out that organizational culture affects directly customer satisfaction and indirectly organizational effectiveness; at the same time employees' attitude mediates the relationship between organizational culture and organizational effectiveness. This result is an evolution of the study of Siehl and Martin (1990) which underlined that culture influences employees' attitudes and those attitudes, in turn, impact organizational effectiveness. Zheng, Yang and McLean (2010) underlined that knowledge management fully mediates the impact of organizational culture on organizational effectiveness confirming that organizational culture acts differently in different contexts. Focusing on behaviours, O'Reilly III, Chatman and Caldwell (1991) suggested that organizational culture affects employees' behaviours beyond formal control systems, procedures, and authority.

Organizational culture assessment has been based predominantly on the *Competing Values Framework* (CVF) as proposed by Quinn and Rohrbaugh (1981). This framework has been applied in a wide range of managerial and organizational studies, including the investigation of organizational culture, leadership styles and effectiveness, organizational development, human resource development, and quality of life (Quinn, & Kimberly 1984; Quinn, & McGrath 1985; Quinn, & Spreitzer 1991; Zammuto, & Krakower 1991; Cameron, & Freeman 1991; Di Padova, & Faerman 1993, Gregory et. al. 2009).

2.2 The Competing Values Framework

The CVF is an extensively used model in the area of organizational culture research (Yu, & Wu 2009). The framework was originally developed by Quinn and Rohrbaugh (1981) to identify potential criteria for evaluating organizational effectiveness. Based on data provided by a panel of organizational experts, Quinn and Rohrbaugh (1983) used multidimensional scaling to ascertain the basic value dimensions underlying conceptualizations of organizational effectiveness. The resulting spatial model showed three superordinate value continua: flexibility-control (F/C), internal-external (I/E), and means-ends (M/E). The F/C continuum represents the way organizations handle their internal components while simultaneously meeting the external challenges of competition, adaptation, and growth. The dimension synthesizes how much an organization emphasizes centralization and control over organizational processes as opposed to decentralization and flexibility. The I/E continuum represents how well the organization manages the demands for change arising from its environment while simultaneously maintaining continuity. This dimension of competing values expresses the degree to which the organization is oriented toward its own internal environment and processes focusing on the well-being and development of people versus the external emphasis on the overall competitiveness of the organization in sometimes changing environment. The M/E continuum is related to organizational means and ends, from an emphasis on important processes (e.g., planning and goal setting) to an emphasis on outcomes (e.g. productivity).

In a later study Quinn (1988) showed that two of these superordinate continua, control-flexibility and internal-external, were sufficient to describe the effectiveness construct. In summary, the framework posits that two dimensions, each representing alternative approaches to basic challenges that all organizations must resolve in order to function (Denison, & Spreitzer 1991), can characterize most organizations. The combination of the two superordinate continua produces four quadrants that identify four major models of organization and management theory (Quinn 1988):

1. Human relations places a great deal on emphasis on flexibility and internal focus, and stresses cohesion, morale, and human resource development as criteria for effectiveness;
2. Open system emphasizes flexibility and external focus, and stresses readiness, growth, resource acquisition and external support;
3. Rational goal emphasizes control and external focus, and views planning, goal setting, productivity and efficiency as effective;
4. Internal process emphasizes control and internal focus, and stresses the role of information management, communication, stability and control.

The competing values literature suggests that the content of these quadrants reflects the primary value orientations of most organizations (Kalliath, Bluedorn, & Gillespie 1999) and consequently these dimensions are not mutually exclusive. Every organization expresses each dimension to some degree, yet most organizations emphasize some of these dimensions more than others (Quinn, & Cameron 1983; Zammuto & Krakower 1991). For example, organizations that stress trust and sense of belonging tend to be prevalent in the human relations quadrant; leadership style of this type of organizations reflects teamwork, participation and empowerment. Organizations that emphasize adaptation to the external environment tend to be dominant on the open systems dimension; in this type of organizations leaders support strategies of flexibility, growth, innovation, and creativity. Organizations that stress efficiency, performance, task focus, and goal clarity tend to be dominant on the rational goal dimension; organization's leaders focus on tasks and clarity of goals because they believe these values support efficiency and productivity. Internal process organizations emphasize the importance of routine, centralization, control, stability, continuity, and order. Employees are rewarded for observing the rules; in this type of organization leaders measure and document several aspects of work, believing that routine and formality lead to stability, order, and continuity (Quinn, Faerman, Thompson, & McGrath, 1990).

Based on former organizational culture studies in the literature, Cameron and Quinn (2006, p. 28) labelled the four categories respectively as "Clan", "Adhocracy", "Market" and "Hierarchy".

Organizations in which internal focus and control prevail (commonly called hierarchical cultures or bureaucratic cultures) adopt centralized authority over organizational processes, have a clear organizational structure, standardized rules and procedures, strict control, and well defined responsibilities, respect formal hierarchy and adhere to rules. These organizations require a stable and predictable environment. Organizations in which internal focus and flexibility prevail (usually classified as team or clan cultures) encourage broad participation by employees, give emphasis to teamwork and empowerment, and make human resource development a priority. The clan culture is full of shared values and common goals, an atmosphere of unity and mutual help, and an emphasis on employee progression. Organizations in which external focus and flexibility prevail (usually branded adhocracy or entrepreneurial cultures) display creativity and innovativeness. Finally, organizations within which external focus and control prevail (usually labelled market or rational cultures) are characterized by clarity of tasks and goals. Such organizations address attention to efficiency and measurable outcomes.

The CVF model does not specify a preferred organizational culture; it hypothesizes that all four culture types operate at an organizational level and remain relatively stable over time (Denison, & Spreitzer 1991). In fact, the model assumes that the four categories of culture pervade many aspects of an organization, influencing management conduct, the values that link workers with each other and, finally, organizational priorities. Therefore, it is reasonable to expect that the prevalent type of culture could emerge from an analysis of the employees conducted at various levels of the organization (Quinn, & Rohrbaugh 1983; Denison, & Spreitzer 1991).

In order to evaluate the organizational models and the associated culture, the CVF model scales some particular items. The original 16-item tool first validated by Quinn and Spreitzer (1991), used survey data retrieved from executives of public utilities. They concluded that the CVF was reliable and had good construct validity. Later, Kalliath et al. (1999) validated the CVF model in a healthcare setting by administering a 16-item, seven-point Likert-scale version of the classic CVF to 300 managers and supervisors from a multi-hospital system. Their

conclusions were generally consistent with the four-subscale CVF, although they found a high, positive correlation (r = 0.73) between the hierarchical and entrepreneurial subscales. Subsequently Helfrich et al. (2007) used exploratory and confirmatory factor analyses to examine the underlying structure of data from a CVF tool. They analysed cross-sectional data from a work environment survey conducted in the Veterans Health Administration. The study population comprised all staff in non-supervisory positions. The Authors found that entrepreneurial, team, and rational subscales had higher correlations across subscales than within, indicating poor divergent properties. Exploratory factor analysis revealed two factors, and results from confirmatory factor analysis suggested that the two-subscale solution provides a more parsimonious fit to the data as compared to the original four-subscale model.

Although models based on the CVF are the most frequently used in healthcare research to assess organizational culture (Gershon, Stone, Baken, & Larson, 2004), the literature review shows that there has been limited analysis of CVF tools in different contexts with diverse setting. In fact, it is not clear whether the same CVF model is viable when applied to others organizations. The studies mentioned above suggest that there may be problems applying conventional CVF subscales to non-supervisors. Employees did not appear to distinguish between entrepreneurial, team and rational cultures. Probably, a model based on items that generate four subscales cannot be applied to all contexts and scholars (Helfrich et al., 2007). To the best knowledge of the Authors the CVF framework has never been tested in organizations where the organizational rules often changes.

3. Italian Public Administration: An Open-ended Construction Site

Napoleonic countries have a strong administrative tradition (Barzelay & Gallego 2010, Ongaro 2009) that hinders the processes of change in the public sector. As Mele and Ongaro (2014) said Italy is a privileged context in which to analyse the processes of modernization of Public Administrations. Indeed, with its 18 Governments since 1990 today, Italy represents a critical case (Yin 2009) to study the effects of tumultuous alternation in government on public management reform trajectory. During this period, the Italian government has been affected by numerous and recurring regulatory interventions aimed at improving public effectiveness and efficiency (see table 1 for an overview of the main Italian reforms determined by law). The interventions of the Italian legislator can be considered "reform" as defined by Pollit and Bouckaert (2004, p.8): "Public management (PM) reforms consist of deliberate changes to the structures and process of public sector organisations with the objective of getting them (in some sense) to run better". In other words, reforms are all the measures aimed at reshaping the Public Administration (Ongaro, 2009). More specifically, in Italy changes in the rules of operation of Public Administration are the consequence of Government change. Ongaro (2009, p. 10-11) studying reforms path highlights that "The overall impacts of reforms seem to point to some significant degree of (process and system) change in the public sector, but this change is patchy, both within each level of government and throughout the levels of government". He finds four dimensions in which reforms produced changes (Ongaro, 2009, p. 20):

1. "Financial management trajectory (it includes the contents and process of budget formulation as well as the accounting systems);
2. Audit and performance measurement trajectory (the actors, forms and procedures of auditing public sector organizations; the contents of the information about performance of public sector organizations, and their use);
3. Personnel reform trajectory (the features of the civil service in term of the distinctiveness of norms and rules regulating the civil service; the processes whereby civil servants are recruited, evaluated, promoted and rewarded; the procedures of appointment and removal and the decision powers of managers; the responsibility on personnel management and training);
4. Trajectory in organization (encompasses both the overall macro-level configuration of the public sector, in terms of degrees and modalities of specialization and the instruments and mechanism of coordination, as well as in terms of extent of vertical and horizontal decentralization, and the micro-level configuration of the organizational design at the level of individual public sector organizations)".

In the period 1990-2008 Ongaro (2009) identifies six regulatory measures in the financial management area, three regulatory measures about audit e performance management, six regulatory measures about personal management, and nine regulatory measures referred to the organization structure. In the subsequent period (2009-2015), further regulatory measures interested Italian Public Administration and the more relevant are the legislative decree 150/2009, known as "Brunetta reform", and the last reform approved in 2015 (L. 124/2015), known as "Madia reform".

The Legislative Decree 150/2009 intervened incisively on the management of Public Administrations with very broad and pervasive dispositions. The core of the reform was the "Performance Plan" recommending programming (ex-ante) and evaluation (ex-post) in Public Administration. The reform predisposed the creation of a National Commission (CIVIT) responsible for the dissemination of guidelines and best practices, while the assessment was assigned to an independent committee (OIV). The evaluation process involved process results (output), impact on community (outcome) and organizational wellbeing.

At the beginning of 2015, Renzi government received a mandate from the Italian Parliament to draft Public Administration reform (law 124/2015). In contrast with Legislative Decree 150/2009, Italian Parliament set out new principles to reform Italian Public Administration that are still being implemented. As a result, the Italian Public Administration is an organization in continuous change.

This paper aims to fill the gap in the literature represented by the absence of studies on how CVF works in a context in which reforms do not last long. A goal of this paper is to understand if frequently changes in the regulatory system affect organizational culture assessed by the CVF framework. Suggestions for policy makers are drawn out based on effects legislative reforms spread out on the climate and organizational culture.

Table 1. Main Italian reforms between 1990-2015

Financial management	Audit and performance measurement	Personnel management	Organization
Legislative Decree 77/95	Direttiva del Primo Ministro Ciampi 27.01.94 (introduzione della carta dei servizi)	Legislative Decree 29/93	Law 142/90
Law 94/97 followed by Legislative Decree 279/97	Legislative Decree 20/94 and 24/94	Legislative Decree 80/98	Law 241/90
Legislative Decree 76/00	Legislative Decree 286/99	Legislative Decree 165/01	Legislative Decree 29/93
Legislative Decree 267/00	Legislative Decree 150/09	Law 145/02	Law 59/97
DPR 97/03		Legislative Decree 343/03	Legislative Decree 112/98
Law 112/08		Law 168/05	Legislative Decree 300/99
Law 42/09		Legislative Decree 150/09	Legislative Decree 303/99
Law 196/09		Law 124/2015	Legislative Decree 267/00
Legislative Decree 126/14			Law 137/2002
			Legislative Decree 150/09
			Law 124/2015

Adapted from Ongaro (2009)

4. Methods and Data

This study analysed the staff of four local offices of a national public agency[1]. To conduct the present research, a closed end questionnaire was prepared and submitted to the sample of interviewees who were then asked to indicate the extent of their agreement/disagreement with the statements on a 7-point Likert scale.

The questionnaire contained fourteen items adapted from former studies that used the CVF in three different contexts (Cameron, & Freeman 1991; Quinn, & Spreitzer 1991; Zammuto, & Krakower 1991). The wording of some items was adapted to Italian language to improve readability and comprehension.

The questionnaire was submitted to all the staff of four local offices of a national public agency. Incomplete questionnaires (5) were discarded.

The final data set consisted of 85 respondents with the characteristics specified in Table 2.

Table 2. Responding sample

Variable (N=85)	Category	N(%)
Gender		
	Male	45 (52.9%)
	Female	40 (47.1%)
Managerial Status		
	Non-leadership	68 (80.0%)
	Team Leaders	7 (8.2%)
	Supervisor	5 (5,9%)
	Manager	5 (5.9%)
Salary Scale		
	A	3 (3.5%)
	B	30 (35.3%)
	C	46 (54.1%)
	D	1 (1.2%)
	Manager	5 (5.9%)

Three series of analyses on the data have been carried out. First, starting from the classical CVF composition in four subscales, an item analysis has been done to examine subscale reliability and assess the divergent and

convergent properties of the subscales, i.e. the extent to which items correlated within subscales versus across subscales. Second, in order to determine the underlying structure of the items, an exploratory factor analysis (EFA) was performed. Finally, a confirmatory factor analysis (CFA) has been implemented to assess and confirm psychometric properties (i.e., convergent and discriminant validity) of the subscales.

5. Findings

5.1 Item Analysis: the Abandonment of a Four Subscales Structure

Item-to-total correlations met suggested minimum thresholds of 0.20 for all four subscales, indicating that individual items are strongly correlated with their subscales (Table 3). Data showed that item correlation to other subscales is also frequently greater than 0.20. In particular, for the entrepreneurial subscales, correlations to other subscales exceeded the threshold point for eight of the ten items of the other subscales; for the hierarchical, correlation to other subscales exceeded the threshold point for all ten residual items; and for the team and rational subscales, correlations to other subscales exceeded the threshold for nine of the ten items of the other subscales, suggesting poor divergent validity.

Cronbach's alpha for the entrepreneurial, team, and rational subscales is above the conventional thresholds of 0.80. Hierarchical subscales do not meet the minimum of 0.7 showing an alpha statistic of 0.65.

In any event, the item analysis as a whole evidences a low discriminating and/or converging capacity of the various items in the subscales. Cronbach's alpha of the hierarchical subscale is below the predicted minimum highlighting scarce reliability. Evidently, the scale described factors that were insufficient or not mapped exclusively to that particular scale. The outcome implies that a four-factor model does not adapt well to data. Consequently, in order to assess a better fit of the tool an exploratory factor analysis was performed.

5.2 Exploratory Factor Analysis: the Proposition of a Three Subscales and Three Factors Structure

In order to determine the underlying structure of the items an EFA analysis was carried out prior to the analysis of the measurement model. A principal component analysis method with oblique (promax) rotation was put in place with the aim of obtaining several theoretically meaningful factors, given that oblique rotation assumes that factors are correlated to one another, which is more realistic particularly in the social sciences (Hair, Black, Babin, Anderson, & Tatham, 1998). The components were extracted applying the rule of Kaiser (Eigenvalue > 1).

Principal component analysis revealed a three-factor solution (tab. 4). The items from team and entrepreneurial subscale loaded on the first factor (item eight was eliminated due to its low communality). The items with the highest factor loadings on the first factor are item three ("Managers in my facility are warm and caring. They seek to develop employees' full potential and act as their mentors or guides"), item six ("Managers in my facility are coordinators and coaches. They help employees meet the facility's goals and objectives") and item one ("My facility is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks"). These items stress the importance of supporting employees, fulfilling potential and developing high morale.

The items with the lowest factor loadings on the first factor are item nine ("The glue that holds my facility together is formal rules and policies. People feel that following the rules is important"), and item four ("Managers in my facility are risk takers. They encourage employees to take risks and be innovative") and item twelve ("My facility emphasizes growth and acquiring new resources. Readiness to meet new challenges is important").

This factor has been called "dynamism" as it includes different aspects, such as flexibility, shared objectives, attention to human resources (typical of human relations and associated with clan culture), dynamism, risk-taking and tension towards new goals (typical of open systems associated with hierarchical and entrepreneurial culture).

Two of the three items of the rational subscale – item fourteen ("My facility emphasizes competitive actions and achievement. Measurable goals are important") and item ten ("The glue that holds my facility together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared) – load on the second factor. This second factor has been defined "task orientation", since the attention to goal setting, to productivity and to measurability are included in it.

Two of the four items of the hierarchical subscale – item two ("My facility is a very formalized and structured place. Bureaucratic procedures generally govern what people do") and item five ("Managers in my facility are rule-enforcers. They expect employees to follow established rules, policies, and procedures.") – load on the third factor. Since this loading emphasizes formal rules, bureaucracy and procedures, this factor has been named "bureaucracy".

Table 3. Item analysis for culture items and Competing Value Framework subscales

	Mean	SD	Item correlation to subscales				Cronbach's α
			Entrepreneurial	Hierarchical	Team	Rational	
Entrepreneurial	**3.86**	**1.30**					**0.73**
d1) My facility is a very dynamic place and leaves space for personal initiatives	3.76	1.62	0.43	0.28	0.54	0.41	
d4) Managers and office managers in my facility are risk-takers. They encourage human resources to take risks and to innovate procedures to achieve outcomes.	3.59	1.79	0.51	0.32	0.70	0.56	
d8) The glue that holds my facility together is commitment to innovation and development. There is a strong emphasis on being first.	4.25	1.74	0.45	0.39	0.46	0.78	
d12) My facility emphasizes growth and acquiring new resources. Readiness to meet new challenges is important.	3.86	1.87	0.70	0.43	0.84	0.78	
Hierarchical	**4.32**	**1.14**					**0.65**
d2) My facility is a very formalized and structured place. Bureaucratic procedures generally govern what people do.	4.25	1.65	0.15	0.52	0.05	0.22	
d5) Managers in my facility are rule-enforcers. They expect employees to follow established rules, policies, and procedures.	4.78	1.64	0.47	0.59	0.42	0.47	
d9) The glue that holds my facility together is formal rules and policies. People feel that following rules is important.	4.45	1.53	0.64	0.33	0.66	0.58	
d13) My facility emphasizes permanence and stability. Keeping things the same is important.	3.8	1.69	0.12	0.30	0.05	0.19	
Team	**3.9**	**1.56**					**0.82**
d3) Managers in my facility are warm and caring. They seek to develop employees' full potential and act as their mentors or guides.	3.93	1.86	0.69	0.39	0.65	0.66	
d7) The glue that holds my facility together is loyalty and tradition. Commitment to this facility runs high.	4.06	1.71	0.73	0.28	0.62	0.57	
d11) My facility emphasizes human resources. High cohesion and morale in the organization are important.	3.71	1.88	0.80	0.38	0.77	0.72	
Rational	**4.74**	**1.37**					**0.78**
d6) Managers in my facility are coordinators and coaches. They help employees meet the facility's goals and objectives.	4.16	1.90	0.76	0.44	0.83	0.54	
d10) The glue that holds my facility together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared.	5.19	1.38	0.54	0.40	0.53	0.66	
d14) My facility emphasizes competitive actions and achievement. Measurable goals are important.	4.87	1.62	0.54	0.44	0.49	0.66	

Table 4. Exploratory factor analysis findings

Item	Factor 1 - Dynamism	Factor 2 - Task Orientation	Factor 3 - Bureaucracy	Communalities
3) Managers in my facility are warm and caring. They seek to develop employees' full potential and act as their mentors or guides.	**0.849**	-0.045	0.058	0.704
6) Managers in my facility are coordinators and coaches. They help employees meet the facility's goals and objectives.	**0.847**	0.046	0.054	0.779
1) My facility is a very dynamic place and leaves space for personal initiatives	**0.774**	-0.257	0.046	0.470
11) My facility emphasizes human resources. High cohesion and morale in the organization are important.	**0.773**	0.231	-0.130	0.803
7) The glue that holds my facility together is loyalty and tradition. Commitment to this facility runs high.	**0.739**	0.118	-0.198	0.628
12) My facility emphasizes growth and acquiring new resources. Readiness to meet new challenges is important.	**0.683**	0.353	-0.070	0.815
4) Managers and office managers in my facility are risk-takers. They encourage human resources to take risks and to innovate procedures to achieve the outcomes.	**0.673**	0.070	0.016	0.511
9) The glue that holds my facility together is formal rules and policies. People feel that following rules is important.	**0.653**	0.094	0.136	0.553
14) My facility emphasizes competitive actions and achievement. Measurable goals are important.	0.062	**0.840**	0.062	0.789
10) The glue that holds my facility together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared.	0.128	**0.777**	0.016	0.728
2) My facility is a very formalized and structured place. Bureaucratic procedures generally govern what people do.	-0.037	-0.004	**0.891**	0.782
5) Managers in my facility are rule-enforcers. They expect employees to follow established rules, policies, and procedures.	0.502	-0.157	**0.690**	0.747
13) My facility emphasizes permanence and stability. Keeping things the same is important.	-0.348	0.481	0.574	0.558
KMO = 0.853 N = 85 Total explained variance = 68.21%	Explained variance = 47.52	Explained variance = 12.85	Explained variance = 7.84	

Item thirteen ("My facility emphasizes permanence and stability. Keeping things the same is important.") cross-loads on all the three subscales with its values of -0.348 (on the first factor), 0.481 (on the second factor) and 0.574 (on the third factor). This result appears, however, similar to that of Helfrich et al. (2007) in which item thirteen is still presented as a cross-loading. Despite the intersection of the loadings, the highest loading of item thirteen is on the third factor: this outcome is consistent with the fact that factor three represents bureaucracy. In addition, the loading of item thirteen on the first factor is negative, and even this outcome is consistent. In fact, if in the first factor the subscales of team culture and entrepreneurial culture converge, it is evident that an item which measures bureaucracy is negatively correlated with this factor.

5.3 Confirmatory Factor Analysis and Model Measurement Validation

Construct validity of the three factors emerged from EFA has been assessed performing a CFA. In particular, in this

study the partial least squares (PLS) approach (Chin, 1998) has been chosen using the PLS-Graph 3.0 software (Chin, Marcolin, & Newsted, 2003). The minimal demands on measurement scales and sample size considerations guided in the selection of variance-based approach over covariance-based approach such as Lisrel (Joreskog & Sorbom, 1989). In fact, Bentler and Chou (1988) recommend a minimum ratio from five to ten cases per parameter while in variance-based model sample size is reliable if it is ten times the largest number of formative indicators used to measure a single construct (Hair, Hult, Ringle, & Sarstedt, 2013). Being our sample size of 85 is a little bit poor for LISREL analysis, on the contrary it was satisfactory for PLS since the largest subscale in the proposed measurement model of this study has eight items. All items of the three factors were assumed as reflective indicators and a bootstrapping procedure with 100 resamples and 50 cases per sample has been applied allowing us to produce more accurate results. The psychometric properties of the three factors are presented in table 5.

Table 5. Psycometric properties of the three factors solution

Subscale/Construct	Composite Reliability (CR)	Average Variance Extracted (AVE)	Indicator	Factor Loading	T-Statistics
Dynamism	0.932	0.635	3) Managers in my facility are warm and caring. They seek to develop employees' full potential and act as their mentors or guides.	0.821	122.051
			6) Managers in my facility are coordinators and coaches. They help employees meet the facility's goals and objectives.	0.878	248.010
			1) My facility is a very dynamic place and leaves space for personal initiatives	0.623	53.292
			11) My facility emphasizes human resources. High cohesion and morale in the organization are important.	0.896	308.191
			7) The glue that holds my facility together is loyalty and tradition. Commitment to this facility runs high.	0.780	96.986
			12) My facility emphasizes growth and acquiring new resources. Readiness to meet new challenges is important.	0.870	168.704
			4) Managers and office managers in my facility are risk-takers. They encourage human resources to take risks and to innovate procedures to achieve the outcomes.	0.739	86.399
			9) The glue that holds my facility together is formal rules and policies. People feel that following rules is important.	0.713	71.279
Task Orientation	0.911	0.836	14) My facility emphasizes competitive actions and achievement. Measurable goals are important.	0.915	308.588
			10) The glue that holds my facility together is the emphasis on tasks and goal accomplishment. A production orientation is commonly shared.	0.915	308.588
Bureacracy	0.811	0.592	2) My facility is a very formalized and structured place. Bureaucratic procedures generally govern what people do.	0.862	203.646
			5) Managers in my facility are rule-enforcers. They expect employees to follow established rules, policies, and procedures.	0.773	70.428
			13) My facility emphasizes permanence and stability. Keeping things the same is important.	0.667	53.032

Convergent validity determines whether items pertaining to a construct are more related to each other than with items of other constructs and it is considered acceptable when all items loadings are greater than 0.50. In particular, in this study, convergent validity has been assessed by employing factor loadings, composite reliability (CR) and average variance extracted (AVE). Factor loadings were significant and greater than 0.60 for each item. Similarly, as illustrated in Table 5, each CR and AVE value is above the minimum criteria of 0.7 and 0.5, respectively (Garbarino and Johnson 1999; Hair, Black, Babin, & Anderson, 2010), indicating that convergent validity is not an issue and it is well satisfied. In fact, in the present study, CR values ranged from 0.811 to 0.911 while AVE ranged from 0.592 to 0.836.

Discriminant validity detects whether two constructs are really distinct constructs. This study assesses discriminant validity by comparing the square root of the AVE of each construct with its correlation coefficients with other constructs. In particular, this study demonstrated in Table 6 that the AVE from each construct is greater than the variance shared between that construct and the other constructs; thus, following the criteria advanced by Fornell and Larcker (1981), it reveals satisfactory discriminant validity. Overall, CFA results collectively indicate that three constructs measurement properties are more than satisfactory.

Table 6. Factors' correlation and square roots of the AVE

	Dynamism	Task orientation	Bureacracy
Dynamism	**0.797**		
Task Orientation	0.605	**0.914**	
Bureacracy	0.298	0.354	**0.769**

Bolded diagonal values are square roots of AVE

6. Discussion, Implications and Conclusions

6.1 Three types of Organizational Culture Characterize Context Highly Fragmented

The goal of the paper was to verify how CVF works in a context characterized by frequent legislative reforms that change organizational rules in order to understand if a vague reforming action affects the organizational culture. So the paper has two types of implications: the theoretical ones refer to the validity of the CVF framework: the practical ones are connected to the usability of the CVF in context characterized frequent changes.

The analysis has evidenced problems with the convergent/divergent properties of the CVF subscales when applied to staff of an Italian national public agency. The conventional 4-factor model does not fit the data, as revealed by item analysis. However, this is merely an exploratory analysis, as it affected only the staff of four local offices of a national public agency. Therefore, to make the results generalizable, it would be necessary to extend the analysis to employees of other public agencies. During model re-specification, item one was dropped because of its poor reliability and a 13-item, three-factor exploratory model devised. This modified three-factor model may provide an alternative to the CVF subscales for those public organizations affected by processes of change that have not yet acquired a definitive organizational structure.

The factor labelled "dynamism" consists of eight items that highlight the role of coaching for managers and human resource development. These two elements characterize the organizational model *Human relations* linked to a clan culture, aimed to build moral cohesion and commitment and to develop human resources. This factor includes elements that characterize the Open System model, such as item one ("The office where I work is a very dynamic and entrepreneurial place. People are willing to stick their necks out and take risks"), item twelve ("The office where I work emphasizes growth and acquiring new resources. Readiness to meet new challenges is important.") or item four ("Managers in my facility are risk takers. They encourage employees to take risks and to be innovative"), linked to a hierarchical or entrepreneurial culture.

Compared to the original theoretical configuration a clear distinction between the "Human relations" and "Open system organization" models does not seem to emerge. Consequently, entrepreneurial and team culture appear to be mixed up in employees' minds. The functional characteristics of Italian Public Administration are the results of decades characterized by a strong emphasis on procedures. However, as noted in paragraph 2.1, for two decades now, a reform process in the P.A., has been started addressed to introduce a team culture, an entrepreneurial culture and the empowerment of human resources. The blending of the two factors (entrepreneurial and team) into one factor denominated "dynamism" may have been generated by the intense legislative production aimed at reforming the Italian Public Administration, promoting a process of change towards more innovative organizational models and leadership styles. The convergence of items connected with different organizational models in the same factor could be a characteristic aspect of organizations interested in the processes of change, in which, however, these modifications have not yet become established and have not

yet been accepted by employees. The Rational factor is composed of two items that express clearly an organizational model in which the aim is productivity and efficiency and the means to obtain them is the programming and the management of objectives. The identification of this factor is very consistent with the Italian situation, in which one of the reforms of Public Administration (Legislative Decree no. 150/2009), outlines a management model based on the Performance Cycle in which the programming, the objectives and the examination of results are crucial moments of the whole process.

The factor "bureaucracy" is composed of three items that underline the importance of rules and procedures, emblems of an organization that pays attention to internal processes to maximize stability and control. Also this finding was not unexpected in an Italian Public Administration. In Italy, for years the bureaucratic model has been the organizational model of all Public Administrations and even today many management aspects are organized according to this model. The feature of administrative responsibility is a factor driving public organizations towards very formalized organizational models to minimize this kind of responsibility, both for those who are designated to take decisions and for those in positions of control. In this sense, the definition of procedures and rules could not be negative to the extent that the rules and procedures are established to maximize the efficiency and effectiveness of processes, keeping in mind always the results to be achieved and the recipients of the activities.

6.2 New Horizons for CFV Framework, Policy Makers and Executives in Context Highly Fragmented

Regarding to practical implications, the analysis confirmed that dimensions of CVF are not mutually exclusive; every organization expresses each dimension to some degree, yet most organizations emphasize some of these dimensions more than others (Quinn, & Cameron, 1983; Zammuto, & Krakower, 1991). In context characterized by frequent normative changes CVF highlights two opposing forces: innovation and change generated by reforms converging into dynamism; tradition and resistance to change converging into bureaucracy. Task Orientation factor it seems expresses that efficiency, performance, task focus, and goal clarity are accepted values.

The CVF is useful to assess the results generated by the reforming action. Managers have a crucial role in determining the future of this organization. It is possible that in times of change, managers perceive a degree of uncertainty about the future and they do not make a clear choice between traditions (stability) and change (innovation). So, if they stress routinization, centralization, control, stability, continuity, and order, probably the hierarchical model will prevail. If they stress trust, teamwork, participation, empowerment, probably entrepreneurial and team culture will issue. For example in this study it is possible to depict the change process in Italian Public Administration as crossing a river where people can go straight on the other side or frightened in midstream and go back and top managers play a key role with respect to the result. These findings are in line with Naqshbandi, Kaur and Ma (2015) on the role of top managers in promoting organizational culture. Authors (2015, p. 2138) suggest “The top managers tasked with promoting open innovation in the workplace should discourage all the aspects of hierarchy culture and show strong commitment towards the promotion of highly integrative culture in their organizations”.

The Competing Values Framework is a model widely used to assess organizational culture. It is a well-validated model with reliable, generalizable subscale solutions. Most of the studies which use this model were conducted on managers and it is assumed that the findings can also be extended to employees.

However, our findings suggest that not all of the assumptions made in previous works are accurate. First of all, it has been confirmed, as asserted by Schein (1999), that organizational culture is a difficult construct to measure and that in organizations – and probably in individuals – different types of culture coexist at the same time. In other word, this study, in line with other scholars, confirms the difficulty of assessing organizational culture due to its multiple dimensions (Schein, 1992). In fact, Hogan and Coote (2014) found that different layers of organizational culture, particularly norms, artefacts, and innovative behaviours, partially mediate the effects of values that support innovation on firm performance. Similarly, Naqshbandi, and Kamel (2017) found that the ability of recognize and use knowledge available outside firm’s boundaries mediates the relationship between organizational culture types and open innovation types. The consequence of this view is that there isn’t a tool to measure organizational culture “*erga omnes*”, but that the tool for measuring organizational culture should be checked in every new context where it is used. This finding is in line with Helfrich et al. (2007) study, where the difficulty of applying an instrument with four factors in favour of an instrument with only two factors is underlined.

Finally, the findings highlight the diverse characteristics of the organization in which the analysis is conducted. In an organization with a stable organizational structure it is more likely to encounter a clearer distinction

between the different types of cultures, while in organizations affected by organizational changes, the diverse kinds of cultures may overlap and mingle, merely because of ongoing changes.

The limited nature of the sample does not allow generalizations. Further analysis should be conducted expanding both the size of the sample and the type of organizations. The exploratory nature of the research indicates interesting research areas of the CVF to ascertain whether organizational change is a particular phase of the life cycle of an organization in which the types of organizational culture tend to initially overlap to later emerge in a more distinct way when the transformation has been consolidated. This paper collects a further study on the CVF framework assessing the effects of frequent changes in the organizational rules in a public context. Additional research is now needed, in particular by expanding the survey sample to other areas of the Public Administration. Future research areas will include cross-cultural audits to compare what happens to the model in areas characterized by constant reform efforts but in different geographic areas. Furthermore, mediating effects of different layers of organizational culture need to be tested in different geographical areas.

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Notes

Note 1. The agency did not authorize us to disclose its identity.

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Prioritizing Solutions of Sovereign Debt Default in PIIGS

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Abstract

The global economic recession in 2008 triggered an eruption of Europe sovereign debt defaults in Portugal, Italy, Ireland, Greece, and Spain (PIIGS), and these defaults originated from a social welfare expense burden and sovereign debt rollover. In this paper, we detect methods for eliminating the European sovereign debt crisis via the Delphi technique and the Analytic Hierarchy Process. Suggestions from experts include, respectively, "actively lessening government fiscal deficit," "lowering the sovereign debt of PIIGS," and "strengthening the fiscal structure of Eurozone countries." The empirical results correspond with the actual actions of the EMU, especially the reimbursement constraints on PIIGS by the European Central Bank. It is concluded that improving the nation's fiscal structure is important, and the feasible ways to do so include reducing social welfare expense, levying more taxes on the middle class, and improving the quality of labor. Especially, enhancing a nation's debt-credit ratio could increase solvency.

Keywords: sovereign debt default, PIIGS, debt burden

JEL Codes: E50, E60, F33, F34

1. Introduction

Since the US subprime mortgage crisis in 2008, global economic depression speeded up the eruption of European sovereign default. Several European countries faced the collapse of their financial institutions, notably Iceland's banking system, and this issue spread to Greece, Ireland, and Portugal. Many Eurozone countries could not afford large sovereign debts and current account deficits. In addition, rising unemployment depressed the economy and reduced competitiveness, threatening the expulsion of Portugal, Ireland, Greece, and Spain (hereafter, PIIGS) from the Eurozone. In PIIGS, raising inflation, vast fiscal deficits, and debt burdens, sharply deteriorated their economy. The failure of the PIIGS governments to pay back debt in full resulted in sovereign debt defaults. These debt defaults caused panic among other member countries, hurting the rest of Europe even more.

Our motivations come from the stylized facts in the aftermath of European sovereign default. Based on the literature on this topic and judgements from experts, we conclude several possible main methods to eliminate sovereign debt default in PIIGS. Applying the Analytic Hierarchy Process (hereafter, the AHP) to extract weights and the relative importance of causes, we look forward to proposing useful suggestions. We aim at finding out the prominent factors to prevent the eruption of sovereign debt default once again. The outstanding results of this paper are our empirical results correspond with the actual actions of the EMU, especially the reimbursement constraints on PIIGS by the European Central Bank. It is concluded that improving the nation's fiscal structure is important, and the feasible ways to do so include reducing social welfare expense, levying more taxes on the middle class, and improving the quality of labor. Especially, enhancing a nation's debt-credit ratio could increase solvency.

First, we introduce the evolution of the Eurodollar and provide the background of the eruption of European sovereign debt default.

1.1 The European Economic Community (EEC)

After World War Ⅱ, the varied international environment drove economic integration among countries. In 1957, the Treaty of Rome was signed by the founding members: Belgium, France, Italy, Luxembourg, the Netherlands, and West Germany. The resulting organizations were called the European Economic Community (EEC) and the

European Atomic Energy Community (EAEC). They were aimed toward overcoming trade barriers, and allowing free movement of goods, services, and people within the EEC.

1.2 The Economic and Monetary Union (EMU)

The Economic and Monetary Union (EMU) represented a major step in EU economic integration. Launched in 1992, the EMU involved the coordination of economic and fiscal policies, union monetary policy, and union currency (i.e. the euro). While all 28 EU member states took part in the economic union, some countries took integration further and adopted the euro. Together, these countries made up the euro area.

1.3 Treaty on European Union

The Treaty on EU (TEU) is one of the primary European Union treaties along with the treaty on the functioning of the European Union. The TEU set out general principles of the purpose of the EU, the governance of its central institutions, and the rules related to external, foreign, and security policies.

1.4 European Monetary System (EMS)

The European Monetary System (EMS) was established in 1979. After the Bretton Woods system was established in 1971, most of the EEC countries agreed to maintain a stable exchange rate. Preventing exchange rate fluctuations of more than 2.25%, the European "currency snake," most nations of the EEC linked their currencies to prevent large fluctuations relative to one another. The system was replaced by the EMS in 1979, and the European Currency Unit (ECU) was defined. Because of the relative strength of the Deutsche Mark, and the low-inflation policies of the German Bundesbank, all other currencies were forced to follow its lead. Eventually, it was one of the primary forces behind the drive to monetary union (ultimately the euro).

1.5 European Sovereign Debt Crisis

A sovereign debt default is the failure of a government to pay back its debt. Since late 2009, several Eurozone members have been unable to repay government debt in full or have bailed out over-indebted banks under their national supervision without the assistance of third parties such as other Eurozone countries, the European Central Bank (ECB), or the International Monetary Fund (IMF).

Causes of the sovereign debt crisis vary. The debt crisis had an adverse impact on the labor market and threatened the Eurozone economy as well as the entire European Union. In Greece and Spain, the unemployment rates rose up to as high as 27%.

Here, we apply the AHP to measure priority scales through pairwise comparisons, relying on the judgements of experts, and conclude the main possible causes of the sovereign debt default crisis in PIIGS.

2. Literature Review

Literature on the sovereign debt default can be divided into several categories, listed as follows:

2.1 Debating Origins of the European Sovereign Debt Default

If countries in the same region adopt a monetary union policy, but the monetary policy and fiscal policies are not concurrent, then the official union money will not operate well (Rogoff, 2002). In addition, loss of a nation's own monetary policy might result in a significant disadvantage in being a member of a monetary union (Overtveldt, 2011). Member countries in a union have various economic backgrounds, so a union money policy might be not appropriate for every country. In the case of some member countries, the union policy might be too harsh, but it may be too easy for others. This may result in inflation and increased deficits. Therefore, the main cause of European sovereign debt default might be adopting a monetary union policy with no corresponding union fiscal policy.

2.2 Arguing the Eurozone Imbalance

Overtveldt (2011) emphasized five interrelated imbalances in the wake of the Great Recession around late 2009. These imbalances included separately high current account deficits, asset price bubbles with credit over-expansion, fiscal deficits, debt burden, and loss of competitiveness against corresponding trade partners in some countries.

The origins of these imbalances are separately, (1) Credit over-expansion raising inflation and most loans sourced from mortgages, inducing housing bubbles. (2) Member countries in the EU, because of the lowering of tariffs and the union of the official money in this region, made efficient reciprocal transactions and became closer to each other. However, credit expansion and the huge debt burden in EU had hurt EU countries and the rest of Europe.

Hence, as a currency union (i.e., one currency) without a fiscal union (e.g., different tax and public pension rules), the Eurozone design easily reached a crisis state. However, the flexibility of the responses from authorities was limited (De Grauwe, 2011; 2013; De Grauwe and Ji, 2013; Kopf, C., 2011; Calvo, 1988; Eichengreen et al., 2005).

We use "union fiscal policy in Eurozone countries" as a sub-criteria for eliminating European sovereign debt default. Other sub-criteria include "strengthening the fiscal structure of Eurozone countries" and "increasing the competitiveness of Eurozone countries" based on the fact that if some countries are less competitive, this slows their overall economic growth.

2.3 Discussing the Influence of the Great Recession in 2008 on European Sovereign Debt

Some causes of the sovereign debt crisis include the Great Recession of 2008-2012, the real estate market crisis, and asset price bubbles in several countries.

The Debt-to-GDP ratio in PIIGS rose above 60 percent, resulting in higher default risk. Banks lost confidence in PIIGS's willingness to pay and refused to roll over existing debts, causing PIIGS to face an insolvency crisis. Large-scale financial support from the IMF was an attempt to avert default in Greece, Ireland, and Portugal and to impose austerity measures on them. Austerity measures were designed to slow down the growth of public sector debt, implying a government spending reduction and tax revenue increases or both. To obtain loan agreements, these countries should comply with the austerity measures. However, austerity programs were implemented inefficiently.

The interior economic problems of PIIGS included the following:

1. Economic downgrades, the aged-population problem, lower production, and sticky systems in Portugal and Italy. Significant labor emigration reinforced the aged-population problem, further weakening the labor force and lessoning economic growth.
2. In Greece, the main cause of the crisis was debt burden. The Debt-to-GDP ratio in Greece was 175 percent by 2012, the highest in the world. The Debt-to-GDP ratio reduction and budget cutting could avert the sovereign debt default. Government budget deficits could be reduced through spending cuts and tax increases.
3. In Spain, the contributing causes of the sovereign debt crisis included problems

Resulting from interdependence among real estate, the banking system, and local debt. In a large part of Spain, bank loans were real estate mortgages, and one of Spain's main sources of the crisis was the housing bubble. The housing bubbles in Spain induced a banking crisis, worsening local debt, which turned into sovereign debt.

In conclusion, Ireland and Spain should focus on eliminating the real estate bubbles, and Portugal and Italy should both emphasize economic improvement and increasing employment. PIIGS needs to enforce social welfare to raise the economic level of these populations.

Many developed countries have economies immersed in debt. Debt payback ability depends on economic growth, industrial competitiveness, trade surpluses, and government taxation. Obliviously, PIIGS were not qualified in regard to these indicators (Davies and Green, 2010).

We conclude that debt default can be avoided via specific criteria: "raising the nation's debt-credit ratio," "actively lessening government fiscal deficit," and "lowering the sovereign debt of PIIGS."

2.4 Eliminating the Sovereign Debt Crisis with Social Welfare Improvement

European countries were overloaded with huge social welfare expenses, and because of employee's dependence on social welfare subsidies, it was difficult to reduce unemployment. The optimal allocation of welfare and resources could sustain a stable economy. In northern Europe, the social welfare system operated well, but this was not the case in southern Europe.

According to the literature, we summarize key factors related to eliminating sovereign debt default in PIIGS and classify them into four main criteria and twelve sub-criteria. The four main criteria are, separately, "reducing imbalance in Eurozone countries," "reducing the negative influence of common global factors," "enforcement of the nation's own policies," and "lowering sovereign debt default risks." Each main criteria has three sub-criteria.

3. Empirical Methods

Our procedure follows two stages. In the first stage, the Delphi technique is applied to choose the initial criteria, combined with the judgements of experts to detect the main causes of sovereign debt default in PIIGS. In the second stage, we use analyses of the first stage as the foundation of the AHP to extract the weights of the criteria.

3.1 First Stage- the Delphi Technique

The Delphi technique is a communication method, an interactive forecasting method relying on experts' answers to questionnaires. The facilitator designs a questionnaire that is sent to a group of experts and summarizes the results after the questionnaire is returned. Then, the facilitator develops a new questionnaire for the respondent group based on the results, and experts answer questionnaires in two or more additional rounds. A communication process is structures, and the process is effective in allowing experts to revise their earlier answers based on the replies of others in this group. The facilitator provides an anonymized summary of the experts' forecasts from the previous round at each round. During this process, the number of answers will decrease, and the experts will converge towards the "correct" answer. After a predefined stop criterion, the process is stopped, and the mean scores of the final rounds determine the results (Linstone and Turoff, 1975).

3.2 Second Stage- the Analytic Hierarchy Process (AHP)

The AHP measures priority scales through pairwise comparisons and relies on the judgements of experts. Because the characteristics of the AHP are evaluating the weights of each criteria, the results of questionnaires must depend on priority scales to extract whether one important criteria dominates another with respect to a given attribute. In the case of decision-making, decision alternatives comprise many criteria and sub-criteria. Because the criteria may be intangible, it might be not easy to weigh the priorities of the alternatives to obtain their rankings. The questionnaires are designed as pairwise comparisons for the convenience of calculating weights, and we also test the consistency. Hence, the foundation of second stage is the AHP.

Decision making involves many intangibles. Therefore, we apply measurement through pairwise comparisons and judgements from experts to derive priority scales. The scales measure intangibles in relative terms through a scale of absolute judgements by comparing one criteria with another to determine which one is dominant with respect to a given attribute.

Because judgements may be inconsistent, it's important to measure inconsistency and improve their degree of consistency. The relative importance between two criteria is numerically scaled from 1 to 9, where a range from 5 to 9 indicates the proper results (Miller, 1965). The relative scores are shown on Table 1.

Table 1. Relative Scores

Value	Interpretation	Value of a_{ik}
1	Equal Importance	(1,1,2)
2	Between	(1,2,3)
3	Weak Importance	(2,3,4)
4	Between	(3,4,5)
5	Essential Importance	(4,5,6)
6	Between	(5,6,7)
7	Very Strong Importance	(6,7,8)
8	Between	(7,8,9)
9	Absolute Importance	(8,9,9)

Source: Miller (1965)

The procedure for evaluating the methods intended to eliminate the negative impact of the US QE policies on Taiwan is as follows:

Step 1：Checking the consistency

When we perform pairwise comparisons, inconsistencies may typically easily appear. It's necessary to check the consistency via the Consistency Index (C.I.). Satty (1980, 1990, 2008) proposed checking consistency using both the Consistency Index (C.I.) and the Consistency Ratio (C.R.). The consistency index is defined as follows:

$$CI = \frac{\lambda^{K}_{\max} - N}{N - 1} \tag{1}$$

CI：Consistency Index

$\lambda^{K}_{\max}$ ：the maximum eigenvalue of Matrix $\tilde{A}$

N: the number of evaluation criteria considered

The random index (RI) is defined as the consistency index of a randomly generated reciprocal matrix, which is in a scale ranging from 1 to 9 with the reciprocals forced for each matrix size. Table 2 provides the values for the random index. The consistency ratio, $C.R. = C.I./R.I.$, where C.R.<0.1 represents that the inconsistencies are tolerable, and a reliable result may be expected from the AHP. Otherwise, this must be revised and adjusted

accordingly.

Table 2. Random Index

Matrix order	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
RI.	0.00	0.00	0.58	0.90	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

Source: Satty (1990)

Step 2: Structuring of the hierarchy

The hierarchy from top to bottom with the decision goal, followed respectively with the intermediate levels to the lowest level, with objectives from a broad perspective. To get a perfectly consistent comparison judgment and perform pairwise comparison more easily, the number of elements in each level should be less than 7.

Step 3: Design an answer questionnaire for experts

We designed the questionnaires as a pairwise comparison, synthesizing the responses received from the experts. Form a pairwise comparison matrix as follows:

Step 4: Form a square matrix of pair-wise comparison matrix, $\widetilde{A} = \left[\widetilde{a}_{ij}\right]$

Synthesizing pair-wise comparison responses to form a square matrix of pair-wise comparisons, where $\widetilde{A}$. $\widetilde{A}$ is positive, and it is reciprocal if the paired comparison judgment is perfectly consistent. That is, $\widetilde{a}_{ij} = \dfrac{1}{\widetilde{a}_{ji}}, \quad \forall i, \quad j = 1,2\Lambda\ n$.

In matrix $\widetilde{A}$, each entry a_{ij} represents the importance of the ith criterion relative to the jth criterion. If $a_{ij} < 1$ then the ith criterion is less important than the jth criterion; otherwise, the ith criterion is more important than the jth criterion if $a_{ij} > 1$. $a_{ij} = 1$ if two criteria have the same importance.

$\widetilde{A} = \left[\widetilde{a}_{ij}\right]$, $\widetilde{A}$: a square matrix of pair-wise comparison, $\widetilde{a}_{ij} = \left(l_{ij}, m_{ij}, u_{ij}\right)$.

Step 5：Synthesize judgements

Using the geometrical mean average method to synthesize judgements by experts, the equation is as follows:

$$\widetilde{a}_{ij} = \left(\widetilde{a}_{ij}^{1} \otimes \widetilde{a}_{ij}^{2} \otimes \Lambda \otimes \widetilde{a}_{ij}^{n}\right)^{\frac{1}{n}} \tag{2}$$

$\widetilde{a}_{ij}^{n}$：“judgement of $\widetilde{a}_{ij}$ “ from the Nth expert

Step 6：Computing the vector of criteria weights

We use the geometrical mean average method to weight the criteria. In this way, we can also obtain normalization.

$$r_i = \left(\widetilde{a}_{i1} \otimes \widetilde{a}_{i2}\Lambda \otimes \widetilde{a}_{in}\right)^{\frac{1}{n}} \tag{3}$$

$$\widetilde{w}_i = r_i \otimes \left(r_1 \oplus r_2 \oplus \Lambda \oplus r_n\right)^{-1} \tag{4}$$

r_i： geometrical mean in matrix $\widetilde{A}$

$\widetilde{w}_i$：weights of each row in the reciprocal matrix

Step 7：Eliminate intangibles

To optimize each criterion, we have to eliminate intangibles. The advantages of adopting DF_{ij} are objectivity and the fact that the experts' preferences can be ignored.

$$DF_{ij} = \frac{a+b+c}{3} \tag{5}$$

A, b, and c are the upper value u_{ij}, middle value m_{ij}, and lower value l_{ij}, separately.

Step 8：Normalization

To compare the importance of various criteria, we normalize the weights.

$$NW_i = \frac{DF_{ij}}{\sum DF_{ij}} \tag{6}$$

Step 9：The final priorities

Use the priorities obtained from the comparisons to weigh the criteria in the level immediately below. Do this for each element in the level below, and add its weight to obtain this overall priority. By continuing to weigh and add, we can obtain the final priorities of the alternatives in the bottom level.

From steps 1 to 8, we get NW_i and NW_{ij}, and the final priorities of the alternatives in the bottom level, as follows:

$$NW_j = NW_i \times NW_{ij} . \tag{7}$$

4. Empirical Results

First, we constructed the questionnaires using the Delphi technique and analyzed the judgements from the experts, where the evaluation standards are averages that should be larger than 3 and where the coefficients of variation should be less than 0.5. In the first round, we issued 90 questionnaires, returning 70 effective questionnaires, and the response rate was 77.78%. We issued the questionnaires to 21 professors, 49 experts in financial institutions, for which the percentages were, respectively, 30% and 70%. In the second round, the questionnaires were constructed in the AHP. We issued 90 questionnaires, returning 69 effective questionnaires, for which the response rate was 76.67%. We issued questionnaires to 21 professors and 48 experts in financial institutions, for which the percentages were, respectively, 30.43% and 69.57%[1].

4.1 Results of the Questionnaires Using the Delphi Technique

We synthesized the received responses for the pairwise comparison and used the geometrical mean average method to weigh the determination of those factors, corresponding to both the major criteria and the sub-criteria. Through ranking, we chose the top 8 factors as the main possible methods to eliminate sovereign debt default.

Measurement standards: the averages are greater than 3, and the coefficient of variation is smaller than 0.5. The results of the questionnaires are shown in Table 3. If the result is O, this indicates that the experts had consistent opinions. Otherwise, X indicates that they expressed different opinions.

The 8 items of possible causes selected using the Delphi technique are shown in Table 3. Their coefficient variations are all smaller 0.5, representing consistency in the experts' opinions. For the next step, we designed the questionnaire using the AHP method, structured as four criteria and 8 sub-criteria.

4.2 Results of Questionnaire in AHP Method

Since the judgements of the experts reached consistency, we created a pairwise comparison matrix, evaluating the weights of each criteria. The results are shown in Table 4 and Table 5.

As for the criteria of methods for eliminating sovereign debt default in PIIGS, "lowering the sovereign debt default risks (0.50)" was shown to be the most important, and then, sequentially "enforcing the nation's own policies (0.20)," "reducing the negative influence of common global factors (0.16)," and "diminishing the imbalances in Eurozone countries (0.14)."

As for the sub-criteria, the top 5 are, in order, "actively lowering the government's fiscal deficit (0.31)," "lowering the sovereign debt of PIIGS (0.18)," "strengthening the fiscal structure of Eurozone countries (0.12)," "lessening the negative impact of the QE policy in the US and Europe (0.10)," "lowering unemployment to increase economic growth (Portugal, Italy) (0.10)," and "social welfare revolution (0.08)."

[1]Those professors come from college of management in several universities of Taiwan. And experts in financial institutions, almost belonging to Dept. of market analysis in securities companies and banks, cover research fellows, certified investment analysts, and investment advisors.

The results of the AHP are shown in Table 6, where we examine the consistency using CI and CR., showing the (C.R.) and (C.R.H.) of the returned questionnaire were all smaller than 0.1, representing the overall consistency of the judgements from experts.

Table 3. Results for causes chosen using the Delphi technique

Item	Option	Average	Coefficient of Variation	Result
1	Diminishing external shocks (oil price)	3.3	0.20	O
2	Lessening the negative impact from the QE policy in the US and Europe	3.1	0.21	O
3	Union fiscal policy in Eurozone countries	4.3	0.14	O
4	Strengthening the fiscal structure of Eurozone countries	4.7	0.10	O
5	Lowering the sovereign debt of PIIGS	3.7	0.18	O
6	Actively lowering government fiscal deficit	4.5	0.11	O
7	Lowering unemployment to trigger economic growth (Portugal, Italy)	4.8	0.09	O
8	Social welfare revolution	3.6	0.19	O

Table 4. Weight of major criteria and sub- criteria for eliminating sovereign debt default in PIIGS

Goal	weight			Option	weight		
	lower	Medium	upper		lower	medium	upper
Reducing the negative influence on global common factors	0.52	0.82	1.14	Diminishing external shocks (oil price)	1.00	1.30	1.69
				Lessening the negative impact from the QE policy in the US and Europe	1.51	2.04	2.47
Diminishing the imbalance of Eurozone countries	0.57	0.77	1.07	Union fiscal policy in Eurozone countries	0.77	0.92	1.12
				Strengthening the fiscal structure of Eurozone countries	2.02	2.41	2.76
Lowering the sovereign debt default risks	1.46	2.04	2.63	Lowering the sovereign debt of PIIGS	0.94	1.24	1.64
				Actively lessening government fiscal deficit	1.64	2.10	2.44
Enforcing the nation's own policies	0.62	0.79	1.16	Lowering unemployment to trigger economic growth (Portugal, Italy)	1.41	1.94	2.45
				Social welfare revolution	0.97	1.41	1.82

Table 5. Relative weight and ranking

Goal	Weight	Option	Weight	Eliminate Intangibles	Ranking
Reducing the negative influence on global common factors	0.16	Diminishing external shocks (oil price)	0.38	0.06	7
		Lessening the negative impact of the QE policy in the US and Europe	0.63	0.10	4
Diminishing the imbalance of Eurozone countries	0.14	Union fiscal policy in Eurozone countries	0.29	0.05	8
		Strengthening the fiscal structure of Eurozone countries	0.71	0.12	3
Lowering the sovereign debt default risks	0.50	Lowering sovereign debt of PIIGS	0.37	0.18	2
		Actively lessening government fiscal deficit	0.63	0.31	1
Enforcing the nation's own policies	0.20	Lowering unemployment to trigger economic growth (Portugal, Italy)	0.56	0.10	4
		Social welfare revolution	0.44	0.08	6

Table 6. Checking of Consistency Index and Consistency Ratio

	C.I.	Qualified	C.R.	Qualified
Reducing the negative influence of common global factors	0.001	YES	0.001	YES
Diminishing the imbalance of Eurozone countries	0.005	YES	0.01	YES
Lowering sovereign debt default risks	0.001	YES	0.001	YES
Enforcing the nation's own policies	0.02	YES	0.05	YES
Overall consistency	C.R.H.=0.02 <0.1 , satisfying the overall consistency			

From the results of the questionnaire, we find main possible methods by which to reduce the sovereign debt default risk are, respectively, "actively lessening government fiscal deficit," "lowering the sovereign debt of PIIGS," and "strengthening the fiscal structure of Eurozone countries."

The high social welfare expenses in PIIGS and rolling over of debt, the fiscal deficit became worse, and the Debt-to-GDP ratio became higher.

As for "actively lowering government fiscal deficit," Eurozone countries could try to reduce social welfare expenses, thus lowering residents' reliance on social subsidies, deferring the retiring age, and improving the aged-population problem and labor supply problems. Also, levying more taxes from the middle class would further raise the nation's GDP because richer people would consume more with their after-tax income.

"Lowering the sovereign debt of PIIGS" would reduce social welfare expenses and further increase government revenue and solvency.

Furthermore, "actively lowering government fiscal deficit" and "lowering sovereign debt of PIIGS" would raise the nation's debt-credit ratio, thus improving solvency.

5. Conclusions

Using the Analytic Hierarchy Process (AHP) to measure priority scales through pairwise comparisons and the judgements of experts, we summarized the main possible causes of the sovereign debt default crisis in PIIGS.

Based on the literature, we designed a questionnaire and set up the research process to assess the main possible methods by which to eliminate sovereign debt default in PIIGS. We also synthesized the judgements of experts and weighed the criteria.

Our conclusions can be summarized as follows: 1. in regard to all main criteria, the experts stress on "lowering the sovereign debt default risks." 2. In all sub-criteria, the experts emphasize "actively lessening government fiscal deficit," "lowering the sovereign debt of PIIGS" and "strengthening the fiscal structure of Eurozone countries."

The score for "lowering sovereign debt default risks" is the highest, as shown in Table 5, where two of its sub-criteria rank at the top, thus revealing its importance. Our empirical results correspond with actual actions of EMU, especially the reimbursement constraints on PIIGS by the ECB. The AHP reveled the importance of strengthening the fiscal structure of Eurozone countries. We expect our conclusions to offer useful suggestions to reduce the risk of sovereign debt default.

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The Influence of International Education Accreditation on a Graduate Health and Hospital Program

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Abstract

The overriding objective was to compare the influence of Assurance of Learning (AoL), on several graduate students' pedagogical outcomes before and after an international accreditation program. A self-administered questionnaire was employed to collect data from subjects enrolled in a graduate program. Out of 122 graduate students who voluntarily participated in the pretest (2015), only 88 students participated in the posttest (2017). Overall, the students expressed effective AoL in many pedagogical outcomes based on the post-accreditation process. A high positive correlation was observed between the overall effectiveness of AoL and communication skills ($r = 0.875$, $p = 0.01$). Of the pre-accredited group, 56.2% reported effective AoL outcomes; this percentage increased to 77.8%. The pretest and posttest results indicated significant differences in AoL ($p < 0.01$). Health programs accreditation provides effective outcomes on academic as well as personal leadership levels. Continuous implementation and assessment of AoL must be monitored periodically to ensure its successful contribution to health programs and business schools.

Keywords: accreditation, AoL, effectiveness, health and hospital administration, Saudi Arabia

1. Background

One of the major roles of educational programs is to improve the candidates' performance based on their individual capacity through potential outcomes (Darling-Hammond et al., 2005). Program accreditation is a formal process of ensuring that a program meets the minimum quality standards of the profession for which that program prepares graduates for. Hence, accreditation focuses on ensuring an effective program design, achieving the educational objectives, making the student outcomes measurable, creating the rubrics, and analyzing the assessment data (Crawley et al., 2007; Hale, 2011). The emphasis of current educational accreditation lies on improving the overall learning outcomes of students by enhancing innovative assurance of learning (AoL) techniques (Eschenfelder, Bryan, and Lee, 2014; Trifts, 2012). Recently, pedagogical policies are implemented worldwide to reflect the effect on end users. One of the concurrent approaches in assessment involves the process of implementing course content, engaging the stockholders, and involving the experts, particularly in health programs.

While setting up a health program, the overriding role of the academe is to identify the intended learning outcomes. This role primarily ensures that each course, and consequently the program, meets the learning outcomes through specific AoL outcomes in health education. In some science courses like engineering, there is a value of accreditation as suggested by Byrne and others (Byrne et al., 2013). However, the literature proving the effectiveness of graduate health programs after accreditation is scattered and not practically approved. Thus, the current research aimed to compare a graduate program before and after international accreditation by assessing its AoL outcomes.

1.1 Learning Outcomes

What a learner is expected to know, understand, and/or be able to do at the end of a period of an intended learning course is simply known as AoL. In health education programs in Saudi Arabia (SA), AoL has been under consideration, particularly after the inception of the National Commission for Academic Accreditation and Assessment (NCAAA) in 2004. AoL represents central standards that any accredited program must undergo to

maintain effective performance. Thus, AoL has become one of the most frequently discussed topics in tertiary education today (Rubin and Martell, 2009). Learning outcomes have also started to gain importance at the leadership level, consequently driving the development of the national qualifications framework (Zocco, 2011). Learning outcomes gradually lead to a student-centered paradigm, which is the mission of many schools and could be achieved through many ways. Practically, to meet and maintain the program objectives, employers may share better understanding of the acquired knowledge, skills, and competencies to recruit the most competent candidates. Learning outcomes could increase the transparency and comparability among qualification standards. In other words, the AoL mainly examines the high level of knowledge outcomes, but with a particular focus on the academic study results.

1.2 Quality and Health Education Program Accreditation

The urgent need to improve the performance and quality of healthcare organizations was raised by the Institute of Medicine a long time ago; specifically, the Institute argued that initiatives should commence from healthcare professionals and their schools (Chassin and Galvin, 1998). However, Hirose and other researchers proposed that an accreditation system is a remedy element in maintaining standardized healthcare services to practically increase the cohesiveness and coherence of any healthcare system (Hirose et al., 2003).

In a systematic approach, Greenfield and Braithwaite analyzed the nature of health research studies. They found that the professional's attitude toward accreditation was the dominant subject within recent research literature among 10 other scopes of studies (from 2007 onward) (Greenfield and Braithwaite, 2008). The alignment of the course objectives and competencies has been addressed, particularly in communication skills (Brink and Costigan, 2015). When incorporating the essential parts of accreditation, AoL content is always presented. For example, a student engagement model was proposed within the Taiwanese educational system to ensure effectiveness (Hu, Ching, and Chao, 2012). Meanwhile, critical thinking as a major outcome and building quality of culture are indispensable components that ensure learning (Cortese, 2003).

1.3 Accreditation as Triangulation

Demonstrating educational accountability requires valid course content, students' engagement, and stockholders' contribution. Batalden and others highlighted the need to address competency and communication skills within clinical programs, but did not provide a clear model on how to foster such needs (Batalden et al., 2002). The aim behind acquiring such competency is fundamentally based on patients' centeredness philosophy and accurate data collection from the patient experience (Greenfield and Braithwaite, 2008; Makoul, 2003). In addition to other essential domains, such as student engagement, self-learning, and critical thinking, many health programs implement quality culture within the educational system (Adel, 2016; Salmi, 2017).

When conducting accreditation, once the utilization of AoL content is in progress, the successful use of such systems depends extensively on how well those contents integrated within the delivery of pedagogical activities. With the support of the program mission, the educational health programs have the potential to make a significant difference in building effective educational culture, enabling healthcare professionals to perform on logic and scientific bases, and in increasing efficiencies and cost savings for the healthcare system. In SA, after the inception of NCAAA, the culture of education has been initiated by setting up basic education requirements, such as course specification, course reports, and AoL (Alebaikan, 2010; Telmesani, Zaini, and Ghazi, 2011).

2. Methods

2.1 Design

This cohort study incorporated a pretest and posttest design. Prior to accreditation in 2016, a group of graduate students participated in indicating their daily experiences concerning the basic course content based on the accreditation criteria. Then, the same group was surveyed about the impact of such results.

2.2 Procedure

Targeting convenience sample, Master's degree program candidates were invited to participate in a web survey. Details about their experiences were saved until the next year. After the program accreditation, the same candidates were emailed the same survey, yielding 88 valid results.

2.3 Sample

Students who registered in the academic year 2015 were invited to participate in the study voluntarily. They are enrolled in the Master degree Program of Health and Hospital Administration (MHHA) in the College of Business Administration in one of the tertiary educational universities in SA.

2.4 Tool

The web survey contains demographic and academic profiles of the sample. Then, nine domains were assessed based on the five-point Likert scale containing 45 factors. The tool was periodically distributed manually among program quality coordinators to assess the implementation of AoL at the college level. The tool is valid and reliable.

2.5 Analysis

First, basic demographic characteristics were analyzed using descriptive analysis. Each of the two categorical measures was aggregated into one measurement. Then, using SPSS-19, inferential analysis was employed, including Pearson correlation.

2.6 Ethical Approval

This research study was conducted after obtaining the approval of the IRB and the liaison with the concerned departments.

3. Results

Among over 135 graduate students registered in 2015, only 122 voluntarily participated in this survey, yielding a response rate of about 90%. Table 1 presents the basic demographic characteristics of the subjects in two years (2015-2017).

Table 1. Demographic characteristics of the participants (2015–2017)

Demographic characteristics	2015 (n = 122)		2017 (n = 88)	
	n	%	n	%
Male (M)	56	46	40	45
Female (F)	66	54	48	55
Current GPA is A	11	9	10	11
Current GPA is B	108	89	78	89
Current GPA is C	3	2	0	0

In 2015, respondents were almost consistent in their experience when it came to appreciating the value of accreditation. However, in 2017, a slight change in the activities of AoL was observed, as shown in Table (2).

Table 2. Dichotomy analysis of the respondents toward the influence of accreditation on the program

The influence of accreditation on the MHHA	2015 (n = 122)				2017 (n = 88)			
	Yes	(%)	No	(%)	Yes	(%)	No	(%)
Accreditation improves the program outcomes.	118	96.7	4	3.3	85	96.6	3	3.4
Accreditation improves the AoL activities in this program	120	98.4	2	1.6	86	97.7	2	2.3

Table 3 shows the mean and the aggregated agreement and disagreement responses of the different domains associated with AoL between 2015 and 2017. Generally, responses opted for acquisition in many domains after accreditation.

Table 3. Analysis of different domain results based on accreditation (2015–2017)

	2015					2017				
Domain*	M	A	%	D	%	M	A	%	D	%
Cognitive level of learning	3.62	98	80.1	24	19.9	3.77	104	85.3	18	14.7
Subject (Course) syllabus	3.25	85	69.8	37	30.2	4.59	112	91.8	10	8.2
Communication skills	3.29	86	70.3	36	29.7	3.23	79	64.6	43	35.4
Student engagement	2.99	91	74.8	31	25.25	4.11	100	82.2	22	17.8
Competency	4.35	106	87.1	16	12.9	4.62	113	92.4	9	7.6
Self-learning	2.57	61	50.4	61	49.6	3.11	76	62.2	46	37.8
Critical thinking	4.19	102	83.3	20	16.7	4.18	102	83.6	20	16.4
Quality culture	4.12	101	82.4	21	17.6	3.87	94	77.4	28	22.6
AoL implementation	3.54	69	56.2	53	43.8	3.6	95	77.8	27	22.2
Overall	3.55	NA	72.71	NA	27.29	3.90	NA	79.7	NA	20.3

*M = mean, A = agreement score (accumulative), D = disagreement score (accumulative)

A correlation analysis was conducted to investigate the relationships among the domains of AoL. Table 4 provides the Pearson correlation matrix among students' overall assimilation scale scores and the nine domain ratings.

Table 4. Pearson correlation matrix among the domains associated with AoL

Variable	CLL	SS	CS	SE	CO	SL	CT	QC	AoL
CLL	1.00	0.661*	0.802*	0.013	0.760*	0.245	0.329*	0.365	0.640*
SS		1.00	0.231	0.421	0.586*	0.365	0.521	0.529*	0.583
CS			1.00	0.325	0.499*	0.258	0.452*	0.258	0.875*
SE				1.00	0.441	0.021	0.499*	0.693	0.662
CO					1.00	0.391	0.875*	0.584	0.363
SL						1.00	0.785*	0.296	0.354
CT							1.00	0.758*	0.586*
QC								1.00	0.580
AoL									1.00

$p < 0.01$ for the model; CLL = cognitive level of learning, SS = subject syllabus, CS = communication skills, SE = student engagement, CO = competency, SL = self-learning, CT = critical thinking, QC = quality culture, AoL= AoL implementation

4. Discussion

In this study, the question of whether the promise of an effective AoL process was helpful in delivering health programs was addressed. The results were categorized by various factors depending on the overall objectives of AoL and students' acquisition. The overall findings of the results were not different from that identified in the literature. Most of the reports on the subjects identified effective and worthwhile outcomes in many pedagogical aspects. However, two influential areas were observed: an area with a strong effect and an area with less or no effect.

Communication skills, a fundamental competency among healthcare professionals, exhibited a rational effect in this research (Makoul, 2003). This result is consistent with those presented in many studies (Bylund, 2016; Bylund et al., 2017; Kissane et al., 2012). Evidently, communication skills cannot be achieved without referring to leadership commitment and faculty support in developing a quality program with continuous improvement elements. This skill-set is also an important consideration for academics. This effect is rather unique as the rate of medical errors is also associated with communication skills, but interpersonal and communication skills still result in effective information exchange and team building with patients, their families, and other health professionals (Makoul, 2003). This could be explained by two main issues. The first issue is related to the nature of the candidates as they normally graduate from a health school, and the second issue is related to the endeavors of the faculty to meet the program objectives based on the program objectives.

Enhancing the cognitive skills of the candidates is the major objective of any educational institution, particularly a graduate health program (Greenfield and Braithwaite, 2008; Hollin et al., 2008). As a result of competitive and accreditation demands, the utilization of rapid technology, the philosophy of education, and the growing knowledge transformation have had a profound effect on the students and faculty members, particularly the social media, whether as a result of national or international requirements (Otara, 2014).

As the results indicated no or minor relationships with several domains, such as course syllabus and self-learning, evidence shows that such domains have already become the major parts of the education process in the SA educational system (Al-Asmari, 2005; Bendania, 2011). Still, utilizing the AoL within the healthcare program context faces certain challenges. For example, results showed that competency and student engagement were not well affected by accreditation. Again, what is needed from the accreditation body is to ensure a shift toward an evolutionary effect on the student rather than the program, though accreditation is helpful tool to well performance (Almasabi and Thomas, 2016). However, this study did not identify any clue that competency was well addressed, based on the student experience. Institutional emphasis on research output rather than traditional academic values may increase the chasm while assessing the value of accreditation in health and business schools (Ryan and Guthrie, 2009). In response to this, some studies have proposed that several graduate schools may modify their practice and school mission based on overall educational strategy (Dawson, Burnett, and O'Donohue, 2006; Engebretsen, Heggen, and Eilertsen, 2012). Such principles are considered important in the field of academics, but how to increase its significance is still a major concern and may need further investigation. The opportunities for better learning outcome in the higher education sector still need to be thoroughly discussed from students' perspectives (Alonazi et al., 2016).

5. Conclusion

This paper presented the survey results obtained from cohort studies on quality assurance and learning outcomes, which were part of the MHHA program mission. The management of the health program periodically assessed the achievement of such a standard through qualitative and quantitative approaches, which addressed the

question of what stakeholders expect from quality assurance in educational initiations in connection with learning outcome. This study defined the role that should be played by learning outcomes in external quality assurance and how they should be considered within the scope of external quality assurance. Finally, health policies may contribute to the assessment of the content of accreditation, particularly those related to program management and academic professional engagement

6. Limitations

Some of the limitations of this study included the limited sample, tailored survey design, and specific period of the data collection. Further research studies may focus on actual health college candidates rather than the program itself. The influence of accreditation on gender in the health education program should be further investigated.

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A Conceptual Framework for Islamic Institutional and Retail Investment in Maritime Assets

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Abstract

The purpose of this research is to provide a conceptual framework for Islamic institutional and retail investment in maritime assets. Our objectives are to provide an introduction to seaborne trade and analyze trends in institutional interest in alternative assets and international shipping as well as highlight Islamic and conventional equity structures for institutional and retail investors. Our findings reveal that an Islamic private equity framework involving an unlevered, tax-free investment in maritime assets provides a real alternative to conventional lending and even successful tax-efficient conventional equity structures, since they are not entirely without issues given the significant presence of debt financing from maritime banks. There is a demand for alternative sources of finance, such that Islamic equity finance, rather than conventional lending or structured debt can develop international shipping involving Islamic institutional and retail investment in maritime assets.

Keywords: Islamic finance, investment, international shipping

1. Introduction

Seaborne trade is fundamental to globalization: 84% of global trade, representing 11,128 million tonnes, is carried by international shipping totaling 1.75 Bn DWT, 87% of which, is carried by the primary shipping segments involving are bulkers (43%), tankers (31%) and containerships (13%): however, 75% of ship-finance is financed on a conventional basis and Malaysian Islamic financial institutions (IFIs) and investors have essentially no exposure to international ship-financing (Abdullah, 2016). In order to determine the willingness and ability to finance maritime assets, investors must understand the associated risks and rewards with regard to international shipping associated with equity structures, as an alternative to risk-free debt finance. In order to facilitate an understanding of international shipping, we begin with an overview of the importance of global seaborne trade and identifying the primary shipping segments involving bulkers, tankers and containerships (section 2). We also analyzed trends in institutional interest in alternative assets and shipping (section 3). We then identify a suitable investment framework for Islamic private equity institutional investors (section 4) and for retail investors involving Islamic finance institutions (section 5). We have also analyzed successful precedents with regard to tax-efficient equity investments in Norway (section 6) and in Germany (section 7). Finally, we provide some concluding remarks and recommendations (section 8).

2. Overview of Seaborne Trade

Essentially, growth fundamentals drive shipping investment returns. On average, since 2009 (post financial crisis) approximately 84.5% of global trade is carried by the international shipping industry (table 1), with 2016 maintaining a constant trend at 84%, representing 11,128 million tonnes (table 1, figure 1), although the forecast for growth in 2017 is expected to soften slightly to 2% year-on-year (figure 1).

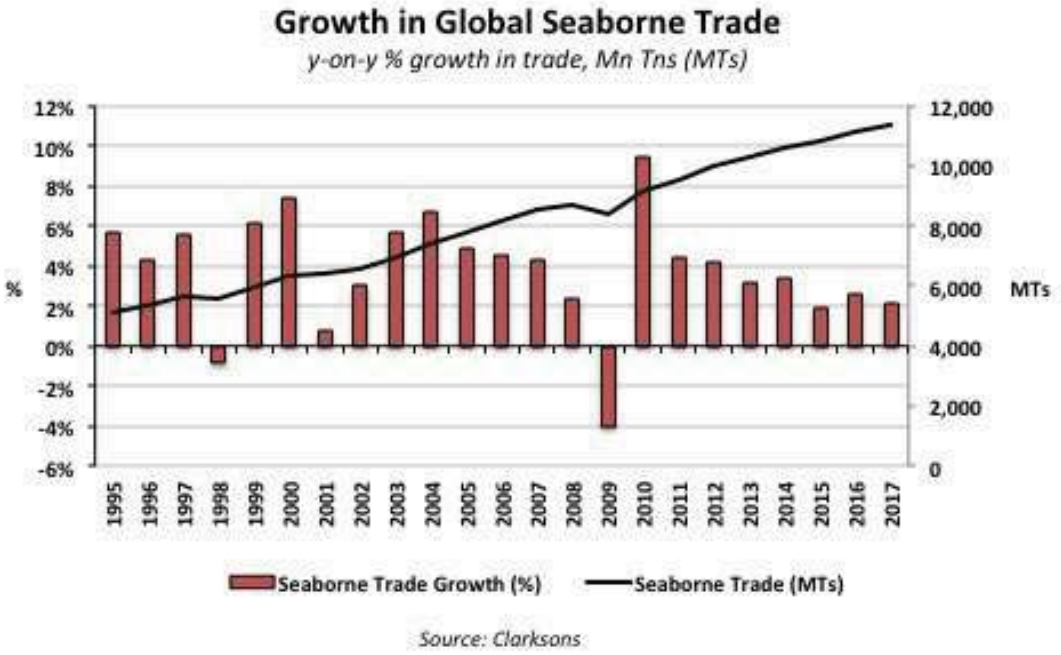
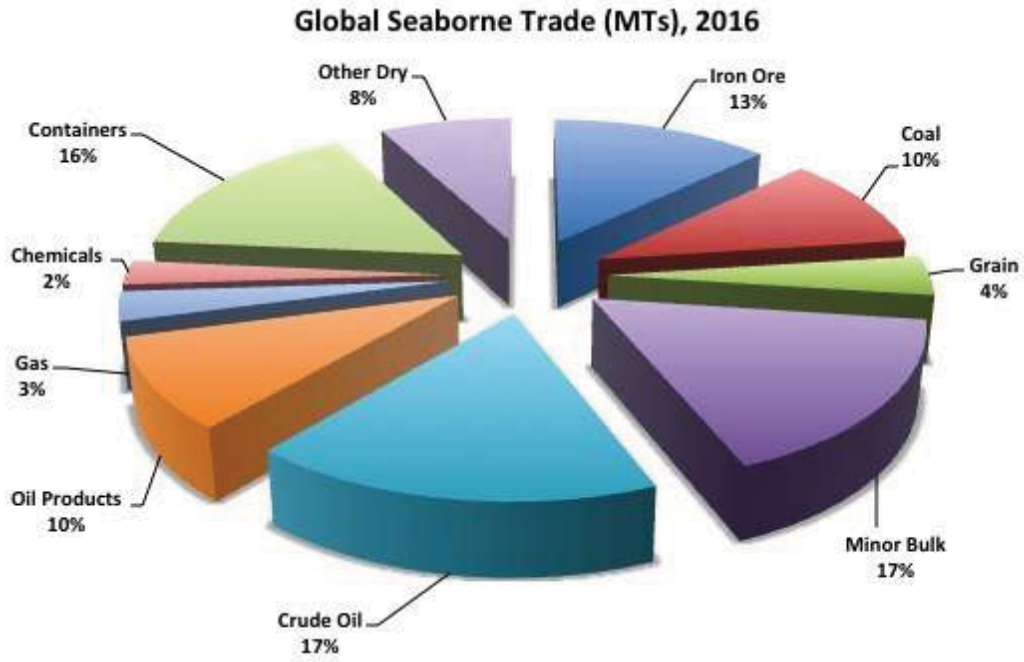


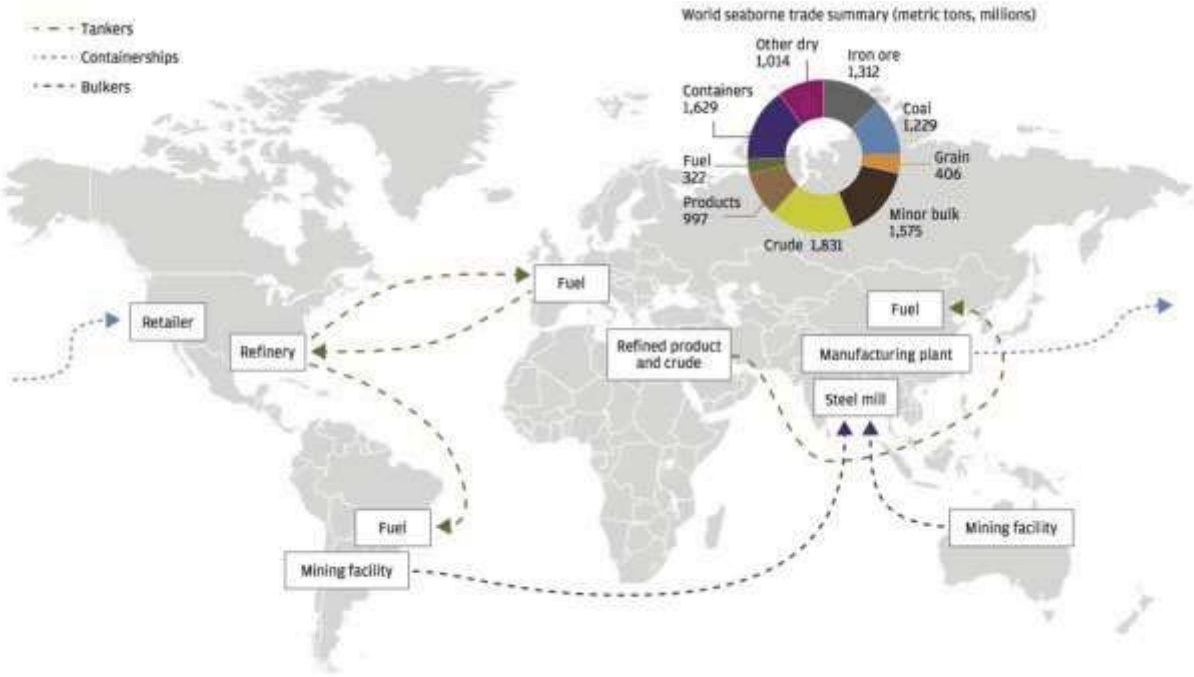
Figure 1. Global Seaborne Trade and Growth, 1995-2017



Source: Clarksons

Figure 2. Composition of Global Seaborne Trade, 2016

In any case, globalization could not succeed without the development of the maritime industry, transporting goods on the scale necessary for the modern world. Energy, electricity and steel production underpin industrial development, hence the primary need for oil, coal and iron ore (figure 2) within the composition and patterns of seaborne trade (figure 3).



Sources: J.P. Morgan (2015), Clarksons

Figure 3. World Seaborne Trade

The global population already exceeded 7.0 billion in 2011 (table 1) and reached about 7.5 billion by 2016. Given that world seaborne trade grew to 11.1 Bn tones by then, international shipping is carrying 1.5 tonnes on average for every person in the world today, a trend that has been steadily increasing over the years. Typically, OECD industrial production is a leading indicator to global GDP and also the IMF forecasts a 3.4% growth for 2017 coupled with a firmer trend towards 2021 (figure 4).

Table 1. Global Seaborne Trade and Analysis

Seaborne Trade per Capita	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
World Seaborne Trade (Mn Ts)	8,355	9,148	9,554	9,946	10,286	10,637	10,841	11,128
World Population (Mn people)	6,846	6,930	7,013	7,098	7,182	7,266	7,349	7,428
Trade, Tonnes per Capita	1.22	1.32	1.36	1.40	1.43	1.46	1.48	1.50
Bulk Trade Tonnes per Capita	0.89	0.95	0.98	1.01	1.03	1.04	1.05	1.06
Container Trade per Capita	0.17	0.19	0.20	0.21	0.22	0.23	0.23	0.24
Seaborne Trade Multipliers								
World Seaborne Trade Growth	-4.00%	9.48%	4.45%	4.09%	3.43%	3.39%	1.93%	2.65%
World GDP Growth	0.00%	5.40%	4.20%	3.50%	3.30%	3.40%	3.10%	3.10%
Seaborne Trade/GDP Multiplier	-	1.76	1.06	1.17	1.04	1.00	0.62	0.85
Industrial Production Growth	-13.3%	8.0%	2.4%	-0.1%	0.4%	2.0%	0.7%	0.2%
Seaborne Trade/IP Multiplier	0.30	1.18	1.85	-40.92	8.57	1.70	2.75	13.24
Trade (billion tonnes)								
World Seaborne Trade	8.36	9.15	9.55	9.95	10.29	10.64	10.84	11.13
World Total Trade (all modes)	9.56	10.82	11.54	11.83	12.19	12.58	12.88	13.18
Seaborne Trade as % of Total	87%	85%	83%	84%	84%	85%	84%	84%

Source: Clarksons

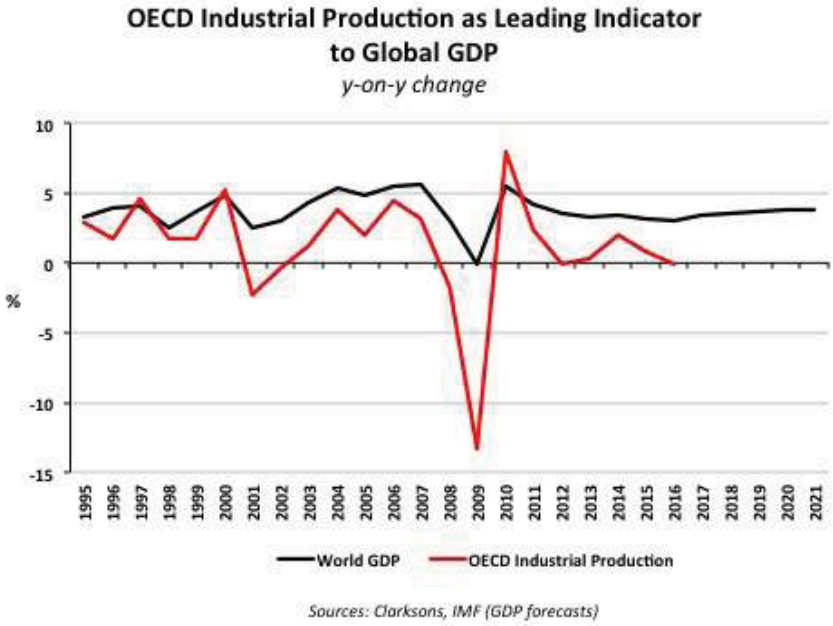


Figure 4. OECD Industrial Production as Leading Indicator to Global GDP

Thus international shipping carries goods for industrial production and finished products for the consumer in an increasingly urbanized world. In terms of economic outlook (market demand), shipping is a growth industry and reflected in the three primary shipping segments (market supply), as ratio of the overall size of the world fleet (1.75 Bn DWT), involving bulkers (43%), tankers (31%) and containerships (13%), totaling 87% (figure 5).

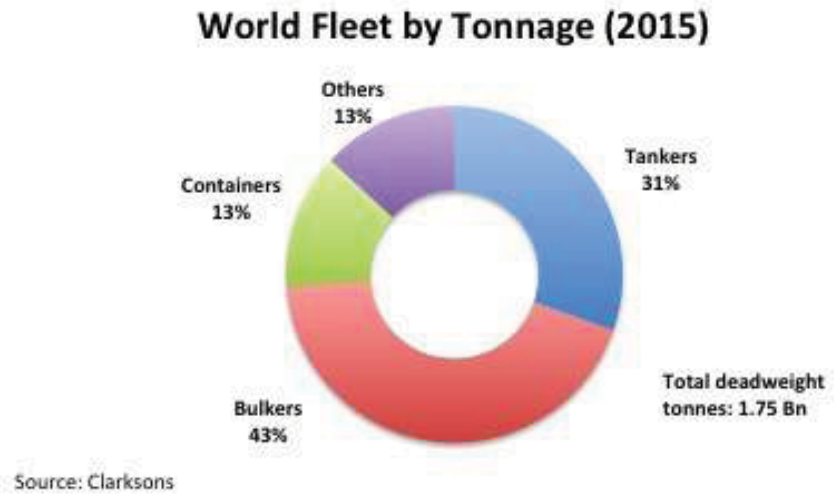
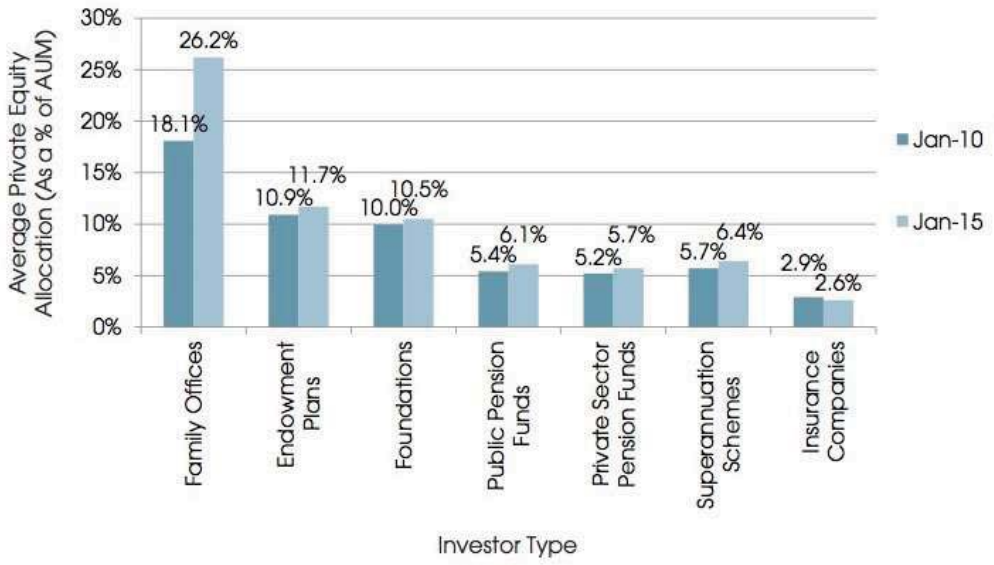


Figure 5. World Fleet in Deadweight Tonnes (2015)

3. Institutional Interest in Alternative Assets and Shipping

With capital market expectations and returns yielding close to zero (U.S.) or even negative (EU and Japan), coupled with domestic liquidity constraints for larger Pension and Investment (P&I) funds, the switch from financial assets to real assets has been evident in recent years. In terms of asset allocation, by 2013, the value of global alternative assets was UD 7.9 Tn, of which PE was USD 3.6 Tn: since 2013, PE firms have raised USD 500 Bn annually, with USD 1.3 Tn of uninvested commitments totaling USD 1.3Tn (Peqin, 2015; Bain & Co., 2016). U.S. and European family offices maintain the highest current allocation (26.2%) as a percentage of their total assets when compared to other investor types (figure 6). Banking regulations do not inhibit them given that they have fewer restrictions and more flexibility with their investment decisions than other investor types, making them attractive to GPs.



Source: Peqin (2015)

Figure 6. Allocation to PE by Investor Type (As a Proportion of AUM), 2010 *vs*. 2015

However, even conservative foundation and pension funds are increasing asset allocations to alternative assets generally and PE fund specifically. Of the 16 major national pension markets (P16), whist total USD 36,119 Bn in pension assets and account for 84.4% of GDP of their economies, seven of the largest pension markets (P7) represent 33.769 Tn, or 93.5%, of the P16 markets (table 2). Malaysia is comprised largely of EPF (public pension fund) and also KWAP (Government pension fund).

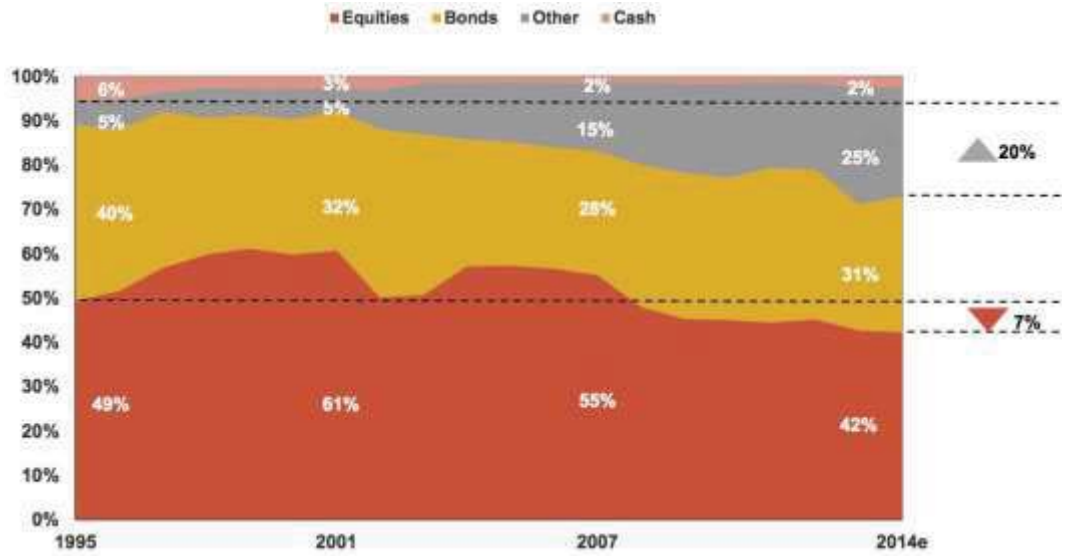
Table 2. Global Pension Assets

Country	Total Assets 2014 (USD billion)	% GDP (in USD billion)
Australia*	1,675	113.0%
Brazil	268	12.0%
Canada*	1,526	85.1%
France	171	5.9%
Germany	520	13.6%
Hong Kong	120	41.2%
Ireland	132	53.7%
Japan*	2,862	60.0%
Malaysia	205	60.7%
Mexico	190	14.6%
Netherlands*	1,457	165.5%
South Africa	234	68.6%
South Korea	511	35.3%
Switzerland*	823	121.2%
UK*	3,309	116.2%
US*	22,117	127.0%
Total	36,119	84.4%

Note: * = P7 pension national pension market

Source: Willis Towers Watson (2015)

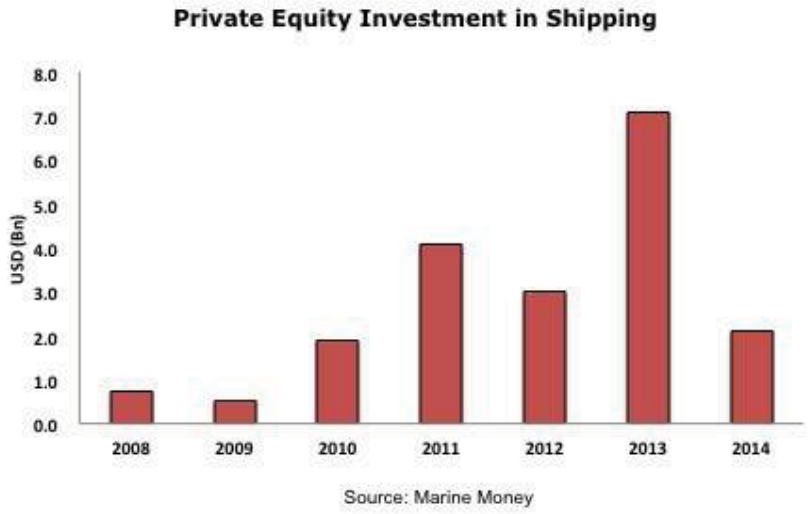
Since 1995, P7 asset allocations in bonds, equities and cash have reduced (figure 7), while other alternative asset allocations have increased from 5% to 25% (Willis Towers Watson, 2015, p.26). In 2013, the top 100 alternative asset managers, ranked by AuM, managed USD 3.27 trillion for their investors (Willis Towers Watson, 2014, p.2). Pension Funds are the largest investors in alternative assets (33%), or USD 1.088 Tn (Willis Towers Watson, 2014, p.16).



Source: Willis Towers Watson (2015, p.26)

Figure 7. Aggregate P7 Asset Allocation (1995-2014)

Post global financial crisis, a number of hedge funds, private equity firms, HNWIs and P&I funds have increasingly become investors in shipping (Steeman, 2013). P&I funds generally look for stable cash-flows, HNWIs seek additional growth opportunites and diversifition, whilst conventional hedge fund and private equity (PE) firms are willing to invest in all aspects of the capital structure. According to Marine Money data, from 2008-2014, PE firms invested a total of about USD 19.2 Bn (figure 8). Generally, PE are making direct investments through common and preferred equity, as well as acquisitions, joint ventures, mezzanine and subordinated debt financing, bridge financing, sale-and-leaseback transactions, and acquisition of distressed shipping debt, often followed by enforcement or restructuring. In 2013 alone, PE invested in about USD 7.1 Bn of maritime assets, of which USD 3.1 bn was in maritime debt (Imhof, 2014) an increasing feature of conventional PE investment in shipping since 2012.



Source: Imhof (2014, p.4)

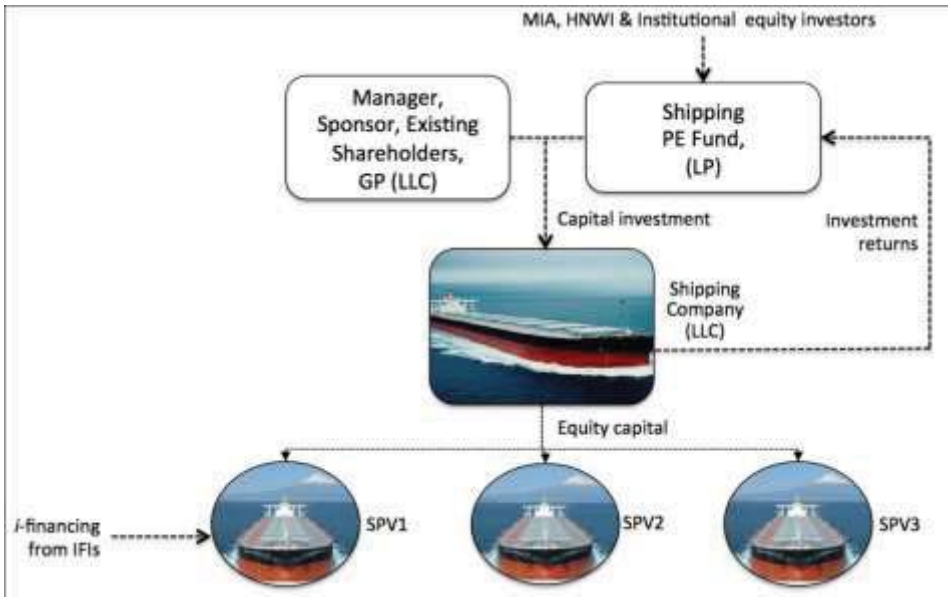
Figure 8. Global Private Equity Investment in Shipping

Specifically, in 2010 Omaha School Employees Retirement Fund invested USD 25 Mn in J.P. Morgan's USD 750 Mn private equity Global Maritime Investment Fund (J.P Morgan, 2010, 2014). In 2011 Ontario Municipal Employees Retirement System (OMERS) concluded a direct acquisition of a shipping services company, V-Group, for USD 520 Mn, and also in 2013 Ontario Teachers Pension Plan (OTPP) concluded a direct

investment in a USD 470 Mn container-leasing acquisition of SeaCube. As one of the largest pension funds in the world, Malaysia's EPF is confronted with domestic liquidity constraints: "Venturing into global markets is part of the EPF's overall risk and return diversification strategy. Our fund size has continuously grown at an average of 10% and 11% annually, outpacing Malaysia's Gross Domestic Product (GDP) annual growth of 4% to 6%. As a result, funds as large as ours are constrained by the domestic market's liquidity making it imperative for the EPF to invest globally" (EPF, 2014, p.28). In reality, EPF is not so much a Malaysian public pension fund, but an international fund manager, whose beneficiaries are primarily Malaysian. By 2015, EPF funds have grown to RM 684.53 Bn and earned a ROI of 7.48% (EPF, 2015, p.55). With its new *Shari'ah* compliant savings fund launched in 2016, EPF and indeed other Malaysian pension and investment institutions, should consider Islamic private equity shipping funds as part of their investment committee's diversified asset allocation parametres.

4. Islamic Private Equity Shipping Fund and Institutional Investment

Given conventional private equity (PE) expectations, investee portfolio companies would be structured involving 50%-70% debt (Stowell, 2013, p.321; Hamzah, 2011, p.26), thus IFIs could also contribute with i-financing of individual SPVs (figure 9) through BBA or *bai' bithaman ajil* (based on *bai' al-'inah*), commodity *murabaha* (*tawarruq*), *murabaha* asset financing, declining co-ownership partnership (*musharakah mutanikisah*) or even financial leases in the form of *ijarah wa iqtina*. However, by emphasizing economic substance over legal form (Majallah, 2001, no.3), all of these products, as practiced by IFIs, are devoid of market risk (Abdullah, 2016). Indeed, structured Islamic leases as reflected in Asian Finance Banks's Safeena shipping fund, which initially posted a net yield of 10.2% p.a. (Tradewinds, 2009). Safeena was a 10-year closed-end fund domiciled in Labuan and was used to acquire a chemical tanker for Berlian Laju Tankers (BLT). As with conventional ship-finance, the lack of embedded market risk ensured that BLT and other shipowners either defaulted or had to re-structure their poorly timed vessel acquisitions, under the weight of their debt obligations in the presence of volatile shipping earnings post financial crisis. The marginal efficiency of capital demonstrates that equity finance and profit-sharing is more efficient than debt finance at the TVM in growing an economy and the normative theory of profit in Islam affirms the necessity to incorporate market risk in Islamic financial transactions (Abdullah, 2016; Abdullah, 2017). The global financial crisis has highlighted precisely this in terms of risk, liquidity and capital considerations.



Source: Adapted from Abu Osman (2009)

Figure 9. Islamic Shipping Fund Structure

Another option would be institutional equity investment by IFI Asset Management divisions as LPs, although it is unlikely that they would consider the role of a GP or LP anchor investor given bank risk, liquidity and capital restrictions. Other than HNWIs, potential *Shari'ah*-compliant equity investors would include institutional investors such as Takaful companies, sovereign wealth funds, endowment funds, as well as public and government pension funds. From a Malaysian perspective, this would include primarily Permodalan Nasional Berhad (PNB), the Malaysian Hajj Fund (Lembaga Tabung Haji, LTH), Khazanah, EPF (KWSP) and KWAP,

some of whom already have experience with shipping. The main shareholder of MISC is Petronas; the Ministry of Finance, through the Development Bank and Global Maritime Ventures (GMV), owns 18% of Malaysian Bulk Carriers (MBC); Perbadanan Nasional Berhad (Pernas) formerly owned PNSL (now owned by Konsortium Logistik Berhad, a DLB-Hicom company); and LTH has a joint venture with Alam Maritim. Since 2015, due to a weaker exchange rate, BNM has restricted large-scale investments to be denominated in RM and multi-currency options are possible in shipping.

5. Islamic Financial Institutions and Investment Account Retail Participation

The Hanafi jurists, such as Sarakhsi, have observed that "*mudharabah* under *mudharabah* is legitimate" (Sidiqqi, 1987, p.59), as do the Malikis and the Shafi'is with the permission of the capital provider (*rabb al-mal*), but the Hanbalis dis-allow any profit to the first *mudharib*, whom they argue is not performing any business activity. However, this ignores important business decisions. Thus, the majority opinion of the jurists should prevail, in particular that of the Hanafis, since in considering important commercial decisions, or indeed whatever business effort is contributed by the second *mudharib*, then it is done so on behalf of the fist *mudharib* (Sidiqqi, 1987, pp.59-62). Accordingly, this ruling has also been applied to the two-tier *mudharabah* structure of IFIs (figure 10).

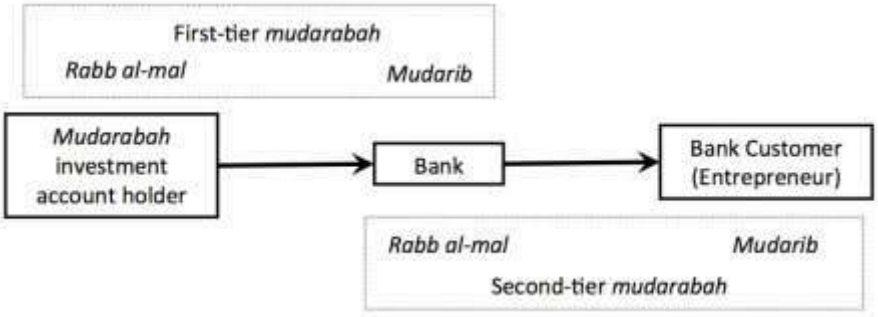


Figure 10. IFI Two-Tier *Mudharabah* Structure

Equally, this two-tier equity transaction could be conducted through the Investment Account Platform (IAP, 2016), which was launched in 2016. The IAP is owned by 6 IFIs and designed to market IFI investment accounts and investee projects. This mechanism is similar to the KG system in Germany and the KS system of Norway, which mobilized a considerable amount of savings for maritime investments and converted these countries into maritime nations. However, the current practice by IFIs is to mobilize investment account holders (IAH) with equity savings from retail investors and given suitable product disclosure, funds would be channeled into projects that have been credit evaluated by the IFIs, and in the case of the IAP, by the Rating Agency of Malaysia (IAP, 2016).

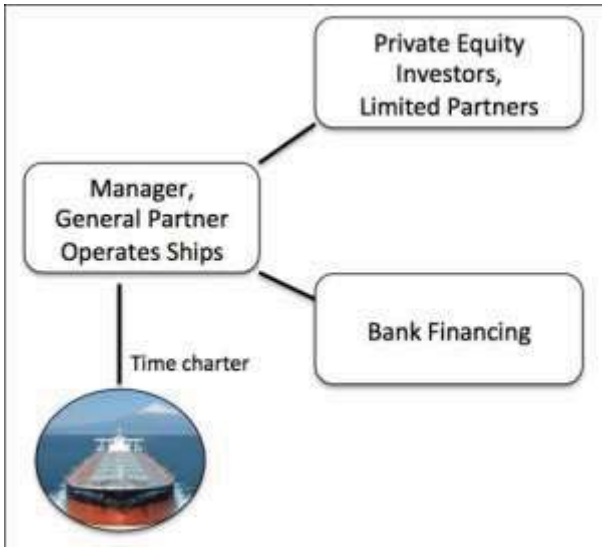
The mechanics of this financial intermediation is that equity capital is mobilized through the IAH via the IFIs, or through the IAP. Investees are then financed by debt transactions at profit rates that reflect the time value of money (TVM): hence, the reason for credit analysis by the IFIs or RAM and not investment analysis, if the investees were finance by equity and profit-sharing. Current ROI are about 4% on the IAH, and the financing returns are about 6% on the investee projects. The banks themselves publish returns on equity (ROE) of at least 10%. The returns on debt from investees cap the returns to the IAH. Clearly, this suggests an unsustainable business model, where the investment expectations of a ROI from the IAH are no less that the ROE of the shareholders in the IFIs, given they are both accepting the same market risk. Furthermore, the marginal efficiency of capital reveals that equity finance on the basis of profit-sharing increases GDP as compared to debt finance at the TVM of money, which is interest. Unless the IFIs and the IAP accept equity in and equity out, they are likely to be displaced, diminished and dis-intermediated, in other words, disrupted by other crowd-funding platforms through technological innovations in financial services (FinTech) as a result of changes in consumer behaviour that involves the least disruption, or the most efficient service at the least cost.

Nonetheless, the two-tier *mudharabah* structure could provide a unique model for IFIs to participate in shipping, since the pass-through benefits of tax-efficient investment, as well as associated risk and returns in international shipping, can be transparently communicated to retail investors. Two successful examples of retail participation in international shipping are the German KG system and the Norwegian KS system, although investments are conducted absent of intermediation and are mobilized through private partnerships. Universal Islamic banks have the advantage of (i) mobilizing funds through retail investment accounts and extending *i*-financing from the

commercial banks, (ii) by managing shipping funds within the asset management divisions, or (iii) by the securitization of maritime assets through asset-backed *sukuk* from their investment bank divisions. Whilst securitization offers long-term financing, in shipping, debt finance from commercial banks is very competitively priced and rating agencies are cautious about rating bonds whose cash-flow ultimately depends on the spot market. Ship-owners prefer flexible financing arrangements, but a weakness in the KS and KG systems, from the investors' perspective, is the lack of regulation, in protecting the investors' interests: this would be quite different from the robust regulation and governance required of IFIs in Malaysia. Given higher capital costs and reduced tax incentives, increased competition emerged to KS and KG systems, as an alternative to raising capital with tax efficient advantages, with the floatation of independent ship-leasing companies (such as Seaspan in 2005). In this case, the lessor obtains tax benefits by depreciating maritime assets against profit and some of the benefit is passed on to the lessee in terms of lower time-charter rental payments under a long-term bare-boat charter. Time-charter rates, operating expenses and interest rates can be fixed thus insulating companies from shipping cycles, such that dividends are typically paid to investors through preference shares. Structured leases, securitization and debt-finance are only successful if the asset has been acquired competitively. In the presence of volatile earnings and leveraged balanced sheets, even the largest owners in the world can represent a counter-party risk (for example, the Korean ship-owner, Hanjin, one of world's largest containership operators, filed for bankruptcy in 2016).

6. Norwegian KS System

In the late 1980s substantial amounts of partnership capital was raised through the Norwegian KS limited partnership structure (figure 11). It is estimated that half of the Norwegian shipping industry operated through KS companies and between 1987-1989 investors committed equity of USD 3.0 Bn (Stopford, 2009, p.306). The KS was established on a single-ship basis with technical management sub-contracted. The KS consists of two more Norwegian or foreign individuals or legal entities, with one general partner (GP) and at least one or more limited liability partners (LLP). The GP must hold at least 10% of the KS. Each LLP must make a capital commitment of at least 40% within 2 years from incorporation, of which 20% is payable upon incorporation. The provision for uncalled capital is left to the partnership agreement and called only if needed (Oldershausen, 2015, p.102). Typically, 80% of the purchase price was financed from a bank loan and the remainder of the purchase price and any working capital would be drawn from cash paid-in from committed equity. Initially the KS system was attractive since for tax purposes the committed capital could be depreciated by 25% on a declining basis although allowable depreciation could not exceed the total capital committed (Stopford, 2009, p.306). However, since the 1990s the tax benefits have been reduced although the speed, flexibility and relatively low cost of structuring a KS partnership, has seen interest revived in recent years. Essentially, the KS can be used as a sale-and-leaseback transaction: a KS special purpose company purchase a vessel from the seller and charters it back to the seller on bareboat charter (Oldershausan, 2015, p.102).

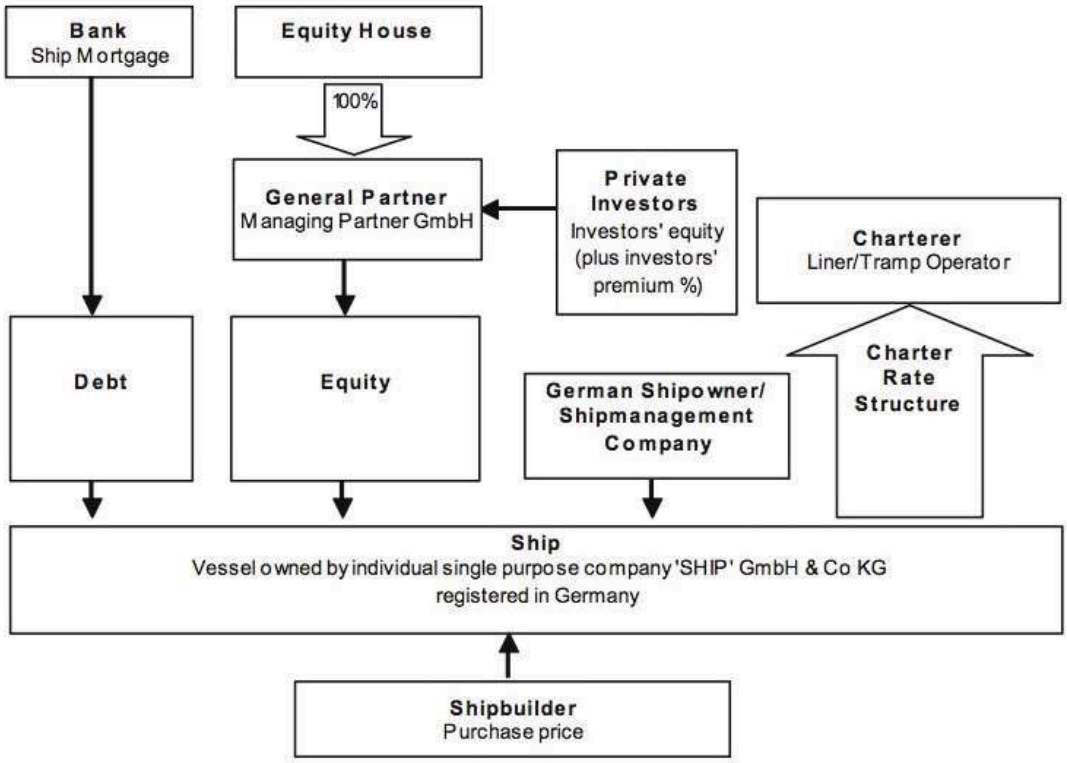


Source: Adapted from Oldershausen (2015, p.106)

Figure 11. KS Shipping Fund Structure

7. German KG System

A form of ship finance that emerged in the mid-1990s, as the equivalent of the Norwegian KS system, was the German registered limited liability partnership, known as the KG shipping fund structure (figure 12). During the 1990s containership companies were generating poor returns and liner operators used KG companies to move vessels off-balance sheet, such that between 1991-2004, liner service operators increased the proportion of chartered-in containerships from 15% to 50% and by 2004 600 vessels have been financed by KGs, which were typically USD 50-100 million in size. German shipyards were regarded as particularly dominant in the containership market segment and were supported by a strong containership brokerage market in Hamburg. Also Germany had a pool of HNWIs facing high marginal rates of income tax. Moreover, German commercial banks were also expanding their loan book and were willing to extend financing to the tax-efficient KG partnership (Stopford, 2009, p.307), thus providing liner companies with off-balance sheet tax-efficient investments for equity investors and lenders. By the late 1990s, legislators reduced the tax-incentives involving accumulated losses and accelerated depreciation to off-set profitable gains in other investments, such that Germany introduced a tonnage tax in line with other European maritime nations. Whilst it deprived investors of reducing their tax bill, it still gave KG investments a unique advantage over other financial and real assets, such as publicly listed stocks, real estate and cash deposits, which we all liable to standard rates of taxation. Also shipping projects were supposed to attract investors for their profitability not for the loss-making capabilities (Johns and Sturm, 2015, pp.75-76).



Source: Clarksons (2008, p.7)

Figure 12. KG Shipping Fund Structure

A KG would typically purchase a vessel from the shipyard, or another ship-owner, and obtain a time-charter. The purchase price is obtained from a bank loan with typically a financing ratio of 50% to 70%, combined with 30% to 50% equity raised from German HNWIs and the general manager. The KG finance system is predicated on the simultaneous benefits it yields to private investors and to ship-owners, which allow KG equity houses to provide a profitable service linking the interested parties. Private investors placing equity in KG shipping funds can receive beneficial taxation treatment since the German tax authorities allow funds invested in shipping to be taxed under the tonnage tax system where the amount of tax paid is based on the size of the vessel, as opposed to a profit-orientated tax. Since tonnage tax is the lesser of the two, KG equity houses opt for tonnage tax treatment (Clarksons, 2008, p.3). The effective tax rate is typically 1% to 3% of the expected income from trading, such that profits from maritime investments under the scheme are often perceived as “tax-free” (Johns and Sturm,

2015, p.76). Ship-owners meanwhile benefit from the fact that a portion of the cost of the ship is borne by private investors, which allows ship-owners to place a greater volume of investments than would otherwise be possible.

Accordingly, by 2007, total investment in German closed end funds was estimated to have reached Euro 12.67 Bn, of which an estimated 30% was in shipping, such that Euro 3.8 Bn of equity was invested in shipping KG funds, which represented a total investment volume in ships of Euro 8.6 Bn. By this time, 64% of KG financing was in containerships, whilst the remaining was increasing diversified into tankers (especially chemical tankers), bulkers and multi-purpose cargo/container vessels. KG financing has proved to be one of the most successful means of financing ship acquisitions in recent years (Clarksons, 2008, p.3).

8. Conclusion

In this paper, we have analyzed the importance of seaborne trade in the context of globalization. We provided an introduction to seaborne trade and have established that 84% of global trade, representing 11,128 million tonnes, is carried by international shipping totaling 1.75 Bn DWT, 87% of which, is carried by the primary shipping segments involving are bulkers (43%), tankers (31%) and containerships (13%), such as capesize bulkers, VLCC tankers and panamax containerships (figure 13). However 75% of ship-finance is financed on a conventional basis. Accordingly, we identified an alternative investment framework for Islamic private equity institutional and for retail investors to participate in international shipping through Islamic financial institutions. Tax-efficient equity finance is not without precedent, given the successful Norwegian KS and German KG structures, but even these involved a significant margin of financing from conventional maritime banks and would only prove successful if assets prices were very low.

Source: Adapted from J. P. Morgan (2010)

Figure 13. The Primary Vessel Segments in Seaborne Trade

Islamic equity finance in international shipping necessarily involves tax-free and debt-free investment in maritime assets. In fact, there is an array of potential target investments (figure 14) including crude oil tankers, products tankers, chemical tankers, bulk-carriers, liquefied natural gas (LNG) carriers, liquefied petroleum gas (LPG) carriers and containerships with their respective homogeneous vessel types within each segment.

Given exceptionally low asset prices, there is currently an enormous investment opportunity available to retail and institutional investors, with the participation of P&I institutions as well as IFIs, to participate in Islamic equity finance and investment in the development of international shipping.

Source: J. P. Morgan (2014)

Figure 14. Target Investments in International Shipping

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The Cases Study of "One Belt and One Road" and "Made in China 2025" Impact on the Development of Taiwan's Machine Tool Industry

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Abstract

The research takes Taiwan's machine tool industry as the research subject, and gains an insight into the possible impacts of "Industry 4.0", "Belt and Road Initiative" as well as "Made in China 2025" on the development of machine tool industry in Taiwan. Lastly, it is hoped that the machine tool makers in Taiwan will be able to develop and grasp market trends in line with their needs and the status quo in order to achieve direct and indirect operational results. Based on the research results, this research will propose conclusions and provide relevant recommendations on specific and substantial business improvement and policy formulation for the machine tool industry, relevant government agencies and academic research.

Keywords: machine tool industry, Industry 4.0, Belt and Road Initiative, Made in China 2025

1. Introduction

At the conclusion of the 19th CPC National Congress, Chinese President Xi Jinping emphasized on deepening the supply-side structural reforms, constructing a modernized economic system, putting the focus of economic development on the real economy, taking the improvement of the supply system quality as the main direction and continuing to focus on the Belt and Road Initiative. Xi Jinping stated that China should promote the formation of a new pattern of full liberalization by focusing on the construction of the Belt and the Road Initiative. In addition, we should stick to the idea of joint emphasis on "bringing in" and "going global", adhere to the principle of co-consulting, co-construction and co-sharing, strengthen the openness and cooperation of innovation capability, and form an open pattern of linkage at home and abroad, and mutual assistance between the East and the West (cnYES, com, 2017). China's Belt and Road Initiative is mainly aimed at establishing a platform for cooperation between China and other countries. It connects the Asia-Pacific Economic Circle to the east and enters the European Economic Circle to the west to speed up the Chinese economic growth and transformation. Besides, with the support of its rising economic strength, China creates a trading and transportation corridor both on sea and land linking the Eurasian Continent (Li, 2017). The Belt and Road Initiative is both the "Silk Road Economic Belt" and the "21st Century Maritime Silk Road.", which is a concept of economic cooperation proposed by Xi Jinping in 2013 and has become China's major economic strategy as the transnational economic belt (Chao and Wu, 2015). From 2013 to 2016, Chinese-invested enterprises have made an investment of about USD 560 billion and provided various taxes of more than USD 100 billion to their host countries as well as created millions of jobs so as to promote the transformation of resources and labor advantages in their host countries into development advantages, which is generally welcomed by the countries where the investment is made (cnYES.com, 2017). The Belt and Road Initiative is not an entity or a mechanism. Rather, it is a concept and initiative of cooperative development that relies on the existing dual-multilateral mechanism between China and other related countries and regions. With the help of an established and effective regional cooperation platform, it is aimed to take over the historical symbol of the "Silk Road" in order to hold high the banner of peaceful development and proactively develop economic partnership with countries and regions along the route to jointly build a community of shared interests, common destiny and responsibility featured by mutual trust, economic integration and cultural tolerance (Chao and Wu, 2015). The Belt and Road Initiative will link the Asia-Pacific Economic Circle and the European Economic Circle in the combination of trade, investment and financial cooperation across the regions of East Asia, South Asia, Middle East, Europe and North Africa, covering more than 40 countries, and will become the most promising economic corridor and

strategic economic zone on the Eurasian continent in the future (Li, 2017). In addition, China adopted the "Made in China 2025" promotion plan on March 25, 2015. It can be said that "Made in China 2025" is the Chinese version of "Industry 4.0" and reveals the future goal of China's stepping into a powerful nation from a manufacturing country as well as represents China's manufacturing development path map. "Made in China 2025" has also become China's first plan spanning two five-years, including the 13th Five-Year Plan (2016 to 2020) and the 14th Five-Year Plan (2021-2025) (STPI, 2015). In addition, the key international industrial layout of "Made in China 2025" will be better integrated into the global division of labor system. China will take the countries along the Belt and Road as the focus of deepening international cooperation in manufacturing, encourage and guide China-based enterprises to invest and prosper in the countries along the route, carry out extensive exchanges with all walks of life both at home and abroad, expand bilateral, multilateral and regional cooperation and support the establishment of local industrial system (STPI, 2015).

With the rapid changes in the international market and the rise of China's red supply chain, the industry in Taiwan is facing severe and complicated competitive environment and manufacturing technology challenges. In addition, the slowdown in GDP growth, the frequent occurrence of labor disputes and labor policy disputes as well as the industrial restructuring are all common important topics. At present, apart from the developing countries that seize the mass production market in which Taiwan has excelled in the past, the leading manufacturers in Europe have started to seize the middle-class market. In response to the international trends such as "Industry 4.0" and "Made in China 2025", Executive Yuan of the Republic of China approved "Productivity 4.0 Development Program" on September 17th. The 10-year plan of "Productivity 4.0 Development Program" will initially give priority to the introduction of Internet of Things, intelligent robots and big data in the 7 major industries, including machine tools, 3C, metal processing, food, medical care, logistics and agriculture (BOST, Republic of China (Taiwan), 2015). In response to the fast-growing Internet of Things (IoT) industry, the world has entered an era of advanced manufacturing competition for smart integration. Among them, "Industry 4.0" is a rather hot topic in the near term. It brings about manufacturing changes that reduce costs and increase efficiency, but also pose many challenges for manufacturers. "Industry 4.0" covers a wide range of industries. With IoT, big data, service network and network security as the four pillars, it promotes the further development of the Industrial Machine Tool Industry, which plays a very important role in the technological base of national industries on the technological base and operating profits level of the overall national development (Liu, 2016). In Taiwan, the machine tool industry is well-established. With the "Productivity 4.0 Development Program" and its continued benefit from the trend of automation, if Taiwan's machine tool industry is integrated effectively with sound standardization and complicated system management, communication infrastructure and network security, it will advance toward "Industry 4.0". Coupled with the development of the global smart phones and smart machines, the future development of machine tool industry in Taiwan will continue to be optimistic. Therefore, this study takes Taiwan's machine tool industry as the research subject, and gains an insight into the possible impacts of "Industry 4.0", "Belt and Road Initiative" as well as "Made in China 2025" on the development of machine tool industry in Taiwan through literature surveys and essays. Lastly, it is hoped that the machine tool makers in Taiwan will be able to develop and grasp market trends in line with their needs and the status quo in order to achieve direct and indirect operational results. Based on the research results, this study will propose conclusions and provide relevant recommendations on specific and substantial business improvement and policy formulation for the machine tool industry, relevant government agencies and academic research.

2. Literature Review

In recent years, the cooperation among China's enterprises (Chinese Enterprises) in "going global" has shown rapid growth and Chinese manufacturing industry has ranked the first in the world in scale. The 13th Five-Year Plan shows that China will achieve a higher level of opening-up on the basis of its original opening up, and speed up its transformation and upgrading in an all-round way. Its core transformation will shift from "Made in China" to "Created in China". The concept, planning policies and overall strategic vision of the "Belt and Road Initiative" are important strategies in the 13th Five-Year Plan. The major contents include the response to the new round of China's reform and opening up and the balancing of regional development. Its strategy can be important engines to expand the opening up of the Midwest regions and development of the Midwest. Besides, it can consume the excess production capacity. Especially, supported by the huge financial support of the Asia Infrastructure Investment Bank (AIIB), the "Belt and Road Initiative" will further promote the Asia-Europe regional linkage and affect the existing cross-strait economic, trade and investment relations as well as impact on the external development of Taiwan's enterprises (Chao et al., 2016). The "Belt and Road" is not an entity or a mechanism. Rather, it is a concept and initiative of cooperative development that depends on the existing

dual-multilateral mechanism between China and other countries and regions. With the existing and effective platform for regional cooperation, the "Belt and Road Initiative" spans across Asia, Africa and Africa, and covers 26 countries and regions along the route with an estimated 4.4 billion population, which accounts for about 63% of the global total population. Most of the countries along the "Belt and Road Initiative" are developing countries and emerging economies with vast market space and considerable infrastructure construction scale, requiring an annual investment of USD 1,000 billion and a total trade volume of at least USD 100 million-USD 200 million along the route. Therefore, the countries have become an eye-catching target for investment in various countries and also an incentive for AIIB to attract more than 50 countries to participate in advance (Chao and Wu, 2015; Wen and Wang, 2015). The framework of the "Belt and Road Initiative" is clear. The two lines are spreading and the cooperation focuses on the basis of policy communication, facilities, connectivity, trade flow and financial facilities. The Midwest China is the biggest maneuver zone in the Chinese economic development. It expands its land rights westward and its support to seaward and maritime transportation lines to the east. The balanced development of land and sea rights under the "Belt and Road Initiative" is the general direction for China to walk toward the international economic development (Chao and Wu, 2015; Wen and Wang, 2015).

All the top 10 key areas proposed by "Made in China 2025" are high-tech and strategic industries, and are also the focus of future industrial policy support in China, including (1) the new generation of information technology industries, (2) high-end CNC machine tools and robots, (3) aerospace and aviation equipment, (4) marine engineering equipment and high-tech vessels, (5) advanced rail transit equipment, (6) energy-saving and new energy vehicles, (7) electrical equipment, (8) agricultural machinery (9) new materials and (10) biomedical and high performance medical devices (STPI, 2015). Therefore, "Made in China 2025" will bring about industrial upgrading opportunities in the first place, and China will vigorously develop advanced manufacturing industries and promote the growth of new industries and new forms of business such as producer services so as to push the industry toward the middle and high end. In addition, China has guided the industrial restructuring with policies and exported the excess domestic production capacity and labor through the outward expansion of infrastructure. In the meantime, it has coordinated the activities of promoting "AIIB" and "Silk Road Fund" as well as other means. In the past, China used labor-intensive industries with export-oriented production models to win output in the global production chain. With the global demand for exported products declining, "slow growth" is the "new normal" for China's economic development. As a result, China has gradually shifted the focus of its industrial policies toward an "investment-oriented" industry that focuses on optimization of production technologies as well as product and service innovation to guide the industrial transformation (Li, 2017).

In recent years, China has promoted "high-speed railway diplomacy" all over the world and built high-speed railways by means of investment or cooperation in Russia, the United Kingdom, Hungary, Serbia, Romania, Turkey, Venezuela, the United States, Thailand and Indonesia, etc. China is ambitious to propose five global high-speed rail plans and hopes to extend the high-speed rail to Eurasia, North America, Central Asia and all regions in Southeast Asia with China as the center (Li, 2017). The interconnection of infrastructure is a priority area for the "Belt and Road Initiative". On the basis of respecting the sovereignty and security concerns of the countries concerned, the CPC proposed that the countries along the route should strengthen the docking of infrastructure construction plans and technical standards, and jointly push forward the construction of international backbone corridors, which gradually forms an infrastructure network connecting Asian subregions and Asia, Europe and Africa. The Asian Development Bank has made estimates that investment in infrastructure construction in the Asia Pacific Region needs USD 8,000 billion for the 10-year period between 2010 and 2020, while ADB loans for infrastructure projects are only USD 100 billion per annum. One of the purposes of establishing the AIIB is to attract global funding to fill that gap (Li, 2017).

Under the intelligent development trend of global manufacturing industry, Germany vigorously promoted the "Industry 4.0 Initiative", the United States proposed the "Advanced Manufacturing Partner Program" (AMP) in 2011, Japan promoted the "Industry 4.1J" in 2015, and South Korea promoted the "Advanced Technology National Plan (Manufacturing Innovation 3.0)" in 2014 (Lin, 2015). China put forward specific policies in the 12th Five-Year Plan (2011-2015) drawn up in 2011 and the 13th Five-Year Plan (2016-2020) drawn up in 2015. The most important of these are the "Belt and Road Initiative" and "Made in China 2025". In response to this international trend, Executive Yuan of the Republic of China approved the "Productivity 4.0 Development Program" on September 17th, 2015 as the backbone of the next phase of technological development, focusing on manufacturing, services and agriculture in the expectation of enabling the industry to create new momentum for industrial growth through digital, virtual and networking intelligent production system. In the manufacturing industry, the precision machinery and ICT technologies that Taiwan is good at are combined to promote

high-value domestic sales and create high-end exports to connect global markets and enhance the international competitiveness of the industry as a whole, thus achieving the goal of "expanding domestic market demand and creating export opportunities". In addition, the Ministry of Economic Affairs Bureau of Industry sets up the Productivity 4.0 Promotion Office based on the intelligent automation and applies the Internet of Things, intelligent robots, and huge amounts of data and other technologies, as well as production management to guide the domestic industrial restructuring and promote the networking service manufacturing system of intelligent manufacturing and intelligent service in order to reach the vision and goal of Productivity 4.0, and to declare the promotion of Taiwan's manufacturing industry as a paradigm of high-quality productive forces in the Asia Pacific Region and gradually increase the per capita gross domestic product of the manufacturing industry. "Industry 4.0" in Germany is dominated by the Cyber-Physical System (CPS). The United States emphasizes the value-added services of ICT, and Taiwan combines both the advantages and promote the Productivity 4.0 through lean management. It utilizes such technologies as CPS, Internet of Things, smart machinery/robots, huge data and precision management to enhance the added value and productivity of the industry by applying such value-added manufacturing as electronic information, metal transport equipment, machinery and equipment, textile and foodstuffs in order to create a comprehensive system integration solution and look forward to creating the next wave of overall industry momentum (Ministry of Economic Affairs' Productivity 4.0 Office, Republic of China (Taiwan), 2016).

Known as the "mother of machinery," machine tool is an important basis for the development of national industries, and Taiwan occupies an important position in the world machine tool industry. The machine tool industry is an export-oriented industry. In recent years, the machine tool industry in Taiwan has been developing rapidly. After Taiwan's machine tool industry output exceeded NTD 100 billion in 2005, it ranks among the best in both the exporting and manufacturing countries in the world for machine tools and has become the focus of Taiwan Industry, and even shoulders the key role of supporting the development of Taiwan's industry. A very high portion of Taiwan machine tool manufacturers is based in the central Taiwan area. In the machine tool industry supply chain, SME-based machine tools and their third-parties form the industrial settlement for labor division and cooperation production network. The interdependent social relations among manufacturers embedded in this cluster of industries allow the cooperation among manufacturers to adapt to various forms of cooperation quickly and flexibly in response to changes in the market and utilize all the available resources in the system to engage in every aspect of R&D, design, trial production, production, assembly and sales in order to further enhance the added value associated with the products in the process (Liu, 1999). HIWIN Technologies, Tongtai Machine & Tool, Chin Fong Machine, Good Way, Airtac, Yeong Chin Machinery, AWEA, TAKISAWA Technology, and Shieh Yih Machinery and other quality machine tool manufacturers have built a complete Zhongwei system that can respond to various industrial needs, make flexible adjustments and enhance the capacity of customized services. The close integration of all aspects of the Taiwan machinery industry supply chain with the geographical location, coupled with the perfect peripheral R&D institutions, tertiary institutions and industrial zones, has developed a mechanical design industry R&D culture with a sound satellite system architecture and greatly enhanced the Taiwan production efficiency of the machine tool industry, which is exactly the advantage of Taiwan machine tool industry in Taiwan.

In response to China's "Belt and Road Initiative" and "Made in China 2025", the global economic and trade activities will surely change. Taiwan should make use of its potential and strength to take part in the grand construction and economic, trading, scientific and technological cooperation for development in Europe, Asia and Africa (Wen and Wang 2015). Taiwan's enterprises with technological capabilities in the industry can derive opportunities arising from the promotion of infrastructures by participating in the "Belt and Road Initiative" and "Made in China 2025" (Chao et al., 2016). China is both the biggest machinery exportation market for Taiwan and the largest machinery consumer market across the world. According to the latest statistics released by IEK at the end of 2016 (2016), the global machine tool market was USD 71.22 billion in 2016 due to the sluggish growth of the world's major economies and the decrease in market demand. Compared with 2015, it declined by 10.9%. Taiwan's machinery industry has also showed a decline of 6.4% from 2015, with a total output value of about NTD 904.5 billion. The total output value of metalworking machine tools in major sub-industries was NTD 117.3 billion (Chen, 2017). Expanding the "Belt and Road Initiative" policy for development of national railways, highways and related infrastructure construction along the routes is expected to drive the demand for various machinery. The "Made in China 2025" strategy is based on the principle of "innovation driven, quality first, green development, structural optimization, and human resources oriented" to promote the development of sophisticated CNC machine tools and robots and other sophisticated equipment. It will also help the industrial transformation and upgrading. At present, the dependence of manufacturing industry on key core technologies and high-end equipment is still high. If Taiwan manufacturers can grasp the opportunities and automation trends

of China's current policy-related machinery procurement, it will be an important key for cultivating the Chinese market. The key technologies and industrial layout of Taiwanese enterprises are still attractive to China.

3. Research and Analysis

The "Belt and Road Initiative" will drive the process of industrialization along the country's borders and enhance investment and cooperation in various manufacturing industries. With the "Belt and Road Initiative" and "Made in China 2025", China will actively encourage and support the equipment manufacturing industry chain to "go global" to invest and start businesses in these countries, and promote the upgrading of local industries and increase employment. In recent years, due to the adjustment of economic structure and policy in China, the GDP growth rate has slightly declined. In particular, China's overcapacity that causes oversupply is regarded as the main cause of China's economic downturn in recent years. Therefore, how to solve the problem of overcapacity has become a top priority. For instance, in the case of the economic downturn, the production of raw materials will naturally be subject to an oversupply phenomenon, which can only be solved by adjusting production capacity. However, local governments in China are reluctant to let local enterprises cut production in order to protect their own tax revenue and employment performance so as not to affect their own political future. As a result, market demand is declining, but businesses continue to produce, which results in a decrease in revenue and the need to recognize large sums of bad debts. This in turn affects the bank's willingness to lend. When corporate bad debts increase, the regulations require banks to increase their mortgages or withdraw loans, which in turn will create a crisis in business closures and affect the willingness to invest (Li, 2017). Therefore, China hopes that by promoting the policy of the "Belt and Road Initiative", export to emerging industrial countries such as Southeast Asia may be increased in order to resolve its surplus machine tool capacity and inventory. In order to improve its industrial structure and address the serious unbalance between the supply and demand of some raw materials and industrial products, China will continue to carry out the "supply-side reform", which will not only limit the growth momentum of the machinery and equipment needed for its manufacturing imports, but also impact the import volume from Taiwan of machinery and equipment (Chen, 2017). Therefore, Taiwan's machinery industry must adopt such smart machinery applications to meet the current trend of global manufacturing development. Others include: standalone equipment and production lines with machine-to-machine communication (M2M), Internet of Things (IoT), standalone equipment and production lines with remote monitoring capabilities, or equipment and components with predictive maintenance capability in order to establish a digital enterprise and supply chain; reconstruct the national and regional manufacturing systems through intelligent machine-based human-interface the standalone equipment and production lines as well as smart robots; improve staff productivity and value through a standalone equipment and production lines with data analysis and decision support capabilities as well as smart robots (Chen, 2017). The study by Raffa and Zollo (1994) pointed out that when an enterprise did not sustain innovation and change, its competitiveness and economic profitability would show a decline. Tomala and Senechal (2004) also believed that in order to maintain the competitiveness of a company, it was necessary to strengthen the company's ability to innovate. The machine tools produced by Taiwanese manufacturers are high-end CNC machines and precision equipment. It is a product project that China actively encourages for assisting the industrial restructuring and upgrading. The prospects for developing medium-end and high-end models in the Chinese market are quite promising. With the emergence of a new generation of Internet technologies such as artificial intelligence and big data, as well as other new technologies, the manufacturing industry needs to be transformed from traditional manufacturing to smart manufacturing, including the transformation to green manufacturing and service manufacturing, which is very important for productivity. The development of high-end equipment manufacturing industry is not only an important driving force to promote industrial restructuring and upgrading, but also determines the overall competitiveness of the equipment manufacturing industry chain.

As a national hub industry, the machine tool industry drives the performance of manufacturing in terms of production efficiency and product accuracy. Therefore, the machine tool industry is regarded as an indicator of the national industrialization level. In recent years, the demand market for machine tools has been continuously developed, such as steam locomotives, home appliances, molds, aerospace and 3C industries, as well as recently emerging bio-medical, green energy and space industries. Among them, the core technology research has surpassed the early field dominated by institutions and electronic control. ICT technology, optical laser, image processing, remote wireless monitoring, and even cloud computing, etc., have been integrated into the technical application category of machine tools (Liu, 2016). Taiwan's manufacturing industry constantly learns from the imitations to enhance its management capability and technical level by virtue of its flexible and flexible features. Coupled with its niche advantages in production, marketing and other professional fields, the manufacturing industry in Taiwan adapts to the changes in the market demand well due to its relatively small size and responds

to changes in the economic climate with a high degree of flexibility (Wu, 2008). In order to improve the competitiveness of Taiwan's machinery industry, Executive Yuan of the Republic of China passed the "Smart Machinery Industry Promotion Program" in 2016. It is expected to build the construction energy for intelligent machinery and smart production lines based on the existing precision machinery industry and combining with a series of intelligent tech elements, including robots, Internet of Things, huge data, CPS, 3D printing and sensors, which can be called "Taiwan's starting year of intelligent machinery". Taiwan's machinery industry will be able to obtain higher value from smart standalone equipment, automated and intelligent production lines as well as the overall manufacturing of energy solutions. The aerospace and semiconductor industries will be selected as the main application fields for developing intelligent machine tools and high-tech production equipment (Chen, 2017). The development of Taiwan's machine tools is mainly conducted in central Taiwan due to the regional demand. However, the machine tool cluster in Taichung is the largest machine tool industrial cluster in the world at present, and it is quite necessary to expand the operational scale of Taiwan's industries, cultivate the professional technical personnel and explore the emerging markets in order to continue to maintain their unique industries in Taiwan (Tsai, 2010). The current global machine tool market is optimistic about the needs of emerging industries or countries with industrial restructuring. Therefore, Taiwan should gain a firm footing in the new century by using the global layout and the China market as well as the "Belt and Road Initiative" to build Taiwan's international status and brand in key and crucial industries (Wen and Wang, 2015). The intelligent machine is the key to "Industry 4.0/Intelligent Manufacturing". The system architecture includes a machine base, a sensor or a sensing module, a data storage, a computing and control module, and a communication module, which can be respectively used in manufacturing and personal/home/business areas. The system can use the sensor to perceive the surrounding environment in the face of unknown and changing environment, accomplish special tasks through various control models and automatically adjust the reaction of the machine itself (Chen, 2017). The infrastructure related to the "Belt and Road Initiative" will combine concepts such as IoT, smart city, smart grid, smart transportation and smart home in the future, and select specific cities in both sides as IoT and smart city test and demonstration applications in order to explore smart medical treatment care, environmental protection, smart grid and smart transportation, thus forming solutions to further develop the global market (Wen and Wang, 2015)

4. Results and Discussion

In conclusion, massive machine tool industry is needed to support "Industry 4.0". However, with the saturation of Taiwan's domestic demand market in recent years, the rise of China's manufacturing industry and the shrinking of domestic exports have greatly affected the country's economic development. Therefore, how to effectively upgrade Taiwan's manufacturing industry is an urgent issue. Chang (2015) pointed out that the process from the proposal of German Industry 4.0 in 2011 to its finalization in 2013 mainly integrated all kinds of industry-related technologies with various related experiences and established a complete Smart Factory. In addition, the various partnerships were linked and integrated for the improvement of overall German manufacturing industry in the aspects of computer, digital, intelligent and other aspects. Thus, it can be seen that if companies get rid of the previous traditional manufacturing model, and transform new forms of industry, more elements of design innovation are needed. Taiwan is strategically located in the center of the first island chain. If Xiamen, Quanzhou, Pingtan, Fuzhou, Taiwan, Kaohsiung, and Taichung can be connected, and the undersea tunnels among Fujian, Kinmen and Taiwan can be built, the one-day high speed railway life circle of China and Taiwan will be established to form an economic, trading, cultural and tourism economic belt by connecting the "Trans-Asian Railway" and the "Asia-Europe Land Bridge". Thus, it will further enable the "Belt and Road Initiative" to break through the first island chain eastwards and develop toward the western Pacific (Wen and Wang, 2015).

Taiwan's machine tool industry has a leading position, and its product sophistication, customization and R&D innovation ability occupy a place in the international market competition. The development of the machinery industry across the Taiwan Strait has its own advantages and strong cooperation complementarity for transformation and upgrading. Brand building and international market expansion should be the common direction for both sides to work together. In the future, Taiwan should actively promote the upgrading of industrial policies and regulations with the goal of helping the Taiwan-funded enterprises to enhance their international competitiveness on the positive side and safeguarding Taiwan's public funds and industrial technologies; the negative effect is to try to avoid the obsolete laws and regulations and the logic of industrial development from becoming a stumbling block to industrial innovation and investment (Lin, 2015). Taiwan's participation in the "Belt and Road Initiative" is an important practice of cross-strait economic, trade, science and technology cooperation and economic integration in the Asia Pacific Region. Whether the two sides of the

Strait will create substantive interests of "Belt and Road, Opening of Both Sides" through substantive and cooperative relations will determine the evaluation of dividends for cross-strait relations. In this regard, the authorities on both sides of the Strait should, apart from acting in a pragmatic manner, deal with cross-strait economic, trading, scientific and technological cooperation programs and road maps in a concerted manner and sincerely communicate with each other. For the Belt and Road Initiative, cross-strait industries may struggle against each other in the global market. The possible vicious competition of technologies and talents also requires both parties to face themselves openly and make every effort to find a reasonable solution (Wen and Wang, 2015). In the implementation of "Made in China 2025", China vigorously promotes the in-depth integration of information technology and manufacturing technology, and focuses on intelligent manufacturing to speed up the transformation and upgrading of the manufacturing industry. While catching up with the rapid economic development in China and integrating into the Chinese market, and jointly promoting technological innovation as well as industrial restructuring and upgrading, Taiwan businessmen should seize the opportunity and join hands in building the "Belt and Road Initiative" to jointly expand the international market.

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Empirical Evidence on the Value Relevance of Brand Values across Countries

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Abstract

Stock prices reflect firms-related information differently depending on the environmental and institutional context. However, previous empirical studies test mainly accounting data. Since intangible assets became a crucial element for business success and brands are considered critical for value creation, correlated disclosure is proven to be value relevant for investors. The majority of accounting standards do not allow to recognize internally generated intangible assets in the balance sheet and therefore more and more practitioners, both investors and analysts, use brand values provided by third independent parties, such as consulting firms. The purpose of this paper is to investigate whether and how brand-related information differs across countries testing the value relevance of brand values published in Brand Finance's Reports. This study aims to open a new stream of literature regarding the value relevance of non-accounting information across countries.

Keywords: brand valuation, cross-country, intangible assets, stock markets, value relevance

1. Introduction

Intangible assets represent one of determinants of firm value. In particular, companies pay more attention to the promotion of their brands since they consider them as a crucial asset for value creation (Madden, Fehle & Fournier, 2006) and as drivers of abnormal earnings creation (Beretta Zanoni & Vernizzi, 2014). The importance of brands is also recognized by investors and financial analysts, which take into consideration brand values in their decision making-process. Empirical studies find a positive relationship between the value of these intangibles and firms' financial performance (Kerin & Sethuraman, 1998). Brands can be also evaluated for other purposes, such as to take advantage of fiscal benefits or in the context of the firms' acquisitions to apply the purchase price allocation. However, the lack of guidelines and best practices often pushes practitioners to use values provided by consulting firms. Literature proves that brand values estimated and published by third independent parties are reflected on stock prices and returns (Barth, Clement, Foster & Kasznik, 1998). The results reveal that non-accounting values provided by consulting firms (e.g. Interbrand, Brand Finance and BrandZ) are relevant to equity valuation of companies (Bagna, Dicuonzo, Perrone & Dell'Atti, 2017). This is due to two main reasons: (1) the significant role brands take on in firm valuation (Barth & Clinch, 1998) and (2) the denial by many accounting standards to recognize internally built intangible assets, as most of the brands are. Therefore, investors and practitioners use reports published by consulting firms to fulfil the need of brand-related information. Although the positive association between brand values and stock prices has been demonstrated, it is unquestionable that it could differ across countries. To improve the efficiency of financial markets and optimize the capital allocation, it is beneficial to know if and how information (both accounting and non-accounting) are reflected into stock prices in each market; namely, if an information is value relevant in a given financial market. While the different value relevance of accounting data across countries has been widely investigated, no study provides empirical evidence about this critical issue regarding brand values.

The aim of this study is to contribute to filling this research gap investigating whether and how the value relevance of brand values estimated by consulting firms differs across countries. The empirical analysis is based on a sample of 2,518 brand values, hand-collected from reports published by Brand Finance in the period 2008-2015, referable to 17 different countries. Through the use of traditional value relevance regression analysis, we expect to find a different significance of brand values coefficients in each market. Our hypothesis is that, given the presence of country-specific factors, brand values are differently reflected into stock prices.

This paper presents both theoretical and practical contributions. It extends prior literature on capital market research providing empirical evidence on the different informative content of non-accounting data. Also, the results could help investors in their decision-making process, providing more tools to analyze the ability of stock prices to capture non-accounting information in different institutional context in order to make capital allocation more efficiently. However, this research represents a first step, which needs to be followed by the recognition of country-specific factors that produce the identified divergence.

The remainder of this paper is structured as follows. Section 2 presents a review of previous empirical studies and the hypothesis development. Section 3 describes the research method and the data used, while section 4 discusses results. Finally, section 5 details the conclusions and the limitations which affect the current study.

2. Literature Review & Hypothesis Development

Prior literature provides many proofs of the value relevance of brand values. Barth et al. (1998) show that brand values provided by Financial World from 1991 to 1996 are reflected into stock prices and returns. Also, Barth and Clinch (1998) demonstrate that intangible assets of a sample of Australian firms are value relevant and identify brands as a relevant portion of them. Aaker and Jacobson (2001) find out the informative content of brand attitude, defined as a component of brand equity, and that its change influences financial performance. Kallapur and Kwan (2004) show that the first recognition of brands in a sample of UK firms has an impact on stock prices. They highlight this influence in the first 21 days after announcement by management, even if managers tend to overestimate brand values. Mizik and Jacobson (2008) identify relevance and energy as Y&R Brand Asset Valuator's metrics which explain the informative content of brands. Examining the industry effect, Kirk, Ray and Wilson (2013) reveal that the association between brand values and stock prices depends on firm type. They find that this relationship is significant for consumers firms but not significant for industrial firms. Analyzing reports published by different consulting firms, Bagna et al. (2017) identify Brand Finance values as the most value relevant, compared to Interbrand and BrandZ values, due to the different evaluation methods used by each provider.

Although evidence reveals a positive association between brand values and stock prices, a central issue is to understand whether this relationship differs across countries. Alford, Jones, Leftwich and Zmijewski (1993) analyze the difference in information content and timeliness of accounting earnings in 17 different countries due to the different accounting systems, using USA as benchmark. Results show a higher value relevance and timeliness for accounting earnings reported using local-GAAP in Australia, France, Netherlands and UK, compared to US firms adopting related accounting standards (i.e. US-GAAP); other countries' local-GAAP (e.g. Italian, Danish, Swedish and Singaporean) produce a lower value relevance and timeliness for accounting earnings then US firms. For other countries, findings are uncertain. Ali and Hwang (2000) test how four measures of value relevance of accounting data differ across countries, using a sample of US firms as benchmark. Arce and Mora (2002) pay attention to the accounting differences among European countries and how these have impact on the valuation of earnings and book value. Although results are not univocal, the authors conclude that the different accounting systems differently affect the information content of earnings and book value in European countries. Hellström (2006) studies the case of the value relevance in a transitional economy (i.e. Czech Republic), comparing it to a developed economy (i.e. Sweden). Using observation from both countries in the years from 1994 to 2001, the author identifies an improvement in the informative content of accounting variables. The results obtained by the regression analysis are confirmed by the author using the hedge portfolio methodology. Brown, He and Teitel (2006) test the association between the value relevance of earnings and conditional conservatism, using a sample of 20 different countries which differ for the level of accrual intensity. Findings show that "artifacts of legal environments that reduce managers' opportunistic behavior" such as conditional conservatism and shareholders' protection are complementary and have a positive effect on the value relevance of reported earnings. Finally, Camodeca, Almici and Renzi Brivio (2014) show that accounting data are differently reflected in stock prices in Italy and United Kingdom. The evidence reveals a higher value relevance in the Italian market, and in particular a different information content of NIBEI (Net Income Before Extraordinary Items) and OCF (Operating Cash Flows) in the two markets.

In summary, the literature provides strong evidence that accounting information is reflected into stock markets differently across countries due to diverse institutional context and environmental characteristics. However, no study investigates this cross-country difference in the value relevance of non-accounting data.

The purpose of this study is to verify whether the association between brand values provided by independent third parties and stock prices differs across country. On the one hand, previous works demonstrate that brand values published by consulting firms are taken into consideration by investors and therefore they are reflected in

the stock prices (Barth et al., 1998; Bagna et al., 2017). On the other hand, other empirical analyses reveal that the value relevance of accounting data differs across countries due to environmental characteristics and institutional context (Ali & Hwang, 2000; Arce & Mora, 2002; Hellström, 2005).

Moving from these two streams of literature, we formulate the following hypothesis:

HP: *The value relevance of brand values provided by independent third parties differs across countries.*

3. Research Method

In order to investigate whether accounting variables are reflected into stock prices, previous studies use Ohlson's model (1995). Following this model, the authors regress market value on book value and net income over the sample. To verify our hypothesis we run a traditional value relevance regression analysis, considering brand values as "other information content". This approach has been firstly adopted by Barth et al. (1998) to test the informative content of brand values. Since we carry out a cross country analysis, we run a separate regression for each country to obtain the beta coefficients of brand values. The model is set up as follow:

$$MV_{i,j} = \alpha + \beta_{BV} BV_{i,j} + \beta_{NI} NI_{i,j} + \beta_{Brand} Brand_{i,j} + \beta_{year} YEAR_i + \beta_{ind} INDUSTRY_j \quad (1)$$

where *MV* is the market value of each *j*-firm *i*-year observation; *BV* is the common equity at the end of each year; *NI* is the net income of each *j*-firm *i*-year observation; *Brand* is the brand value provided by Brand Finance. All the variables are scaled to *j*-firm's number of outstanding shares (Mechelli & Cimini, 2016) at the end of each *i*-year, since share-deflated models have been proven to better perform in terms of precision in presence of scale effects (Barth & Clinch, 2009). We also control for *Year* and *Industry*. The statistical significance of each coefficient means that the corresponding variable is positively (or negatively) reflected into stock prices. We hypothesize that the significance of β_{Brand} is different for each market, meaning that brand values have a different relevance in each country.

We consider brand values published in Brand Finance's reports since this consulting firm provides more value relevant brand values then the others (Bagna et al., 2017). The main reason could be the use by Brand Finance of comparable transactions (i.e. license agreements) to estimate the royalty rates, which gives this method a higher objectivity being it a market-income methodology (Rubio, Manuel & Pérez-Hernàndez, 2016).

To estimate brand values published in annual reports Brand Finance employs the following formula:

$$Brand\ Value = \sum_{t=1}^{T} \frac{RR \times Sales_t \times (1-tc)}{(1+DiscountRateBrand)^t} + \frac{RR \times Sales_{T+1}}{DiscountRateBrand - g} \times \frac{1}{(1+DiscountRateBrand)^T} \quad (2)$$

where $Sales_t$ is the firm's sales, *RR* is the royalty rate obtained from comparable license agreements, *tc* is the tax rate, *DiscountRateBrand* is the opportunity cost of the brand and *g* is the growth rate.

As shown in the above formula, Brand Finance uses the royalty relief (or relief from royalties) method, which implies that the value of an asset is given by the royalties a company should pay to detain the asset, discounted at a specific cost of capital. This method is adopted for the following reasons:

- royalty rates are obtained from comparable transactions, bringing to a more objective brand value;

- courts and tax authorities sustain the use of this method since royalty rates are documented by third parties' transactions;

- it is compliant with International Valuation Standards Authority and ISO 10668;

- it can be put in practice using public available information.

As a previous work proves that Brand Finance values are built not using market parameters we do not test for endogeneity in the regression (Bagna et al., 2017). Consequently, the statistical correlation is not caused by simultaneous bias.

3.1 Sample Composition

The sample consists in brand values provided by Brand Finance and published in annual reports from 2008 to 2015 (for a specification of the reports considered, see Appendix). Values for 920 brands have been collected (4,999 observations). Different brands detained by the same firm are treated as a unique brand and their values are summed for each year, reducing the observations to 2,672. Firstly, we drop brands which have been acquired

by other companies during the time frame (2008-2015). At the stage, we count 37 different countries from all over the world. Since we regress market values over fundamentals such as net income and book value, firms with missing accounting data are excluded. Observations are then clustered depending on the country of each firm. Each country is treated as different sample and therefore sub-samples with less than 30 observations are eliminated. Overall, the final sample consists in 2,518 observations from 17 different countries (see Table 1). The sample counts 593 firms, operating in 10 different industries, which detain a total of 813 brands.

Table 1. Observations per year

Year	Obs.
2008	358
2009	378
2010	377
2011	369
2012	384
2013	273
2014	278
2015	101
Total	**2,518**

The number of observations by year (Table 1) is constant for the first 5 years (2008-2012) but they decrease starting from 2013.This reduction is connected with the birth of new high-value brands based in countries, especially Asian, for which we do not have at least 30 observations and therefore they were excluded from our sample.

Table 2 contains the descriptive statistics of the variables of the model proposed. Market value is in mean $ 66.24, ranging from $ 0.51 to $ 1,199.66 and revealing a high variability among companies. Common equity (per share) counts on average $ 40.23, whereas net income (per share) assumes a mean value of $ 5.40. Finally, the range of brand value per share varies from $ 0.09 to $ 319.41 with a mean of $ 15.90.

Table 2. Descriptive Statistics (per share values)

	Minimum	Maximum	Sum	Mean	Std. Deviation
Market Value	$0.51	$1,199.66	$166, 799.19	$66.24	$149.66
Common Equity	$-1.47	$1,001.58	$101, 308.12	$40.23	$118.34
Net Income	$-6.95	$145.65	$13, 596.44	$5.40	$17.38
Brand Value	$0.09	$319.41	$40, 034.35	$15.90	$39.03

As shown in the following tables, the biggest sub-sample is USA, which includes 978 observations, followed by Japan and France, while the smallest one is Italy with only 32 observations (Table 3).

Regarding industry composition of our sample (Table 3), we count 10 different industries. More than 22% of the observations are referred to financial firms. Consumers goods, consumer services and industrial firms represent respectively 19%, 18% and 11% of our sample, whereas companies belonging to basic material, healthcare, oil & gas and utilities sectors count comprehensively only 14% of the total observations.

In terms of values per share or total values, the biggest sub-sample is still USA (Table 4 and Table 5).

Table 3. Industries per country

Country	Basic Materials	Consumer Goods	Consumer Services	Financial	Health Care	Industrials	Oil & Gas	Technology	Telecom	Utilities	Total
Australia	3	0	11	30	0	0	0	0	8	0	**52**
Brazil	4	2	2	15	0	0	5	0	6	1	**35**
Canada	0	0	4	46	0	8	0	7	14	0	**79**
China	1	22	18	67	0	12	15	13	22	0	**170**
France	0	53	40	31	3	25	8	7	8	15	**190**
Germany	8	58	17	27	3	21	0	7	2	13	**156**
India	0	0	0	9	0	9	11	15	4	0	**48**
Italy	0	10	0	8	0	0	4	0	5	5	**32**
Japan	5	115	32	31	3	48	1	32	27	16	**310**
Korea	4	16	2	10	0	0	0	2	7	5	**46**
Netherlands	5	10	1	15	7	4	8	0	3	0	**53**
Russia	1	0	6	7	0	0	14	0	6	0	**34**
Spain	0	0	8	20	0	8	0	0	7	11	**54**
Sweden	0	1	8	8	0	10	0	7	5	0	**39**
Switzerland	1	15	0	28	7	16	0	0	5	0	**72**
UK	6	19	49	52	5	4	8	0	16	11	**170**
USA	8	154	267	169	66	123	30	123	21	17	**978**
Total	**46**	**475**	**465**	**573**	**94**	**288**	**104**	**213**	**166**	**94**	**2518**

Table 4. Descriptive statistics at country level (per share values)

Country	MV	Common Equity	Net Income	Brand Value
	Mean	Mean	Mean	Mean
Australia	$26.78	$18.91	$2.43	$2.56
Brazil	$17.46	$21.40	$2.79	$8.93
Canada	$44.70	$23.48	$3.44	$6.44
China	$9.08	$4.07	$0.68	$2.65
France	$62.50	$41.27	$3.44	$15.21
Germany	$113.32	$114.22	$14.49	$35.22
India	$21.90	$7.69	$1.38	$4.75
Italy	$8.95	$9.36	$0.49	$3.91
Japan	$94.27	$75.30	$9.03	$23.55
Korea	$255.72	$192.60	$25.37	$64.67
Netherlands	$26.25	$22.03	$1.89	$10.09
Russia	$36.83	$16.46	$3.05	$6.39
Spain	$24.05	$10.46	$1.78	$3.73
Sweden	$16.44	$6.54	$0.94	$3.16
Switzerland	$129.24	$75.21	$10.22	$25.73
United Kingdom	$11.73	$5.07	$0.86	$2.15
USA	$73.58	$30.34	$4.91	$16.69

Table 5. Descriptive statistics at country level (total per share values)

Country	Obs.	% of total sample	Total Brand Value	Total Market value	Total Common equity
Australia	52	2.1%	$ 247,234	$ 2,706,080	$ 1,436,070
Brazil	35	1.4%	$ 232,362	$ 1,305,378	$ 1,425,814
Canada	79	3.1%	$ 337,737	$ 2,761,560	$ 1,456,788
China	170	6.8%	$ 1,487,319	$ 8,502,102	$ 8,896,985
France	190	7.5%	$ 1,392,151	$ 6,718,483	$ 5,279,659
Germany	156	6.2%	$ 1,442,968	$ 5,688,939	$ 4,467,192
India	48	1.9%	$ 268,692	$ 1,273,166	$ 461,415
Italy	32	1.3%	$ 262,280	$ 1,076,024	$ 1,396,820
Japan	310	1.3%	$ 2,230,915	$ 8,469,801	$ 7,093,548
Korea	46	1.8%	$ 543,214	$ 1,808,288	$ 1,547,412
Netherlands	53	2.1%	$ 470,181	$ 2,082,604	$ 2,430,501
Russia	34	1.4%	$ 131,169	$ 1,659,110	$ 1,826,905
Spain	54	2.1%	$ 435,603	$ 2,513,005	$ 1,665,737
Sweden	39	1.5%	$ 202,661	$ 1,139,545	$ 563,321
Switzerland	72	2.9%	$ 545,847	$ 4,047,327	$ 1,841,006
United Kingdom	170	6.8%	$ 1,387,061	$ 7,831,528	$ 5,839,389
USA	978	38.8%	$ 14,278,904	$ 59,939,107	$ 26 323,706
Total	**2,518**	**100,0%**	**$ 25,896,298**	**$ 119,522,047**	**$ 73,952,266**

4. Results & Discussion

Results are reported in Table 6. As before explained, we run separated OLS regression for each of the 17 subsamples (i.e. country). Even if adjusted R^2 are higher than 87% in median, showing that the model is fitting good, we find statistically insignificant brand coefficients for Australia, Brazil, India, South Korea and Netherlands, meaning that this kind of information has no informative content for investors in those countries. In particular, for Australia this could be explained by the fact that Australian GAAPs allow to report internally generated intangible assets, such as brands. Consequently, investors already appreciate the brand value recognized in the balance sheet.

Italian brand coefficient is statistically significant and its negative value can be explained by the particular sample composition: actually, most of the firms are considered to have Business-to-Business activity. This characteristic produces a lower value relevance for brand values, as demonstrated by Kirk et al. (2013).

The hypothesis of our research is thus confirmed, since we find a different, and sometimes null, value relevance of brand values in different countries. However, further analyses would be needed to test why brand values are not value relevant in Brazil, India, South Korea and Netherlands.

Table 6. Multivariate analysis results by sub-sample

Country	R2	Adjusted R2	Obs.	Brand Coefficient	Brand Significance
Australia	0.873	0.830	52	0.3097	0.795
Brazil	0.771	0.630	35	-0.2083	0.108
Canada	0.689	0.621	79	2.3166	**0.016
China	0.761	0.734	170	0.4271	**0.013
France	0.626	0.586	190	2.1244	***0.000
Germany	0.929	0.920	156	1.5239	***0.000
India	0.792	0.704	48	0.7241	0.180
Italy	0.878	0.789	32	-1.2155	***0.001
Japan	0.988	0.987	310	1.3121	***0.000
South Korea	0.971	0.955	46	-1.1644	0.290
Netherlands	0.927	0.891	53	-0.0974	0.232
Russia	0.982	0.970	34	1.8666	***0.001
Spain	0.791	0.716	54	2.7639	*0.054
Sweden	0.963	0.939	39	1.4046	*0.071
Switzerland	0.956	0.944	72	1.0560	***0.001
UK	0.783	0.757	170	1.7913	***0.000
USA	0.731	0.725	978	1.7213	***0.000

*$p < 10\%$, **$p < 5\%$, ***$p < 1\%$

5. Conclusions

Prior literature provides many evidences that the value relevance of accounting data differs across countries and it is affected by the institutional context and environmental characteristics. No previous study examines the cross-country value relevance of brand values provided by third-independent parties. Since almost all the accounting standards reject the recognition of internally generated intangible assets, investors often use information provided by third-independent parties, such as brand values. The aim of this study is to test whether the value relevance of brand values differs across countries. We selected a sample of brand values provided by Brand Finance from 2008 to 2015 owned by firms settled in 17 different countries. To verify our hypothesis, we run the traditional value relevance regression model in order to test the differences in the value relevance of brand values across countries. The model is proven to be unaffected by endogeneity bias, therefore brand values coefficients explain how these values are incorporated into stock prices. This result is a first insight about how market participants appraise this specific data. All subsamples have been analyzed equally and R^2 values (above 60%) indicate that the model is "well fitting". Results show that brand values: i) are differently reflected in each country and ii) are not value relevant in some cases, in particular in Australia, Brazil, India, South Korea and Netherlands. Since investment choices need to be supported by different information, investors and practitioners should keep in mind which information is reflected into stock prices and how. Considering that brand values are proven to be value relevant by previous literature and that cross-country value relevance of accounting data has been already investigated, this contribution could improve the use of brand related information in capital allocation choices. Also, this practical implication is particularly important for cross country and foreign investments, seeing that each market reflects brand values differently due to the influence of country-specific factors. Even if findings are promising, this paper represents a first step to test whether information relevance is affected by environmental characteristics and institutional context. Certainly, these factors are able to influence the informative process of investors and therefore they need to be further investigated.

Our study is affected by different limitations. Firstly, countries sub-sample are heterogeneous in dimension and in composition. Secondly, we do not identify which factors affect the informative content of brand values. Future research should be focused in this direction. However, our results are consistent with previous studies and this exploratory work offers evidence on the existence of different informative content of third parties brand values across countries.

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Appendix: List of Brand Finance reports

Report Name	Year
Global 500	2008
Global 500	2009
Global 500	2010
Global 500	2011
Global 500	2012
Global 500	2014
Global 500	2015
Global 500	2016
Airlines 50	2015
Auto 100	2015
Banking 500	2015
Drinks 50	2015
Fast food 10	2015
Food 25	2015
Insurance 50	2015
Oil & Gas 50	2015
Pharma 10	2015
Retail 50	2015
Soft Drinks 10	2015
Tech 100	2015
Telecoms 500	2015
Tobacco 10	2015
Utilities 15	2015
Spirits 50	2016

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Relationship Marketing in Tertiary Education: Empirical Study of Relationship Commitment and Student Loyalty in Hong Kong

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Abstract

This study attempts to investigate the applicability of relationship marketing concepts in the private tertiary education industry. With the rapid growth of tertiary education and new academic structure in Hong Kong, it is interesting to investigate the relationship between relationship commitment and student loyalty, and the key determinants of relationship commitment, in a leading private tertiary education institution in Hong Kong. Questionnaires were designed to collect data, and structural equation modeling approach was adopted to evaluate the explanatory power and casual links of the model. The results indicate that relationship commitment is a driver of student loyalty. Relationship benefits and trust are found to have positive influence on relationship commitment. Relationship termination costs and shared values are found to have non-significant roles in determining relationship commitment in private tertiary education environment, while shared value has a significant positive impact on trust. The research provides new insights to the management of private tertiary education providers in building relationship with students and resources allocation. The study discusses the implications of the findings and suggests areas for future research.

Keywords: relationship marketing, private tertiary education, student loyalty, relationship commitment

1. Introduction

Tertiary education is essential for a society's development. The role of tertiary education is widely recognized globally. In addition to the public tertiary education, there has been a vigorous development of private tertiary education (PTE) in the past recent decades. Since PTE institutions are receiving minimal or no government funding, students have to pay tertiary tuition fees for private tertiary education. In order to enhance the admission to PTE, many countries have successfully introduced different student loan schemes for postponing the costs of education until after graduation. Demand for tertiary education has been boosted and rapid growth in PTE resulted.

Due to the fast-developing self-financing post-secondary education and the trend of young couples having fewer children, more opportunities exist for higher secondary school graduates to enter tertiary educational institutions and thus private educational institutions are facing keen competition in recruiting and retaining students. It is a great challenge for them to generate sufficient revenues for running the institutions in the competitive education market.

Building relationship with customers is crucial for business to sustain competitive advantages (Wong and Sohal, 2002). Relationship marketing benefits both the customer and firm. Firms can be benefited in retaining customers and attracting new customers (Berry, 1995). Retaining customers and keeping them loyal is significant to service industry (Pritchard et al., 1997). Benefits of having continued customer loyalty to the organization are well understood (Berry and Parasuraman 1991; Reichheld and Sasser 1990; Reichheld 1993).

Commitment has positive effect and enhances the desire of the students to continue in the school till graduation. Commitment can be increased by enhancing the level of trust with the students. (Adidam et al., 2004). Developing student loyalty is important for tertiary educational institutions to seek for financial sustainability (Carvalho and de Oliveira Mota, 2010).

Education in Hong Kong

In view of the change to a knowledge-based economy, the Hong Kong Government attaches great importance to

the development of tertiary education in order to equip and upgrade young people to contribute to society. To cater for Hong Kong's strong intention to become a regional education hub, comprehensive reviews and reforms on tertiary education have been carried out in Hong Kong since the 1990s. In addition to the publicly-funded programmes offered by the local universities, PTE emerged.

Over the past decades, students were required to attempt the Hong Kong Certificate of Education Examination (HKCEE) upon completion of five-year secondary education which acted as a filter for the students to attempt the (Hong Kong Advanced Level Examination) HKALE upon completion of the two-year higher secondary education before being admitted to the three-year undergraduate programmes.

A new academic structure "3-3-4" Scheme for senior secondary education and tertiary education in Hong Kong has started from the school year 2009/10. It is different from the old curriculum as having completed the three-year junior secondary education, students will receive three years of senior secondary education and attempt the new Hong Kong Diploma of Secondary Education (HKDSE), a prerequisite to being eligible to receive the four years of university education.

Since 2012, the HKDSE under the New Senior Secondary (NSS) curriculum and assessment of the new academic structure has replaced HKCEE and HKALE and prepared students for entering university after their secondary school education.

Under the NSS curriculum, students of HKDSE are one year younger than the students of HKALE, and the students of HKDSE only have to take one public examination whereas students of the HKALE have to take two public examinations before entering the tertiary education. It is in general believed that the students of HKALE are more mature and tough than students of HKDSE.

In light of providing young people more opportunities to access to tertiary education, it is the government's policy to strive for the parallel development of the publicly-funded and PTE sectors. There has been a rapid expansion in the PTE sector. In the past ten years from 2005 to 2015, the number of full-time accredited private tertiary programmes has increased by 67% from 273 to 455, including a rise in the number of full-time private bachelor degree programmes by 213% from 40 to 125 with flexible study pathways of multiple entry and exit points. The number of student enrolments in PTE after completion of secondary level also increased by 67% from 36,922 to 61,582 (iPASS). The ratio of tertiary to secondary students increased from 62.7% in 2010/11 to 88.2% in 2015/16 (EDB). The PTE sector has been facing keen competition with the increase in supply in the past few years.

Because of the changes in the background of students entering tertiary education and the rapid growth in the PTE sector, it is worthwhile to study the applicability of relationship marketing in private tertiary education environment. Based on Morgan and Hunt's model (1994) in relationship marketing perspective, the objectives of this study are to investigate relationship benefits, relationship termination costs, shared values and trust, as the four key factors affecting the relationship commitment, and examine the effect of relationship commitment on student loyalty in the PTE context in Hong Kong.

2. Literature Review

Relationship Marketing

Relationship marketing was first introduced in the services marketing literature by Berry as "attracting, maintaining and in multi-service organizations - enhancing customer relationships" (Berry, 1983, p. 25). The definition of relationship marketing presented by Gronroos is "to establish, maintain and enhance relationship with customers and other partners that are done by a mutual exchange and fulfilment of promises" (Gronroos, 1990, p.5). Harker (1999) examined the definitions of relationship marketing and seven fundamental conceptual categories were identified.

Relationship marketing has a positive impact on customer loyalty (Berry, 1983, 1995; Alrubaiee and Al-Nazer, 2010; Firdaus and Kanyan, 2014). Commitment is a key factor contributes to the success of relationship marketing (Morgan and Hunt, 1994; Wu, Weng and Huang, 2012). With commitment, loyalty results and leads to long-term profitability (Miquel-Romero et al., 2014). For high-tech firms, relationship marketing is an effective strategy for enhancing partner loyalty and satisfaction (Wu, Weng and Huang, 2012).

Relationship marketing in education context

Relationship marketing in the PTE sector is defined as "a set of marketing activities or actions that attract, motivate, and enhance existing and potential students' relationships as well as students' parents, relatives, friends, reference groups for the benefit of all sides concerned, emphasizing on retaining existing students until their

graduation, and attracting further students" (Al-Alak, 2006, p. 4). It is very important for the tertiary education sector to establish a high level of ability to attract, acquire and retain students until graduation (Al-Alak, 2006).

Perin et al. (2012) confirms Al-Alak's findings (2006) to attract and retain students by creating 'added value' for students that leads to student satisfaction and continued relationships. Tinto (1975) discussed the interaction between students and their tertiary educational institutions. It was suggested that student retention is directly affected by commitment and commitment is directly affected by the integration of students into the system of the educational institution and external commitments.

Relationship Commitment

Commitment is a concept from social psychology (Festinger, 1957; Kiesler, 1971; Kelley, 1983) applied to the field of marketing. Affective commitment has been studied in the context of relationship marketing (Morgan and Hunt, 1994; Kumar et al., 1995; Gundlach et al., 1995). It is an emotional commitment which reflects a psychological attachment to the partner (Geyskens et al., 1996; Bello and Gilliland, 2002; Sweeney and Swait, 2008). The continuance commitment reflects the need to maintain the relationship for avoiding perceived switching costs (Bansal and Taylor, 1999a, 1999b, Fornell, 1992; Ping, 1993, Jones et al., 2000; Sharma and Petterson, 2000). Normative commitment is the result that incorporates from the individual standards of his social environment (Dwyer et al., 1987; Heide and John, 1992; Gundlack and Murphy, 1993). The commitment, particularly affective commitment is an essential factor in the development of customer relationship loyalty (Amani, 2015).

Relationship commitment in education context

Commitment refers to how much the students' abilities, skills, and value system fits the university's expectations, demands, and values (Rojas-Méndez et al., 2009).

Commitment as a drive to loyalty (Fournier, 1998; Sheth & Parvatiyar, 1995) has been applied to academic institutions (Perin et al., 2012). Institutional commitment is positively associated with student retention and persistence (Schertzer and Schertzer, 2004). Students' commitment to their academic institution is determined by the degree of academic and social integration such as the participation in university societies and committees and the friendships and acquaintances with fellow students (Tinto, 1975, 1993; Rojas-Méndez et al., 2009).

Relationship commitment is an important issue that influences students' loyalty in tertiary educational institution (Rojas-Méndez et al., 2009; Chen, 2016). The level of relationship commitment is affected by the relationship benefits, shared values, relationship termination costs and trust in the public tertiary education context (Holdford and White, 1997; Adidam et al., 2004). This study adopts Moorman et al.'s (1992) conceptualization of relationship commitment as an enduring desire to maintain a valued relationship.

Relationship Benefits

Relationship benefits refer to the quality of services and goods relative to other suppliers that have positive influence on relationship commitment, such as continuation of a relationship (Gwinner et al., 1998; Patterson and Smith, 2001). Bitner (1995) identified the benefits to customers of staying in a service relationship including prediction of service quality and comfort, reduction of stress, ignoring switching costs and change. Customers feel comfortable if the relationship is predictable and trust is built. Time and effort in switching to another service provider are saved.

Beatty et al. (1996) categorized social relationship between the customer and sales associate i.e. relationship selling in a retail context that emphasizes the friendship and interaction with the salesperson. Social benefits play an important role on experienced customers' commitment to service provider (Dagger and O'Brien, 2010). Company may benefit from measuring the necessary dimension of the consumers' perceived quality from the company's perspective (Zeithaml et al., 1988).

Relationship between Relationship Benefits and Relationship Commitment

The business relationship can be affected by the benefits provided by the supplier to the buyer (Jiang et al., 2010). The level of customers' relationship experience in social benefits reflects significant implication on their commitment to service provider (Dagger & O'Brien, 2010). The relationship marketing concepts can also be applied in the non-profit sector. There are positive impacts between the relationship benefits and the relationship commitment in the non-profit sector (Macmillan et al., 2005). Treating students as partners to the institution and adopting a customer orientation toward students are essential in establishing a sense of mutual relationship–based commitment (DeShields et al., 2005).

Adidam et al. (2004) and Holdford and White (1997) examined the impact of relationship benefits on relationship commitment, and concluded that the higher the relationship benefits received by the students, the higher the relationship commitment of students is to their educational institution. Similar conclusions were drawn in the graduates of HKALE in Hong Kong's PTE (Wong and Wong, 2011). This study follows Adidam et al. (2004) and Holdford and White (1997) conceptualization of relationship benefits. Using the aforesaid literature, the first hypothesis is formulated:

H1: Students' perception of relationship benefits has a significant positive impact on relationship commitment.

Relationship Termination Costs

It is common that the "termination costs" and "switching cost" are used interchangeably in research studies. Thus both the termination costs and switching costs are examined in this study.

Termination costs are the expected losses from termination resulted from the perceived lack of potential alternative partners, the expense of relationship dissolution and/or substantial switching costs (Morgan and Hunt, 1994; Chang et al., 2012).

Burnham et al. (2003) classified switching costs as procedural switching costs, financial switching costs and relational switching costs that significantly influence customers' desire to stay or leave their current service provider. Procedural switching costs concern the expense of time and effort. Financial switching costs concern the expense of financial resources, and relational switching costs concern psychological or emotional discomfort because of the loss of identity and the breaking of bonds.

White and Yanamandram (2007) suggested switching costs include uncertainty costs, pre-switching costs, set-up costs, post-switching costs, and benefit/loss costs that are the psychological uncertainty cost in switching to a new service provider (Mitchell, 1999), the time and effort in searching alternatives (Jones et al., 2002), the time and effort in starting the relationship with a new provider (Guiltinan, 1989), adaption to the new provider (Jones et al., 2002), the benefit of staying with the current provider (Guiltinan, 1989) and the perceived loss of benefits in terminating the relationship with the current provider (Turnball and Wilson, 1989).

The perceived costs to a student of terminating a relationship with business school might be the loss of friendships developed at school or the risk that course credits at the school might not be accepted at another school (Holdford and Wright,1997). It may cost time and energy to a student to switch to another institution.

Relationship between Relationship Termination Costs and Relationship Commitment

High perceived switching costs lead to an ongoing current relationship. In addition to economic switching costs, socio-psychological costs such as loss of reputation may also lead to client retention (Dwyer et al., 1987).

Customers' trust and satisfaction vary with the conditions of switching costs, attractiveness of alternatives and client experience. If the perceived economic and psychological costs of developing a new relationship are high, a client will tend to stay with the current relationship (Bansal and Taylor, 1999a, 1999b, Fornell, 1992; Gundlack and Murphy, 1993; Ping, 1993, Sharma and Patterson, 2000; Amani, 2015).

Adidam et al. (2004) examined the relationship between students and their schools and suggested that the relationship termination costs have a positive impact on relationship commitment in the western public tertiary educational institutions. The relationship termination costs are the students' perceived net losses resulting from the termination of the relationship. These include both economic and non-economic sides of switching costs such as loss of friendships or loss of credits on switching to another educational institution. This study adopts conceptualization of relationship termination costs in Porter (1980). Based on the aforesaid literature, the second hypothesis is formulated:

H2: Students' perception of relationship termination costs has a significant positive impact on relationship commitment.

Shared Values

Different researchers have different interpretation of shared values between parties. Tsai and Ghoshal (1998) defined shared values as a shared code to facilitate a common understanding or perception of collective goals and actions. Shared value leads to more opportunities for the exchange of ideas. In the shared perspective, Levin (2004) examined shared vision and share language while Orr (1990) and Monteverde (1995) examined the shared language and shared narratives. According to social sciences research, sharing information among parties that link people together and establish relationships is considered as shared values (Duncan and Moriarty, 1998; Mohr and Nevin, 1990).

Morgan and Hunt (1994) defined shared values as "the extent to which partners have beliefs in common about what behaviors, goals and policies are important or unimportant, appropriate or inappropriate, and right or wrong" (Morgan and Hunt, 1994, p.25). Shared value is a key component in building buyer–seller relationships (Wilson 1995; Macmillan et al. 2005; Heffernan et al. 2008). In service industry, similar shared values enhance relationship between the parties (Tsai and Ghoshal, 1998).

Relationship between shared value and relationship commitment

Having shared values leads to a tertiary level of trust (Coulter and Coulter 2002). In tertiary education, shared values are positively associated with trust (Holdford and White, 1997; Adidam, et al., 2004; Wong and Wong, 2011). As shared values enhance relationship, shared values lead to positive impact on relationship commitment (Holdford and White, 1997; Adidam et al., 2004).

Students would be more likely to commit to a relationship with the institution if they had shared objectives, ideals, codes of conduct, learning methods, and assessments with their educational institution (Holdford and White 1997; Adidam, et al., 2004).

Shared values have positive impact on relationship commitment if they share similar beliefs in behaviors, goals and policies. Having similar values to the educational institution increases graduate trust (Holdford and White 1997; Wong and Wong 2011; Schlesinger et al., 2016). This study adopts the conceptualization of shared values in Morgan and Hunt (1994). Based on the aforesaid literature, the third hypothesis is formulated:

H3: Students' perception of shared values has a significant positive impact on relationship commitment.

Trust

Trust is defined as the reliance on the word, promise, oral or written statement by an individual to another or group in the classical studies of psychology, sociology and economics (Rotter, 1967). Different researchers have numerous interpretations of trust in the marketing literature. Many of them consider trust as a kind of belief or confidence on the partner's reliability and integrity and it is the most important dimension that leads to customer loyalty (Morgan and Hunt 1994; Firdaus and Kanyan, 2014).

Relationship between trust and relationship commitment

Trust is the essential drive for commitment (Dwyer & Tanner, 2002; Morgan & Hunt, 1994) since trust leads to returned customers (Berry, 2002). Trust derives from customers' positive experiences that build continuous relationship (Vesel and Zabkar 2010). Dagger and O'Brien (2000) noted that experience over time built between parties results in greater trust (Bove and Johnson, 2000), which leads to commitment to the relationship (Gill et al., 1998). Trust is paired with commitment to building long-term relationship (Firdaus and Kanyan, 2014). A number of empirical studies have revealed that trust has positive impact on customer loyalty (Alrubaiee and Al-Nazer, 2010; Ndubisi, 2007; Aminu, S. A., 2012).

In educational context, trust is students' confidence in the educational institution's integrity and reliability (Rojas-Méndez et al., 2009). Student's trust leads to a positive impact on student's commitment and loyalty to their institution (Perin et al., 2012). Trust is important in retaining current students and attracting new students for tertiary educational institutions (Schlesinger et al., 2016). In this study, trust is conceptualized as the one used by Morgan and Hunt (1994). Based on the abovementioned studies, the fourth hypothesis is formulated:

H4: Students' trust in the educational institution has a significant positive impact on relationship commitment.

Relationship between Shared Values and Trust

Shared value is an antecedent to relationship commitment, as well as to trust (Morgan and Hunt, 1994; Mukherjee and Nath, 2007). Higher shared values between partners lead to a higher level of trust (Conner and Backer, 1975). Shared values may facilitate the achievement of common goals, reduce interpersonal barriers and thus lead to trust (Coulter and Coulter, 2002). Customers' shared value is a factor that promotes trust (Wong, 2009).

Shared value is positively related to trust in tertiary education (Holdford and White, 1997; Adidam, et al., 2004; Wong and Wong 2011). Graduates' trust increases when they have similar value perception of the educational institutions (Schlesinger et al., 2016). Based on the abovementioned studies, the fifth hypothesis is formulated:

H5: Students' perceptions of shared values have a significant positive impact on trust.

Loyalty

Customer loyalty captures the long-term relationship between customers and companies, therefore repurchase intent, referral intent and repeated purchases can be resulted, which is regarded as a key to success in business

(Hart and Johnson, 1999; Bowen and Chen, 2001; Firdaus and Kanyan, 2014).

Loyalty comprises two aspects: repurchase intention and word-of-mouth (Zeithaml et al., 1996). Repurchase intention is a customer's judgement in repurchase a product or services again from the same company (Hellier et al., 2003). Word-of-mouth refers to saying some positive things about the company and recommending the company to others.

Student loyalty in education context

Student loyalty is crucial in relationship marketing which is a key objective in tertiary education (Hennig-Thurau et al., 2001). Students are regarded as customers (Hennig-Thurau et al., 2001; Brown and Mazzarol, 2009). Building and maintaining student loyalty are similar to customer loyalty, both of which are the essence of marketing (Gulid 2011; Dehghan et al., 2014). Loyalty is a key element in tertiary educational institutions that brings success in a competitive market (Chen, 2016). Trust and commitment have positive impacts on the relationship quality of international students that leads to loyalty to tertiary educational institutions (Bergamo et al. 2012; Chen, 2016).

Tinto (1975, 1993), Hennig-Thurau and Klee (1997), and Hennig-Thurau et al. (2001) suggested that student loyalty is directly affected by perceived service quality and emotional commitment and the antecedents of emotional commitment are academic integration and commitment to non-educational institution activities. Student satisfaction with the programme is a key factor for enhancing student loyalty (Dehghan et al., 2014). Student satisfaction that builds loyalty is also shaped by emotional factors, and institutional image is an important construct for tertiaty students (Brown and Mazzarol 2009; Mihaela, 2012; Schlesinger et al., 2016).

Loyal students are willing to recommend the course or the institution to others, join alumni association and select the institution again for future studies (Hennig-Thurau et al., 2001; Brown and Mazzarol, 2009; Perin et al., 2012). Students' commitment and active participation influence teaching quality (Rodie and Kleine, 2000). With loyal students, educational institutions have the ability to attract new students and retain existing students (Dehghan, 2014).

As gaining new students is more costly than maintaining current students, student retention helps educational institutions in their cost reduction (Reichheld, 1996; Akarapanich, 2006; Dehghan, 2014).

Relationship between Loyalty and Relationship Commitment

Commitment is a key for achieving customer loyalty that leads to the development of long-term relationships (Anderson and Narus, 1990; Firdaus and Kanyan, 2014). The affective commitment has been studied in the context of relationship marketing extensively (Morgan and Hunt, 1994; Kumar et al., 1995; Gundlach et al., 1995). It is an emotional commitment that reflects a psychological attachment to the partner (Geyskens et al., 1996; Bello and Gilliland, 2002; Verhoef et al, 2002; Sweeney and Swait, 2008). Affective commitment is a crucial variable in developing customer loyalty (Amani, 2015).

Commitment plays positive impact on loyalty (Fournier, 1998; Sheth & Parvatiyar, 1995) since there are significant interactions between continuance and effective commitment and consumer loyalty (Fullerton, 2003), and such an idea has been applied to academic institutions (Perin et al., 2012). Relationship commitment is an important issue that influences students' loyalty in tertiary education institution (Rojas-Méndez er al., 2009; Chen, 2016). Loyal students can positively influence education quality of the educational institutions through their active participation (Perin et al., 2012). With loyal students, educational institutions have the ability to attract new students and retain existing students (Dehghan et al., 2014). In this study, loyalty is characterized as repurchase intention, and based on the aforesaid literature, the sixth hypothesis is formulated:

H6: Students' relationship commitment to the educational institution has a significant positive impact on student loyalty.

Having reviewed the previous literature and developed the hypotheses for this study, next section will identify the research methodology.

3. Research Methodology

This study used questionnaire to collect primary data from students of one of the largest PTE providers regarding the relationship between relationship commitment and student loyalty, and the factors affecting relationship commitment. Moreover, students of pilot test also indicated that they were comfortable with filling in the questionnaires.

The first part of the questionnaire consists of twenty-two questions on the respondents' perceived relationship benefits, relationship termination costs, shared values, trust, relationship commitment and student loyalty towards their educational institution. The second part consists of four questions on the respondents' demographic characteristics. Demographic questions inquire about respondents' gender, age, division of study, and course of study.

This study adopted previously developed and validated measures without substantial alterations. Validated measures of relationship benefits and shared values were taken from two previous studies in education context (Adidam et al., 2004; and Holdford and White, 1997). Regarding relationship termination costs, this study utilized validated measures from Sharma and Patterson (2000). Some wordings were modified to fit the education context. Validated measures of trust and relationship commitment from a previous study in education context (Holdford and White, 1997) were adopted. Validated measures of student loyalty from a previous study in education context (Nguyen and LeBlanc, 2001; Wong and Wong, 2011) were adopted. The scale of the six constructs was operationalized as a 7-point Likert scale from Strongly Disagree to Strongly Agree.

Descriptive statistics, including means, standard deviations, and correlation coefficients among the measures were presented in Table 1. Normally, psychological constructs are often measured with measurement error, leaving the error issues unaddressed results biased estimates of structural relationships. Thus, structural equation modeling (SEM) was employed to examine the proposed mediation model, handling constructs via latent variable approach (Iacobucci, Saldanha & Deng, 2007). Assessment of model fit was based on multiple criteria, including absolute misfit and incremental fit indices. A model with Root-Mean-Square Errors of Approximation (RMSEA, Steiger & Lind, 1980) <0.08, Non-Normed Fir Index >0.90 and Comparative Fit Index (CFI, Bentler, 1990) >0.90 was considered as having acceptable fit to the data (Hoyle, 1995). All the analyses were conducted using Mplus 7.0 (Muthén & Muthén, 2011) with maximum likelihood estimation.

3. Research Analysis

A total of 291 valid responses (126 female, 165 male) were collected in this study. 44.5% of respondents aged 16 to 18, and 55.5% aged 19 to 22. Most of the students (91.7%) were studying associate degree, and there were 8.3% of tertiary diploma students. More than half of the students (57.6%) were from the business division, while 39% and 3.4% were from science and technology, as well as communication and social science divisions respectively.

Overall Model Assessment

Overall, the mediation model fitted the data well, $\chi^2(200) = 526.82, \chi^2/df = 2.63, p < .001$, CFI = .92, NNFI = .91, RMSEA = .075 (Table 2). Low p-values and relatively high χ^2/df ratio of a model indicate inadequate fit of the model. However, the Chi-square index is sensitive to sample size; it is not adequately indicative of the extent to which the model does not fit. The larger the sample size is, the tertiary the chance of the model being rejected for fit, whether it is true or false (Bagozzi and Yi, 1988). Relying on Chi-square index alone might cause rejection of a model with a good fit. Therefore, alternative overall fit indices were used: NNFI, CFI, and RMSEA. All fit indices were found to be in an acceptable range, from 0.91 to 0.92, and the RMSEA of the latent mediation model was 0.075 which was below the minimum requirement of 0.08. In conclusion, the latent mediation model was considered to fit the data well.

Measurement Model Assessment

Before investigating structural relations among different constructs, reliability and convergent validity of the constructs were first assessed to ensure the quality of the measured constructs.

Reliability

Reliability refers to the internal consistency of a set of measurements or measuring instrument. The Cronbach's Alpha is commonly used to measure instrument reliability and its value ranges between 0 and 1. The closer it is to one, the tertiary is the reliability of the instrument. A commonly accepted rule-of-thumb is that an alpha of 0.6-0.7 indicates acceptable reliability, and 0.8 or tertiary indicates good reliability. In preliminary analyses, alpha coefficients of reliability were estimated by using SPSS version 13.0 for scales from each instrument (Table 3). Reliability coefficients of the six constructs ranged from 0.701 to 0.913. These statistics show that the measuring instruments used in this study have moderate to high reliability (internal consistency) coefficients for the sample of respondents.

Convergent Validity

Reliability of a set of measurements or measuring instruments, as measured by alpha coefficient, estimates the

extent to which there is internal consistency among items (Asubonteng et al., 1996; Bagozzi & Yi, 1988). Thus, the satisfactory alpha estimates obtained from the reliability test (Table 3) demonstrate good convergent validity. Further, the significantly high and moderate loadings of indicators in the measurement model also provided sufficient evidence of convergent validity of the constructs, as shown in Table 4 (Anderson & Gerbing, 1998; Dabholker, Thorpe & Rentz, 1996; Patterson et al., 1997). Overall, all factor loadings were statistically significant (*ps* < .001), ranging from .30 to .96. In addition, the moderate to high correlations between constructs (Table 1) also suggested that measures of the model display a certain degree of convergent validity (Cronin & Taylor, 1992; Quester & Romaniuk, 1997).

Structural Model Assessment

Consistent with the Hypothesis 1 (Table 5), relationship benefits positively predicted relationship commitments, $\beta = .54$, $p < .001$, 95% CIs [.36, .72], which in turn positively predicted student loyalty, $\beta = .41$, $p < .001$, 95% CIs [.30, .52] (Hypothesis 6). Taken together, relationship commitments mediated the effect relationship benefits on student loyalty, yielding a significant indirect effect, estimate = .22, $p < .001$, 95% Bias-corrected Bootstrap CIs [.10, .34]. Contradictory to the expectation, relationship termination costs and shared values did not yield significant prediction to relationship commitments (Hypothesis 2 and 3), *p*s > .05. Finally, supporting Hypothesis 4 and 5, shared values positively predicted trust, $\beta = .73$, $p < .001$, 95% CIs [.67, .80], which in turn positively predicted relationship commitments, $\beta = .16$, $p = .022$, 95% CIs [.02, .30], and then student loyalty. This three-path mediation was qualified by a significant indirect effect, estimate = .05, $p = .028$, 95% Bias-corrected Bootstrap CIs [.003, .10], indicating that the effect of shared values on student loyalty worked through trust and relationship commitments. Overall, the predictors explained 63.1% of total variance in relationship commitments and 16.8% of total variance in student loyalty. Results of hypotheses testing and structural equation model were shown in Table 5 and Figure 1 respectively.

Perceptual Differences of Constructs across Divisions

To test perceptual differences of relationship benefits, relationship termination costs, shared values, trust, relationship commitment and student loyalty across divisions (i.e., business, science and technology, as well as communication and social science), six sets of one-way ANOVA were conducted. The results (Table 6) reviewed that significant differences were found on most of the constructs, except on relationship termination costs, across divisions. In general, students in Business division scored highest in all constructs, except in student loyalty and relationship termination costs. For relationship benefits, students in Science and Technology divisions scored in between students in Business division as well as students in Communication and Social Sciences division. For shared values and trust, students in Communication and Social Sciences division scored in between students in Business division as well as students in Science and Technology divisions.

Comparison between HKDSE and HKALE students

A similar study had been conducted years ago for HKALE students (Wong and Wong, 2011). As mentioned earlier, HKALE students have to take two public examinations before entering tertiary education while HKDSE students just need to take one public examination, and HKALE students are older than HKDSE students in general.

Multiple-group structural equation modelling has been employed to compare the structural parameters in the proposed model across HKDSE ($N = 291$ in current study) and HKALE students ($N = 444$ in previous study). In the structural equation model, factor loadings were constrained as equal across HKDSE and HKALE students, while all other parameters were allowed to freely varied (Figure 2 and 3).

Overall, the proposed model has an acceptable fit to data, $\chi^2 (422) = 1372.85$, $\chi^2/df = 3.25$, $p < .001$, CFI = .91, NNFI = .90, RMSEA = .078. Based on the multiple-group analysis, similarities and differences in the strength of the structural parameters can be observed between HKDSE and HKALE students (see Figure 2 and 3). For the commonalities across HKDSE and HKALE students, relationship benefits significantly and positively predicted relationship commitment (comparison estimate = .348, $p = .079$), while shared values could not predict relationship commitment (comparison estimate = .004, $p = .985$) in both two samples. In addition, shared values positively predicted trust in the same magnitude across two samples (comparison estimate = .112, $p = .226$). For the differences across HKDSE and HKALE students, it has been found that relationship termination costs significantly and positively predicted relationship commitment among HKALE students but not HKDSE students (comparison estimate = -.546, $p < .001$), while trust significantly and positively predicted relationship commitment among HKDSE students but not HKALE students (comparison estimate = .245, $p = .028$). Finally, relationship commitment positively predicted student loyalty in both HKDSE and HKALE students; however, the magnitude of this structural parameter differed across these two samples (comparison estimate = -.322, *p*

< .001). Specifically, relationship commitment more strongly predicted student loyalty in HKALE students than in HKDSE students.

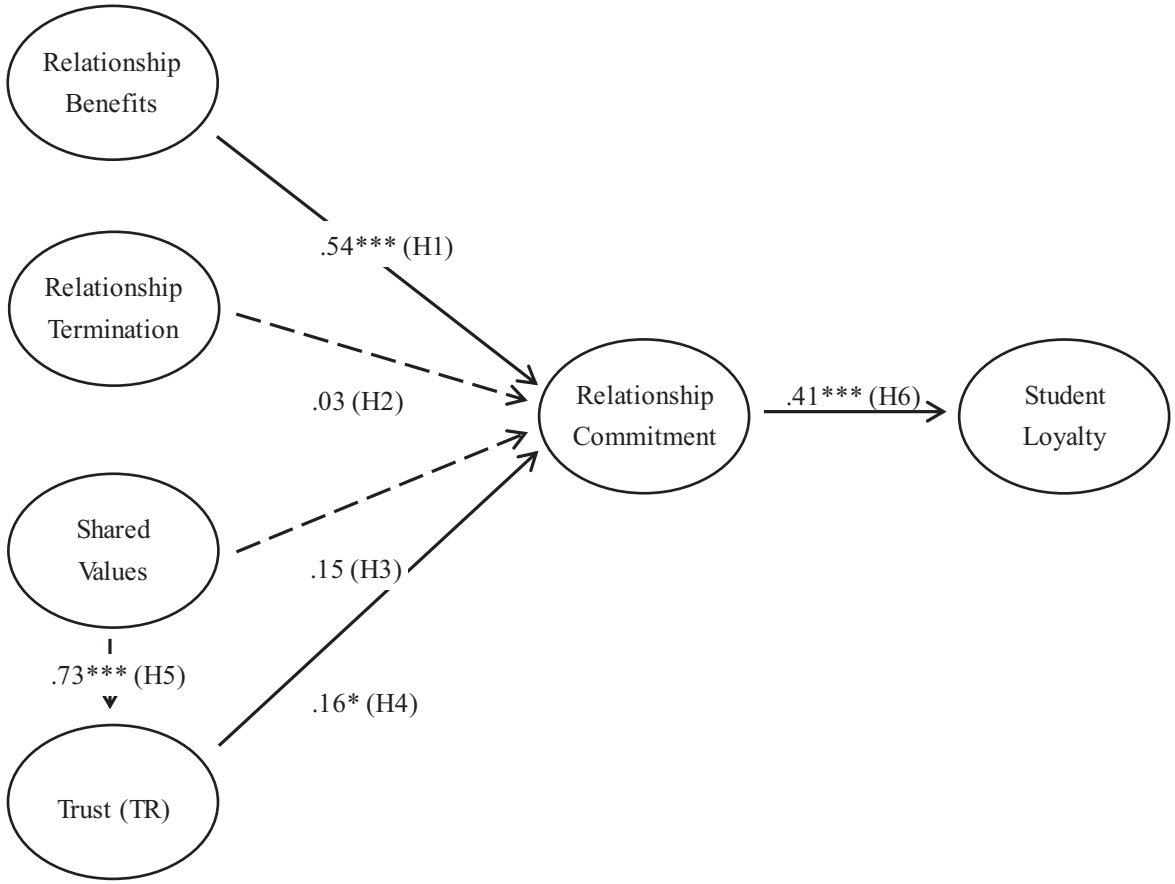

Figure 1. Structural equation model examining mediating effect of relationship commitment of different predictors on student loyalty (n = 291)

Dashed lines represent non-significant relationships ($ps > .05$)

*$p < .05$. **$p < .01$. ***$p < .001$.

$$R^2_{SL} = .168;\ R^2_{RC} = .631;\ R^2_{TR} = .533.$$

Table 1. Means, Standard Deviations, and Intercorrelations for the Measures (N = 291)

		M	*SD*	RTC	SV	TR	RC	SL
1.	RB	5.08	0.91	.41***	.64***	.61***	.69***	.44***
2.	RTC	4.80	0.82	-	.45***	.39***	.38***	.29***
3.	SV	5.08	0.88	-	-	.64***	.62***	.41***
4.	TR	5.43	0.88	-	-	-	.61***	.38***
5.	RC	4.96	1.05	-	-	-	-	.49***
6.	SL	5.13	0.97	-	-	-	-	-

Note. RB = Relationship benefits; RTC = Relationship termination costs; SV = Shared values; TR = Trust; RC = Relationship commitment; SL = Student loyalty.

***$p < .001$.

Table 2. Goodness-of-fit of the Latent Mediation Model

Fit Indices	Values	Desired Levels*
χ^2	526.82	--
Df	200	--
p-value	<.001	> 0.05
χ^2/df	2.63	< 3.0
Non-Normed fit index (NNFI)	0.91	> 0.90
Comparative fit index (CFI)	0.92	> 0.90
Root-Mean-Square Errors of Approximation (RMSEA)	0.075	< 0.08

Table 3. Reliability of the six constructs

	No. of items	Cronbach's Alpha
Relationship Benefits	4	0.804
Relationship Termination Costs	5	0.833
Shared Values	3	0.905
Trust	4	0.912
Relationship Commitment	3	0.913
Student Loyalty	3	0.701

Table 4. Results of Factor Loadings in Six Latent Constructs

Items	Factor loadings
Relationship Benefits (RB)	
RB1 My college provides several beneficial opportunities for the students, such as exchange programmes, company visits, placements, and professional seminars.	.73
RB2 The location of my college makes this the ideal college to attend.	.53
RB3 The money spent for study in my college is worth it because I can get a bachelor degree offer or I can get a job offer after I finish my study here.	.75
RB4 Overall, my college provides a high quality education.	.87
Relationship Termination Costs (RTC)	
RTC1 On the whole, it would cost me a lot of time and energy to find another college to study.	.46
RTC2 I would lose a lot of things if I transfer to another college, such as loss of friendship, and loss of credits.	.72
RTC3 It is risky to change to a new college because the new college may not give what I want.	.85
RTC4 I would feel frustrated if I terminate my study at my college.	.73
RTC5 Considering everything, the costs to terminate my study at my college and start my study at a new college would be high.	.79
Shared Values (SV)	
SV1 My college and I have similar views regarding appropriate behavior in the classroom.	.87
SV2 My college and I have similar views regarding reward structures for good performance in my study.	.85
SV3 My college and I think alike.	.89
Trust (TR)	
TR1 My college and lecturers make I feel that my well-being is important.	.79
TR2 My lecturers have high integrity.	.89
TR3 I trust lecturers completely.	.86
TR4 My lecturers are always acting in my best interests.	.87
Relationship Commitment (RC)	
RC1 I feel a strong bond to my college.	.86
RC2 I intend to maintain a relationship with my college after I graduate.	.90
RC3 My college deserves the commitment of its students.	.89
Student Loyalty (SL)	
SL1 I would attend degree courses at my college if it offers degree courses in future.	.83
SL2 I would attend the advanced courses at my college if it offers them in the coming years.	.96
SL3 If I had to apply for associate degree or tertiary diploma courses now, my college would be my first choices.	.30

Table 5. Testing of the Hypotheses

	Construct relationship	Standardized coefficients	t-value	Hypothesis supported
H1	RB -> RC	.54	4.677	Yes
H2	RTC -> RC	.03	0.471	No
H3	SV -> RC	.15	1.309	No
H4	TR -> RC	.16	2.302	Yes
H5	SV -> TR	.73	10.261	Yes
H6	RC -> SL	.41	5.436	Yes

Note. RB = Relationship benefits; RTC = Relationship termination costs; SV = Shared values; TR = Trust; RC = Relationship commitment; SL = Student loyalty.

***$p < .001$.

Table 6. One-way ANOVA of each construct by Division of Study

	Univariate F-value	Mean		
		Business	Science & Technology	Communication & Social Sciences
RB	27.80***	5.37[a]	4.72[b]	4.10[c]
RTC	1.15	4.86[a]	4.72[a]	4.66[a]
SV	11.06***	5.27[a]	4.79[b]	5.03[ab]
TR	15.23***	5.66[a]	5.11[b]	5.25[ab]
RC	22.68***	5.28[a]	4.51[b]	4.47[b]
SL	5.43**	5.25[a]	4.89[b]	5.40[ab]

Note. RB = Relationship benefits; RTC = Relationship termination costs; SV = Shared values; TR = Trust; RC = Relationship commitment; SL = Student loyalty.

*$p < .05$. **$p < .01$. ***$p < .001$.

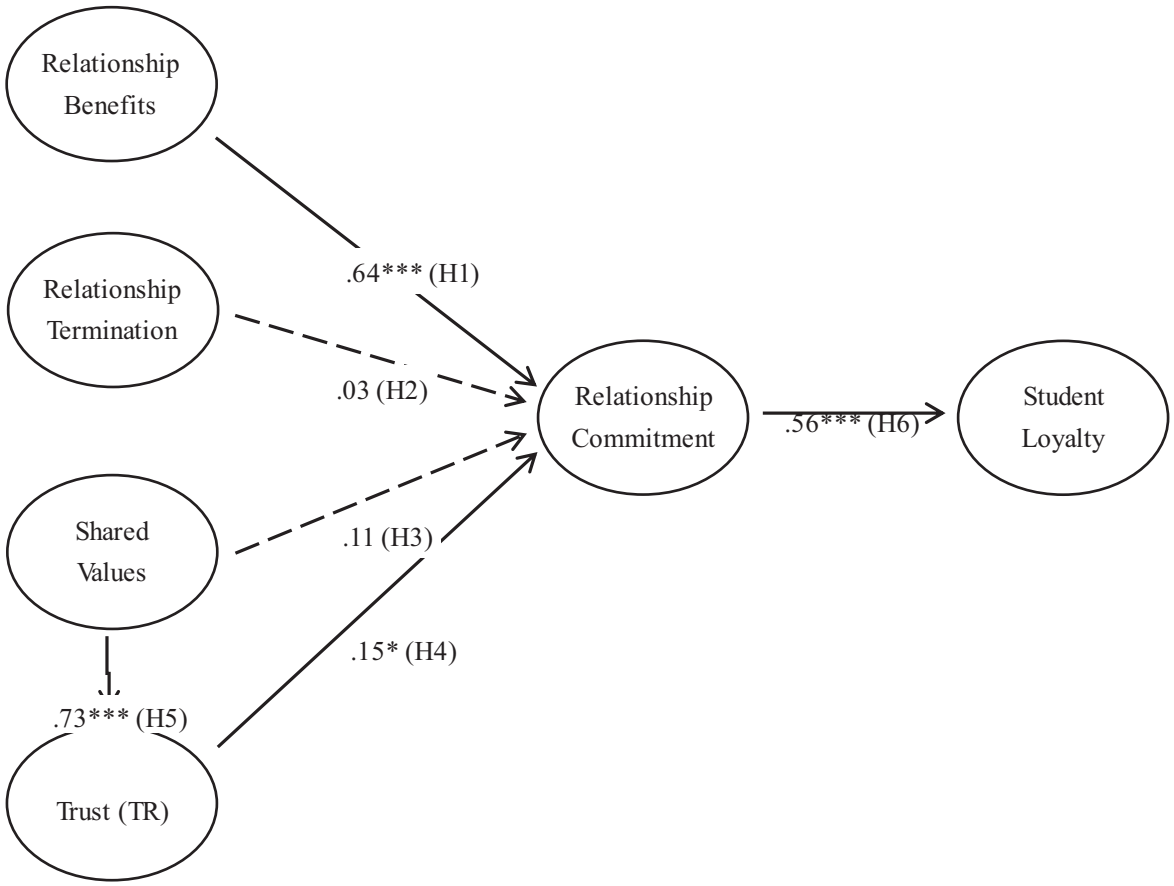

Figure 2. For HKDSE

*$p < .05$. **$p < .01$. ***$p < .001$.

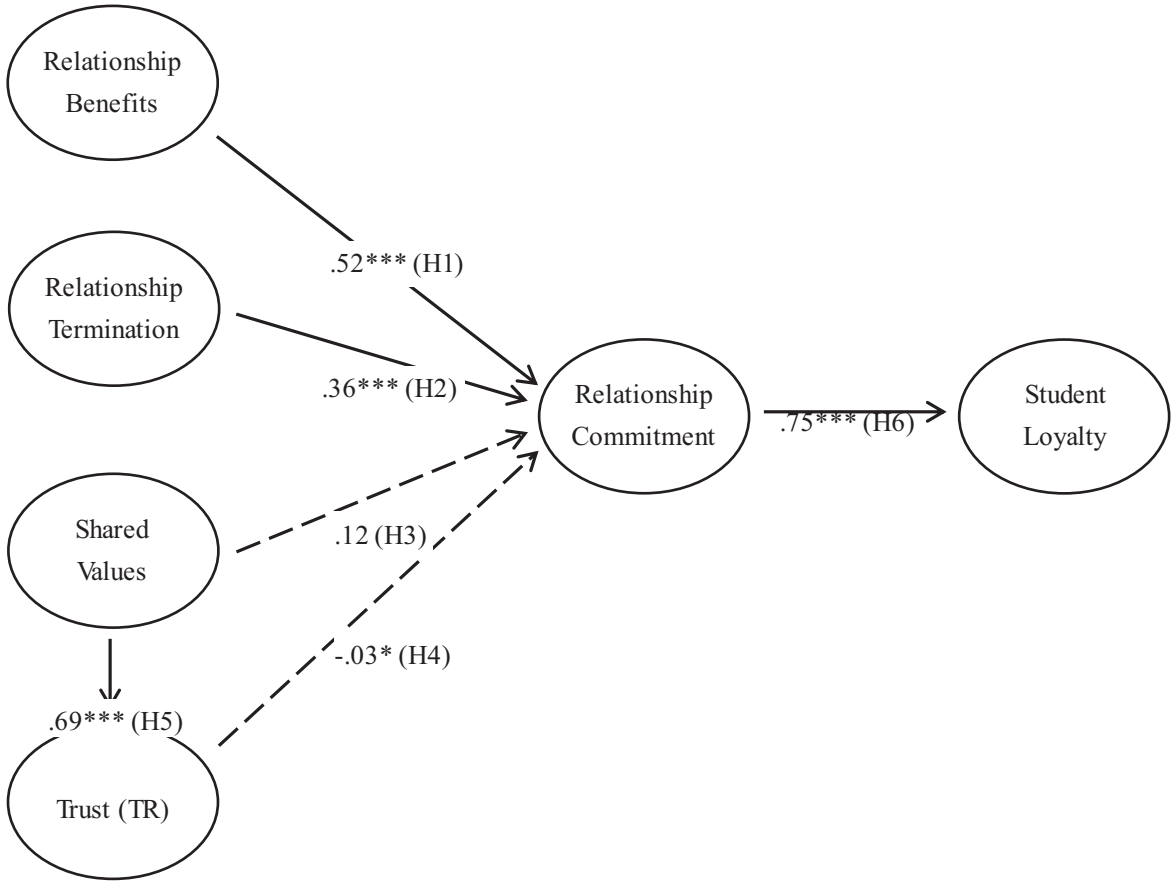

Figure 3. For HKALE

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

4. Discussions

The overall structural model is supported by empirical data. Most of the hypothesized relationships are supported. Consistent with many previous studies (Ou et al., 2014; Fullerton, 2014; Caceres and Paparoidamis, 2007; Adidam et al., 2004; Morgan and Hunt, 1994), the result of this study also indicated that there is a positive relationship between relationship commitment and loyalty which was characterized as repurchase intention in this study. Therefore, PTE providers should try to build relationship commitment among students in order to enhance student loyalty.

The finding of this study was also consistent with previous studies (Dagger et al., 2011; Tanford et al., 2010; Adidam et al., 2004; Park and Him, 2003) that relationship benefits characterized as superior quality of services relative to other suppliers have a positive influence on relationship commitment. The construct of relationship benefits is a significant determinant of relationship commitment; PTE providers may consider enhance their benefits provided to students in order to increase students' commitment to schools.

Consistent with previous studies (Afsar et al., 2010; Rodriguez and Wilson, 2002; Morgan and Hunt, 1994), the result of this research indicated that trust is found to have a positive influence on relationship commitment. Trust which was characterized as having confidence in partners' reliability and integrity is a determinant of relationship commitment in this study, however, the positive influence of trust is not as strong as relationship benefits in the PTE context.

Unlike the common findings in relationship marketing literature that relationship termination costs and shared values are determinants of relationship commitment, the direct effects of relationship termination costs and shared values on relationship commitment are found to be insignificant in this study. Relationship termination costs comprised of both economic and non-economic nature in this study; while similar values were characterized as values shared by partners about appropriate behaviors, goals and policies. The result provides new insights to PTE sector. The findings are not surprising because the HKDSE graduates are younger and they are being taken good care by their parents, they do not need to worry too much about economic or non-economic

issues. Moreover, they care more about whether they have a place to study and not about whether they have similar views or values with schools.

Considering all the four factors (relationship benefits, relationship termination costs, shared values, and trust) affecting relationship commitment, the R^2 0.631 indicates that 63.1% of the variance of relationship commitment is explained by these four factors in the proposed model. However, relationship termination costs and shared values may play non-significant roles in determining relationship commitment in PTE with HKDSE graduates. Among the four factors, private tertiary institutions' students may consider relationship benefits as the most important factor when forming commitment to their schools.

Similar to previous studies (Adidam et al., 2004; Morgan and Hunt, 1994), this research showed that shared values have positive influence on trust. The high R^2 0.533 indicates that 53.3% of the variance of trust is explained by shared values in the proposed model.

5. Contributions and Future Research

This research has both theoretical and managerial contributions. The results of this research confirm that relationship commitment has positive influence on loyalty, and relationship benefits and trust have positive influence on relationship commitment, in PTE context with HKDSE graduates. The rejection of predictive effect from relationship termination costs and shared values on relationship commitment in private education sector provides new angle to the application of relationship marketing in eastern education setting.

Education providers have to put a focus on enhancing relationship commitment in order to increase student loyalty. They can also use the results of the path analysis to understand the preferences of their students and allocate resources properly to enhance the factors that affect relationship commitment which, in turn, enhances loyalty. As the result of this study indicates that relationship benefits is the most influential determinants of relationship commitment in PTE industry, education providers should devote more resources to provide better benefits, such as internship and exchange opportunities, professional seminars and workshops, education quality, campus facilities, student activities, to students in order to build relationship commitment. The results also provide insights to different divisions or disciplines for allocating resources in building relationship commitment.

Due to time constraint, a cross-sectional study was conducted, which was difficult to take into account of the actual behavior of respondents. Furthermore, the sample was drawn from only one PTE provider the result might not be able to be generalized for the whole industry. Besides, measurement scales of this study were adopted from previous studies of other contexts, the adopted scales might not be as effective as tailor-made scales for a specific context.

In future, to enhance generalizability of the findings, the study can be extended to other PTE institutions. Longitudinal study can be conducted to have a better understanding of students' actual behavior. Future study can also consider developing measurement scales for education in eastern context which may help management of PTE to have better decision making. If the findings of similar study on HKALE graduates are available, a comparison of the findings between HKALE and HKDSE graduates would be interesting.

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Earnings Management to Avoid Financial Distress and Improve Profitability: Evidence from Jordan

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Abstract

Due to unstable economic and political conditions, many companies in the Middle East are undergoing various financial distress and decline in profitability. This paper examines the role of earnings management to avoid financial distress and improve profitability in 58 industrial corporations listed on Amman Stock Exchange for a period of 2011 to 2016, which constitutes 89% of the whole population. The total number of observations is 413 for the entire study period. The study uses a cross-sectional Jones model that was modified by (Kothari, Leone, and Wasley, 2005); to measuring discretionary accruals that used as a proxy for earnings management.

The empirical results indicate that earning management is not affected by the Altman's Z-score index, but it has a positive relationship with debt to equity ratio. This study also shows a positive relationship between earnings per share, returns on equity, and earnings management. Regarding the control variable, we found a negative relationship between cash flow from operation and discretionary accruals.

Keywords: Altman's Z-Score, discretionary accruals, earnings management, financial distress, Jones Model, industrial sector, profitability

1. Introduction

Earnings management is one of the most important topics that have attracted great interest in business administrative science research because of the negative effects that result from it, like issuing financial reports in ways to mislead the various economic decision makers (Jaggi & Tsui, 2007). Previous studies dealt with earnings management in several aspects, the most important of them include measuring, motivation, and its use as a means to mitigate the effects of financial crises on companies' earnings declines and market values.

Interest in earnings management increased after the global financial crisis in 2007 (Al Zoubi & Selamat, 2012). In regards to earnings management, a lot of companies found the simplest method to avoid financial crises effects and earning decline. Consequently, Jordan is one of the many countries that have been negatively affected by this crisis. This is in addition to the poor economic conditions in the Middle East, especially Jordan, as a result of wars and conflicts within the countries of the region, which led to a decrease in exports and trade exchange between Jordan and neighboring countries due to the closure of most of the border crossings between them. Therefore, this had a negative effect on most of the industrial sectors, including Jordanian industrial corporations.

The aim of this study is to measure the earnings management firstly by using the most widely used methods, which are discretionary accruals. This study also aims to ascertain their role in reducing the impact of financial distress faced by companies as well as improve profitability.

2. Literature Review and Hypotheses Development

2.1 Earnings Management

Different studies considered earnings management as one of the most crucial ethical financial reporting issues, which accountants confront in everyday practices around the world (Armstrong, 1993). This, however, was such that there is no uniform definition agreed upon in previous studies because there are different incentives, motivation, and measures for earnings management. Based on the study of Healy and Wahlen (1999), earnings

management occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depends on reported accounting numbers. Furthermore, Schipper (1989) defined earnings management as a way of using opportunities provided by the accounting system to engage earnings by adopting accounting methods for a specific purpose. It is noted that the previous definitions are the most cited definitions in previous studies, and it focuses on the existence of certain methods followed by the management to affect the accounting numbers to achieve specific purpose.

Furthermore, Beneish (2001) argued that there are two perspectives on earnings management; the opportunistic perspective which states that managers seek to mislead investors and the information perspective. Likewise, Alsharairi (2012) defined earnings management as the managerial practices, in accordance with GAAP, that are aimed at influencing the accrual component of the reported earnings upwards (i.e. reporting positive abnormal accruals) or downwards (i.e. reporting negative abnormal accruals), motivated by the associated informational implications and the economic consequences. In addition, (Rahman, Moniruzzaman,, and Sharif, 2013) stated that earnings management are accounting policies or the accruals control, chosen by the management of enterprises to make the earnings reach the expected level under the pressure from the relevant stakeholders and the constraints of generally accepted accounting principles (GAAP).

Based on the above review, this study defines earnings management as managerial practices that focus on intentional intervention in the measurement and financial presentation, in line with accounting standards to influence accounting income, whether to increase or decrease or to maintain at certain levels, in order to achieve a specific purpose. Nevertheless, managers mainly engage in earnings management because of the following types of incentives (Healy & Wahlen, 1999):

1-Contractual Incentives

- Management Compensation Contract: Management compensation contract can encourage managers to engage in earnings management to increase their compensation bonus awards.

- Debt Contracts: Accounting numbers are used in debt contracts as a measure to meet the contract requirements; also, managers can alter accounting numbers by earnings management to meet those requirements.

2- Regulatory Incentives

One of the most common kinds of regulatory incentives is related to anti-trust considerations. Some companies decrease earnings in order to minimize political costs associated with being seen as too profitable; also, there are other kinds of regulatory incentives like industry-specific regulations and tax considerations.

3- Capital Market Motivations

Managers have strong incentives to manage earnings to be qualified for stock right issues and in obtaining high share price in the market.

According to Mohanram (2003), there are two methods used in literature to detect earnings management. The first one depends on qualitative accounting analysis through identifying what are the key accounting policies for a given firm and industry, assessing a firm's accounting flexibility, evaluation of a firm's accounting strategy, evaluation of the firm's quality of disclosure, providing a representative list of potential red-flags in accounting, and finally by undoing accounting distortions by reversing the impacts of dubious accounting choices wherever possible. The second method depends on analyzing accruals.

Accruals are divided into normal accruals which depends on the nature of operation like credit policy and credit terms granted to customers. On the other hand, abnormal accruals depends on the management choice over which they influence their discretionary powers while reporting the income numbers (Debnath, 2017). Discretionary accruals are adjustment to cash flow based on subjective choice exercised by the management which is used as a proxy for measuring earnings (Dechow, Sloan, and Sweeney, 1995) (Healy & Wahlen, 1999).

2.2 Financial Distress and Earnings Management

Financial distress refers to a firm's inability to meet its obligations due to poor cash flows and profitability (Nagar & Sten, 2016). However, Managers during financial distress have incentives to manage earnings to obtain the necessary financing (Rosner & University, 2003), reduce the incidence of bankruptcy (Frost, 1997), avoid violation of debt covenants (Jaggi & Lee, 2002), and provide highly optimistic forecasts.

Several proxies for financial distress are used in literatures, Bartov (1993) used Debt/Equity ratio as a proxy for distress. Also, (Callen, Robb, and Segal, 2008) focus on losses occur during a number of years surrounding specific year, while other studies like Jaggi and Lee (2002) focus on the violation of debt covenants. Bernsten

and Wild (1998) and Nagar and Sten (2016) show that Altman's Z-score is the most recognized model of financial distress which uses multiple ratios to generate a prediction of distress. A firm-year is considered as distressed if its Z-Score is less than 1.20 in year t-1. Thus, Z-Score is computed as follows:

$$Z = 0.717X1 + 0.847X2 + 3.107X3 + 0.420X4 + 0.998X5 \quad (1)$$

Where, X1 = Working Capital / Total Assets; X2 = Retained Earnings / Total Assets; X3 = Earnings before Interest and Taxes / Total Assets; X4 = Market Value of Equity / Total Liabilities; X5 = Net Sales/ Total Assets.

Different literatures have investigated the relationship between earnings management and financial distress. DeFond and Jiambalvo (1994) found that in the preceding period of debt covenant violations occur, company deliberately increases income to avoid violations. Consequently, Charitou, Lambertides, and Trigeorgis (2007) found that companies facing bankruptcy are going to increase income through accruals. Garcia Lara, Osma, and Neophytou (2009) found that in the four years prior to failure, the companies studied are going to increase accruals. Here, some studies, such as Yang, Chun, and Ramadili, (2009) and Omid (2012), use Debt/Equity ratio as a proxy for distress and found a positive relationship between this ratio and earning management. Therefore, this means that companies that maintain high debt ratios tend to practice earnings management using accruals to meet the terms of their joint debt agreements.

Zang (2012) use Altman's Z-Score as a proxy for distress and found that firms in distress use more of accruals earnings management and less of real earnings management. In addition, Nagar and Sen (2016) use Altman's Z-Score as a proxy for distress and found that companies at the beginning of exposure to financial distress engage in real earnings management through a reduction some expenses like selling and administrative expenses, to increase profitability and liquidity. When distress intensifies, the company tends to engage in income-increasing accruals management. On the other hand, Joosten (2012) found no relationship between earnings management and Altman's Z-Score due to the difficulty of calculating such proxy and the lack of use by economic decision makers when making their decisions.

Based on the previous review of the relationship between earnings management and financial distress, the following hypotheses can be formulated.

HO1: There is no significant relationship between Altman"s Z-Score and Earnings Management.

HO2: There is no significant relationship between Debt/Equity ratio and Earnings Management.

2.3 Improved Profitability and Earnings Management

As previously mentioned in this study, there are many incentives to practice the earnings management and one of these is to influence accounting income. This, therefore, can be done by increasing, decreasing, or maintaining certain levels in order to achieve specific purpose. DeFond and Park (1997) discovered that firms tend to smoothen earnings in order to distribution of profits realized in the current period over future periods to be consistent with investors' preference for stable income through time. Beatty, Bin, and Kathy (2002) found that companies are involved earnings management to avoid small earnings losses or decreases. Also, Hamdi and Ali Zarai (2012) found that Islamic banks manage earnings to avoid reporting losses and earnings decreases.

Different literatures investigate the relationship between earnings management and financial indicators that measure the volume of earnings. Al-Fayoumi, Abuzayed, and Alexander (2010) and Abu_Risha, Mohammad, & Mohammad (2015) found a positive statistical relationship between earnings management and returns on equity in Jordanian Industrial Corporation. Also, Shaglof (2009) identified a positive statistical relationship between earnings management and earnings per share.

Based on the previous review of the relationship between earnings management and support profitability, the following hypotheses can be formulated.

HO3: There is no significant relationship between return on equity and Earnings Management.

HO4: There is no significant relationship between earning per share and Earnings Management.

3. Methodology

3.1 Sample Selection

The study population consists of all the industrial corporations listed on Amman Stock Exchange, which are equal to 65 companies according to the Jordanian company's guide of 2016. The sample of the study included all industrial corporations listed on Amman Stock Exchange after excluding the following companies:

1. Companies that have been liquidated or merged during the period 2011-2016.

2. Companies that did not publish their financial statements regularly during the period 2011-2016.

Therefore, the final sample size that met the previous conditions was 58 companies, which constitutes 89% of the population. Seven companies (11%) were excluded from the size of population due to the above conditions. The total number of observations is 413 for the entire study period.

3.2 Variable Measurement and Research Model

3.2.1 Measuring Earnings Management (Dependent Variable)

Based on previous literatures, we use discretionary accruals as a measure of earnings management. Discretionary accruals are estimated using Jones model (1991) and the modified Jones model tested by (Dechow et al., 1995. Thus, these models are commonly used by most researchers; (Dechow et al., 1995; Young, 1999; Be´dard, Sonda, and Lucie, 2004). Furthermore, recently, some researchers have argued that it is important to consider the performance of the company in the past when measuring earnings management. Therefore, some studies (Dechow, Kothari, Watts, 1998; Barth, Cram, and Nelson, 2001) have attempted to develop measurement models that take into account the performance of the company. Kothari et al. (2005) is one of the most important studies that dealt with this aspect in details. The performance of the company was measured using the return on assets ratio, which was introduced on the modified Jones model 1995 to develop a new model called "Performance Matched Modified Jones Model", which was later used by some researchers (Gong, Louis, and Sun., 2008; Ghosh, Marra, and Moon, 2010; Louis & sun, 2011; Abu_risha et al., 2015).

The following cross-sectional regression model developed by Jones (1991) was first modified by Dechow et al. (1995). After then, it was modified by Kothari et al. (2005):

$$TACC_{i,t}/\ TA_{i,t-1} = \alpha_1(1/TA_{i,t-1}) + \alpha_2(\Delta REV_{i,t} - \Delta REC_{i,t}/TA_{i,t-1}) + \alpha_3(PPE_{i,t}/TA_{i,t-1}) + \alpha_4 ROA_{i,t-1} + \varepsilon \quad (2)$$

where, $TACC_{it}$ is the total accruals for firm i in year t, $TA_{i,t-1}$ is total assets for firm i in year t-1, ΔREV_{it} is measured by revenues in year t and less revenues in year t-1 for firm i, ΔREC_{it} is measured by receivables in year t and less receivables in year t-1 for firm i, PPE_{it} is the gross property, plant, and equipment for firm i in year t and $ROA_{i,t-1}$ is the return on assets for firm i in year t-1. Total accruals are calculated by deducting the cash flows from operations from net income. In order to find discretionary accruals, we first calculated all non-discretionary accruals (NDTACC) as follows:

$$NDTACC_{i,t}/\ TA_{i,t-1} = \hat{a}_1(1/TA_{i,t-1}) + \hat{a}_2(\Delta REV_{i,t} - \Delta REC_{i,t}/TA_{i,t-1}) + \hat{a}_3(PPE_{i,t}/TA_{i,t-1}) + \hat{a}_4 ROA_{i,t-1} + \varepsilon \quad (3)$$

Finally, we calculated discretionary accruals (DACC) as a proxy for earnings management by deducting the non-discretionary accruals from total accruals.

3.2.2 Independent Variable

In order to analyze the role of earnings management to avoid financial distress faced by companies and support profitability, we use Altman's Z-Score and debt to equity ratio as a proxy for financial distress. Furthermore, we also use return on equity and earnings per share as a proxy for profitability. Table 1 represents the study variables:

Table 1. Independent and Control Variables

Variable Name	Definition
Independent Variable:	
Z-Score (Z.S)	Altman"s Z-Score, which uses multiple ratios to generate a prediction of distress. Zang (2012), Nagar and Sten (2016).
Debt to Equity (D/E)	Total debt divided on total equity. Yang et al. (2009) and Omid (2012)
Return on Equity (ROE)	Net income before interest and tax divided on average common shareholder equity. Al_Fayoumi et al. (2010) and Abu_risha et al. (2015)
Earnings Per Share (EPS)	Net income divided on weighted average of share outstanding. Shaglof (2009)
Control Variable:	
Cash Flow from Operation (CFO/TA)	Cash flow from operation tagged to total assets. Abdul Rauf, Johari, Buniamin, and Abd Rahman (2012), Sukeecheep, Yarram, and Al Farooque (2013) and Abu_risha et al.(2015)

3.2.3 Empirical Models

To test the study hypothesis and investigate the relationship between earnings management and financial distress, controlling the impact of other relevant variables is estimated using the following OLS regression:

Model 1

$$DACC= \alpha_0+ \beta_1 Z.S_{i,t}+\beta_2 D/E_{i,t}+\beta_3 CFO/TA_{i,t} + \varepsilon \quad (4)$$

The relationship between earning management and profitability, and in controlling the impact of other relevant variables is estimated using the following OLS regression:

Model 2

$$DACC= \alpha_0+ \beta_1 ROE_{i,t}+\beta_2 EPS_{i,t}+\beta_3 CFO/TA_{i,t} + \varepsilon \quad (5)$$

4. Empirical Results

This section provides the findings and interpretations that resulted from various statistical methods used in data analyses.

4.1 Descriptive Statistics

The descriptive statistics for all study variables are presented in Table 2, which shows that the mean of discretionary accruals are positive (0.0068). This means that Jordanian industrial corporations engage in income-increasing earnings management, followed by very low standard deviation (0.1117). Furthermore, the mean value of Altman's Z-Score of the sample firms is positive (3.2197) and greater than 1.20 which means that sample firms are on an average not classified as distressed firms. There is also a wide range of difference that exists between sample firms because the standard deviation is high (7.5493). Also, it should be noted that the mean of debt to equity ratio is equal (35.7326%), which means that the long term debt represents 35.7326% of the total equity that is followed by a very high standard deviation (24.9692). This implies that the Debt to Equity ratio varies widely across the sample firm. Finally, there are indications of a decrease in the profitability of the sample firms during the study period where the mean value of return on equity and earning per share are very low, (-2.1546) and (0.0838) respectively.

Table 2. Descriptive Statistics

Variable	Obs	Mean	Std.Dev
DACC	348	0.0068	0.1117
Z.S	348	3.2197	7.5493
D/*E*	348	35.7326	24.9692
ROE	348	-2.1546	39.6557
EPS	348	0.0838	0.4465
CFO/TA	348	0.0397	0.11759

4.2 Multicollinearity

Table 3 presents the correlation analysis for all variables that form the first regression model. Therefore, this indicates that the correlation between the variables is small, within the range of .005 and -.664. This indicates that there is no linear correlation problem in the first study model because Pearson's correlation for all variables is less than 80% (Gujarati, 2003).

Table 3. Correlation Matrix for the first model

Variable	DACC	Z.S	D/E	CFO/TA
DACC	1			
Z.S	-.087	1		
D/E	.005	-.226	1	
CFO/TA	-.664	. .090	-.123	1

Table 4 presents the correlation analysis for all variables that form the second regression model. Therefore, this indicates that the correlation between the variables is small, within the range of .019 and -.664.

Table 4. Correlation Matrix for the second model

Variable	DACC	ROE	EPS	CFO/TA
DACC	1			
ROE	.019	1		
EPS	.141	.297	1	
CFO/TA	-.664	.251	.380	1

4.3 Regression Results

Table 5 reports the results of regression analysis for model (1), which examines the association between earning management and the two proxies of the financial distress (Altman's Z-Score, and Debt to Equity ratio).

In this Model which depends on time series data, the Durbin-Watson test equal (1.436). It is close to number (2), which means that the autocorrelation problem is not present in regression model. Thus, this is because if the result of this test is closed to the number (2), the less the strength of the autocorrelation within the regression model (Gujarati, 2003). Also, F-statistic value equal (93.49) with a P-value of 0.00, which indicates fitness and statistical significance of the model. The Adjusted R-square is equal (0.444) which indicate that all the explanatory variables in the model jointly explain the extent of 44.4 per cent variation in the discretionary accruals. We also note from the table that there is no significant relationship between Altman's Z-Score and Earnings management. Thus, this means that the value of the Z-Score don't motivate the Jordanian industrial corporations to earnings management, especially if we know the mean of this indicator for the study sample was) 3.2197) (previously mentioned in Table 2). Hence, this is higher than (1.20), which is the limit of the probability of discontinuity. Also, this result contradicts many of the prior literatures like the study of Joosten (2012) who stated that there is no significant relationship between Altman's Z-Score and earnings management. The regression analysis also shows that debt to equity ratio and discretionary accruals are positively related. This means that companies that maintain high debt ratios tend to practice earnings management using accruals to meet the terms of their joint debt agreements (Yang et al., 2009; Omid, 2012).

Regarding the control variable, we found a negative relationship between cash flow from operation and discretionary accruals. This means that companies that have low cash flow tend to practice earnings management using accruals to hide the liquidity problems. Thus, this result confirms the findings of Abdul Rauf et al. (2012) and Sukeecheep et al. (2013).

Table 5. Regression Analysis for Model 1

Independents Variables	Coefficients	T	Sig
Z.S	-.047	-1.133	.258
D/E	.089	2.149	.032
CFO/TA	-.671	-16.602	.000
F. Value 93.49	**Sig 0.00**		
Durbin-Watson 1.436			
R Square 0.449			
Adjusted R Square 0.444			

Table 6 reports the results of regression analysis for model (2), which examines the association between earning management and the two proxies of the profitability (returns on equity and earning per share).

In this Model which depends on time series data, the Durbin-Watson test equal (1.609). This means that the autocorrelation problem is not present in the regression model. Also, F-statistic value equal (196.36) with a P-value of 0.00 indicates fitness and statistical significance of the model. The Adjusted R-square is equal (0.628) which indicate that all the explanatory variables in the model jointly explain the extent of 0.628 per cent variation in the discretionary accruals.

The results of the study showed a positive relationship between profitability proxies and discretionary accruals. However, this indicates that the management of the Jordanian industrial corporations uses earnings management to increase earnings per share and returns on equity. This is because these indicators have a great importance to current and future investors and related parties. Also, we found a negative relationship between cash flow from operation and discretionary accruals. This result consists of the result found in model number (1).

Table 6. Regression Analysis for Model 2

Independents Variables	Coefficients	T	Sig
ROE	.105	3.033	.003
EPS	.434	11.960	.000
CFO/TA	-.855	-23.875	.000
F. Value 196.36	**Sig 0.000**		
Durbin-Watson 1.609			
R Square 0.631			
Adjusted R Square 0.628			

5. Conclusion

This study is focused on investigating the impact of financial distress and profitability proxies on earnings management in industrial corporations listed on Amman Stock Exchange for a period of 2011 to 2016. The empirical results provide evidence that earnings management is not affected by the Altman's Z-Score index, but it has a positive relationship with debt to equity ratio. Our findings provide insights into how managers of distressed firms can avoid some of the negative effects of financial distress by engaging in earning management. Furthermore, the results provide evidence of a positive relationship between earnings per share, returns on equity, and discretionary accruals. This indicates that industrial corporations are more committed to managing a positive earning.

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What Determines the Profitability of Vietnam Commercial Banks?

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Abstract

Kunt and Detragiache (1999) said that the profitability of the banking system was a good indication in signaling financial crisis. Therefore, studying determinants of bank profitability is necessary for better understanding of the current condition of the banking sector, and then, for launching new policies. The research explored determinants of Vietnamese commercial banks' profitability. Using Regression Analysis for Panel Data set of 13 Vietnamese commercial banks over the period from 2006 to 2015, the study found that foreign ownership, cost to income and the level of credit risk, negatively influenced on the profitability of Vietnamese banks, whereas state ownership, size of assets, and macroeconomic factors (GDP and inflation) did not indicated statistically significant relations to the profitability and the relationships between capital structure, liquidity risk and the profitability were mixed.

Keywords: ROE, ROA, bank profitability, risk management, ownership structure

1. Introduction

The severe impacts of financial crisis and global economic downturn, which the weakness in banking system takes the significant blame for, are still being felt until now and lessons are always being valued. The robustness of the banking sector is an essential condition to ensure the financial stability, because banking is the key element in financial system and plays an important role for economic development. In order to improve banking performance, the prerequisite is to understand the factors that affect their operation results. Examining those affecting factors has not only attracted attentions from scholars, but also from shareholders, managers and authorities, because it helps policy-makers and administrators in formulating adequate strategies and policies to ensure the sustainability and stability in the banking system, thereby avoiding risks of financial crises. Assessing the performance of commercial banks is not easy, because of their diversity. Many researchers have identified that banking profitability may bring an overall picture on banking performance.

Vietnam has bank-based financial market, which is dominated by banks. Vietnam commercial banks become the most important factor in the financial system. However, a number of weaknesses of banks, such as high non-performing loans, unstable liquidity, cross-ownership, poor governance, negatively impacted the performance of banks. The objectives of the paper are to test the influence of internal and external factors on the profitability of Vietnamese commercial banks over the period from 2006 to 2015, from which, to identify statistically most significant factors on the profitability of Vietnamese banks. More particularly, the paper aims are as followed:

- To analyze and evaluate the influence of micro factors on the profitability of Vietnamese commercial banks.

- To analyze and evaluate the influence of macro factors on the profitability of Vietnamese commercial banks.

- To identify whether bank-specific factors and macroeconomic factor significantly influence on the profitability of Vietnamese commercial banks.

2. Literature Review

Evaluating business results of a commercial bank as well as determining the factors affecting them is one of the research areas attracting a lot of attention of not only scholars but also shareholders, managers and management body authorities. There are different available approaches to assess the performance of a commercial bank, for example, using analytical limit operation methods or selecting evaluation results for each aspect such as profitability, level of risk, the ability of management, competitiveness, However authors chose the approach based on the evaluation of the profitability of banks. Profit maximization would probably be one the most

commonly cited goal to all business, hence, in commercial banks, evaluating performance is to look at achieved profit level of each bank subjected to their targeted profit. Assessing the profitability of commercial banks is not just the banks consider how to make profit, less or more than other banks? One bank generated higher profit margin than others would not be necessarily good if that bank accepted higher levels of risk instead improving asset quality or cost management. So, besides looking at the profitability of banks, we also need to assess the level of risk they are exposed to. Measuring bank profitability is important not only for bank itself, but also for the supervisory authorities to ensure financial stability.

Ownership structure

The notion that the ownership structure is one of the determinants of business results of the company has received much attention from economists and finances. Berle and Means (1932) study is credited with laying the important foundation of these issues. They said that a dispersed ownership structure was inversely proportional to the business results of the company. This was due to the differences in managers and shareholders goal. The relationship between ownership structure and business results of the bank has also received attention from researchers recently. According Gürsoy and Aydogan (2002), the impact of ownership structure on the activities of the bank is seen under two aspects: (1) the degree of concentration of ownership, and (2) form of ownership. In term of the degree of concentration of ownership, banks are divided into two categories: centralized and distributed property ownership. In terms of form of ownership, banks are divided into state-owned commercial banks, private banks and foreign banks.

Capital Structure

According to the theory of corporate governance, financial leverage reduces agency cost created by discretionary expense of managers, thereby affecting the business results of enterprises. Agency cost, due to conflicts of interest between shareholders and management, is the important issue in both financial sector and non – financial sector business operation. This theory said that the selection of appropriate capital structure could reduce the agency cost, according to Jensen and Mekling (1976), the debt can be used to promote the company's management board. The relationship between capital structure and operating results of banks were examined in many studies. Holding the proportion of high equity is costly for banks due to the benefits from debt. According to Modigliani and Miller (1958), investors will expect a higher returns as a higher leverage ratio. This theory is also applicable to the banking sector. Therefore, the bank also has an optimal capital structure which allows it to maximize the value (Berger et al, 1995). However, in view of the balance theory, holding more capital might reduce the risk as well as the risk premium that be require to offset the cost of default by investors (Allen et al, 2011). Banks with a high proportion of capital held would be more likely to survive in the future, and would have a larger motivation in monitoring the borrower, so investors can consider this matter when they look at yield of returns. Bourke (1989) had suggested that the equity ratios which hold by bank had a positive correlation with profitability, because banks had greater equity ratio can easily access to cheap capital and had less risk.

Risk management

The activities of commercial banks have separate characteristics and profit based on the risk management capabilities of their activities. The impact of risk management systems to the profitability of commercial banks is reflected in the ability of commercial banks to identify and build a reasonable risk appetite. This level of risk appetite will influence and guide all business activities and investments of commercial banks. International audit organizations Earn and Young have pointed out that one of the main reasons causing many banks around the world to suffer severely during the global financial crisis period from 2007 to 2009 is they did not identify and build a reasonable risk appetite. Similarly, KPMG also said that the clear definition of the risk appetite would not only help the commercial banks to control and reduce risk but also be an effective tool to improve the profitability of commercial bank. Nicolae Petria and colleagues also pointed out, effective management of credit risk and liquidity risk will positively affect the performance of banks, in particular increasing ROE.

More specifically, the risk management capabilities of banks are determined by the type of risk that banks faced. According to De Young and Roland (2001), the liquidity risk management capabilities of a commercial bank would ensure the necessary funding to meet the requirements of lenders and bank investment, which helps the commercial banks take advantage of the opportunity to generate the highest level of profitability. Bordeleau and Graham (2010) by using experimental studies for a number of large commercial banks of the Commercial US and Canada have found a same direction correlation between the profit of the commercial bank and the holding of a reasonable level of assets with high liquidity. However, the concept of a reasonable level of highly liquid assets holding depends on the business model that commercial banks selected and the economy status. Besides, the most obvious impact to the profitability of commercial banks is their possibility in credit risk management.

Titus.M.Mboka (2013) said that an efficient credit risk management model would help commercial banks to increase profitability stably through reducing losses in the credit business and increasing market share. However, some quantitive studies showed that the level of credit risk high banking helps banks achieve better profit margins (Kithinj, 2010 and Boahene et al, 2012). This was explained as follows: the customers who were perceived as riskier need to pay higher interest rate, so banks would have higher incomes. Besides monitor closely after bank lending help minimize risk of banks' capital losses.

Total assets

Emery (1971) and Vernon (1971) was one of the first scholars have studied the relationship between asset size and profitability of the bank. Emery (1971) had found that large banks will earn more profit. Short (1979), Biker and Hu (2002) by qualitative studies have found positive relationships between two variables, because the big banks have had the advantages in the mobilization of resources cheaper capital, thereby reducing the cost of business. Pasiouras and Kosmidou (2007) also made similar statements, to say that the big banks can have the better diversification and higher production efficiency than small banks. However, Vernon (1971) did not find the meaning of this relationship. This also coincides with the findings of Heggested (1977), Kwast and Rose (1982). Stiroh and Rumble (2006) suggested that this relationship (between bank size and rate of return) was inverse, the larger banks' scale were, the more difficult to manage. Especially, when banks increase the scale to expand horizontally, it would increase costs, not to bring high efficiency. Besides the cost of administrative procedures, staff costs, fixed costs also increased substantially. Like Stiroh and Rumble, Kasman (2010) analyzed data from 431 banks in 39 countries and found the conclusion of the inverse relationship between the scale of bank and its net interest income margin (NIM). Ben Naceur and Goaied (2010) also agreed with this view when conducting research on banks Tunisis.

The economic cycle

Understanding the relationship between the fluctuations of the business cycle and the profitability of banks plays an important role in assessing the stability and soundness of the banking system and financial system (Saunders and Schumacher, 2000, Biker and Metzemakers, 2003). One of the first studies on the relationship between the profitability of the banks with the macro elements are made by Molyneux and Thomson (1992). They suggested that economic growth was the most important factor affecting the profitability of banks. Many studies then also indicated that the profitability of the banking business is heavily influenced by economic cycles (Laker (1999), Calza et al, 2006)

Inflation rate

Boyd and colleagues (2000) had studied the impact of inflation on the efficiency of financial markets in more than 100 countries in the period from 1960 to 1995, found that, with low inflation, there was a negative correlation between inflation and credit to the private sector and the bank's assets.

Kunt and Huizinga (1999) in their study found the same dimensional relationship between inflation and the profitability of banks, due to the bank's earnings rose faster than their costs. High Inflation is associated with higher realized interest margins and greater profitability. Banks also benefited from the slow disbursement for customers in terms of high inflation. However, several other studies have questioned the governance costs as inflation increases. Ravell (1979) said that the impact of inflation on the bank's profitability depends on the growth rate of operating expenses (salaries and other expenses) compared to inflation. Perry (1992) argues the same point about the inflationary impacting the profitability of banks depending on expected inflation. If the bank executives predicted the correct rate of inflation, they will adjust interest rates reasonably, the revenue would increase faster than costs, leading to the bank earned more profit. If the prediction is incorrect, the bank will adjust interest rates slow, costs rise faster than income, leading to adverse effects in profitability(Kunt and Huizinga, 1999 and Abreu and Mendes, 2000).

3. Research Methodology

3.1 Variable Selection

3.1.1 Dependent Variables

In most of research about the profitability of commercial banks in all over the world, the proxy for profitability of commercial banks is often ROE (Goddard et al., 2014) and ROA (Athanasoglou et al., 2008). Besides, Kun et al. (1999) used NIM to measure the performance of banks.

ROA, which stands for return on total assets, is the most common ratio used in research of profitability of banks (such as study by Pasiouras et al., 2007, Goddard et al., 2004). ROA showed the result of assets investment, and

more importantly, demonstrated the capabilities of senior executives in the use of financial resources to make profit (Hassan et al., 2003). For each bank, ROA depends on its strategic decisions of the bank and is also influenced by economic factors which the bank cannot control. Rivard et al. (1997) argued that ROA is the best indicator to measure the profitability of banks. Besides, ROA is also the best measure of the ability to generate income of the total assets of the bank. However, the use of ROA faces some limitations, such as ROA excluding off-balance-sheet activities, profit of which was cumulative with the profit of the bank whereas the denominator excluded those items.

ROE, which stands for return on equity, shows the ability to generate profits and added value to shareholders. ROE is considered one of the most comprehensive indicators to evaluate the profitability of commercial banks, because, the ultimate goal of a bank is generally assumed to maximize net assets value, thereby, creating added value for shareholders.

Furthermore, some other empirical studies suggested to use NIM (Net Interest Margin) to measure the profitability of commercial banks. This was because for the majority of commercial banks, net interest income usually accounted for the largest proportion. Thus, for a bank with high net interest margin, its ROA and ROE were usually higher than those of other banks.

With advantages and disadvantages of all of three measures, this research used all of the three variables ROA, ROE, NIM as dependent variables as proxies for profitability of bank.

3.1.2 Independent Variables

According to previous literature, these variables are divided into two categories: bank-specific variables and macroeconomic variables (Molyneux et al., 1992; Pasiouras et al., 2007; Athanasoglou et al., 2008 and Dietrich et al., 2011). Bank specific variables are internal factors and are able to be controlled by the managers of banks whereas other factors are external and are not able to be controlled by the managers.

3.1.2.1 Bank Specific Factors

Capital structure (CAP): capital structure was defined by using the equity to total assets ratio. Previous literature found mixed results about the relationship between the capital ownership and the performance of a bank. Berger et al. (1995) tested the hypotheses of information and hypotheses of default cost, showing that the high proportion of equity to total assets will increase operational efficiency due to information problems and the reduction of financial distress costs. However, according to the theory of the balance between risk and returns, the high ratio of capital to assets means the lower profitability. A high ratio of capital to assets reduces capital risk, therefore reduces the yield requirements from the investors. Moreover, more equity also leads to the reduction of profit after tax as a consequence of the tax shield decreasing. Thus, this relationship may be positive (+) or negative.

Ownership structure (FOR, STATE): Ownership structure of commercial banks represents the share capital contribution of foreign investors. It will influence on business culture, governance culture, operational process, business strategies, the level of market access and other factors which can impact the ability to make profit of commercial banks. The research collected the state ownership rate as well as foreign ownership rate of banks in the data table (STATE and FOR variables). Anthanasoglou (2005) pointed out that in developing countries, foreign ownership banks had higher NIM and ROA than domestic banks. In contrast, Kosak and Cok (2008) studied banking systems in Eastern European countries and made a point that the ownership structure did not influence on ROA of banks. Therefore, to test the home advantage hypothesis, the research included dummy variable of foreign ownership rate (DUM_F) in the model to complement the continuous variables. DUM_F takes on value of 1 if the bank has foreign ownership and 0 otherwise. Obviously, the level of governance and the operational capacity of Vietnam's banks were much lower than foreign commercial banks and financial institutions. The participation of foreign investors in Vietnam's banks will help these banks to take advantages of experience and management capabilities of the partners to enhance the operating efficiency and profitability. Thus, the research expected the negative impact of state ownership and positive impact of foreign ownership on the profitability of banks.

Credit Risk (Nonperforming loans – NPL): For most of Vietnam's banks, credit risk is the most important business, which makes the largest share of profit to banks. Thus, managing lending portfolio efficiently is considered one of the most important factors influencing on the profitability of commercial banks. The level of credit risk and the quality of lending portfolios of banks may be measured by the three following ratio: (i) NPL 1= Impaired loans/gross loans, (ii) NPL2 = Loan Loss reserve/ Gross Loans, (iii) NPL3 = Loan Loss provisions/Net interest Revenues. Poor asset quality will result in poor performance of banks because of

increasingly expense to set up reserve negatively impact on the profits of the banks. Thus, this relationship is expected negative.

Liquidity Risk (LIQ): Besides credit risk, liquidity risk is one of frequent risk to commercial banking business. Liquidity risk is losses that face banks for not meeting withdrawal demands at reasonable cost. For Vietnam commercial banks, past events indicated the high possibilities of vulnerability to liquidity risk, as evidenced by the liquidity crises and deposit interest rate racing in the banking system in 2008 and 2011. In this research, two following liquidity ratios are considered: (i) LIQ1 = Liquid assets on Deposit and Short-term funding, (ii) LIQ2 = Liquid assets on total Deposit and borrowing. It is expected that these two liquidity ratios negatively influence on the profitability of banks.

Besides the two liquidity ratios above, the ratios of Loans to Total assets (LA) and Deposit and short-term funding to total assets (DEPO) are also considered. The ratio of Loans to Total assets represents income sources, and measures the liquidity of the banks' assets. Higher LA means higher profitability to banks as a result of interest income increasing. However, too high LA also means the banks' liquidity decreasing. DEPO is another indicator measuring liquidity, but on the right side (liabilities and equity) of the balance sheet. According to Trujilo-Ponce (2011), deposit is not as costly as other funds, and is one of stable funds to banks. Thus high proportion of deposit means high operational efficiency. The study of Chu and Lim (1998) showed that big banks may attract more deposit and other funds, resulting in wider net interest margin, whereas small banks regularly raising more funds by buying on interbank market and obviously, more costly than deposit (Lim and Randhawa, 2005).

For the economies with undeveloped financial markets as Vietnam, commercial banks mainly raise funds from deposit to finance business, and lending is the main activity which brings the main income. It is expected that LA and DEPO positively impact on the profitability of banks.

Scale (SIZE): The size of commercial banks will affect the competitive position as well as developing potential and making profit as a result of economy of scale. The scale of a bank is reflected by its total assets. Similar to previous study, this research also use normal logarithm of total assets to decrease the skewness of asset distributions. This variable reflects advantages of cost decreasing as a result of economy of scale. Differences in cost as a result of economy of scale may cause positive relationship between size and profitability of banks if the relationship is significant according to the studies of Molyneux and Thorton (1992), Bikker and Hu (2002),Boyd and Runkle(2000), Athanasoglouet al (2008) said that the increase in the size of the credit institutions, for example, the expansion of their market can help banks to save marginal cost. However, too large scale may negatively impact on profitability because of ineffective asset management. Therefore, this relationship may be positive or negative.

Cost to income (CI): This isthe criteriato measure the performance of the bank. It said costs accounted for what percentage of income. The higher this index, the more ineffiicient the banks operate, the lower their profits are. This paper expects negative correlation with this variable.

3.1.2.2 Macroeconomic Factors

The performance of a bank is sensitive to macroeconomic conditions. Economic growth encourages banks to lend more, allows them to have higher returns and improves asset quality. According to Bikker and Hu (2002), the cyclical changes may occur with the bank's profits.

The Growth of Gross Domestic Product (GDP): the banks'profitability depends greatly on the capital demand of the individuals and organizations in the economy. In conditions of high economic growth, banks will have more opportunities to generate profit and increase profitability. Thus, the impact of economic growth on the profitability of the banks has become more obvious. GDP grow this expected to have a positive correlation with the profitability of the bank in this paper, similar to the finding of Pasiouras and Kosmidou (2007).

Inflation (INF)

Inflation impactsonthe purpose ofdepositors andborrowers. This, in turn, affectsthecosts andincomeorthe profitability of banks. The research selected Consumer Price Index (CPI) to present inflation. Previous studies found mixed findings of the relationship between inflation and profitability. Most of studies found a positive correlation between these two variables (Bourke, 1989, Molyneux and Thornton, 1992). In developing economies, a relative high inflation rate would support the growth and development of the economy as a result of increasing demands for investment. However, too high inflation rate may cause instabilities, raising bad debts, hence reduce the profitability of banks. Therefore, mixed results were expected for this relation.

All of variables which were used in the study were summarized in the following table:

Table 3.1. Lists of variables used

	Variable	Description	Symbol	Expectation
Dependent variables	Profitability	Net profit / Total asset	ROA	
		Net profit / Equity	ROE	
		Net Interest Income / Average Interest Earning Asset	NIM	
Independent variables	Size	Ln(Total Asset)	SIZE	+/-
	Capital ratio	Equity / Total Asset	CAP	+/-
	Credit risk	Impaired loan / Gross loan	NPL1	-
		Loan loss reserve / Gross loan	NPL2	-
		Loan loss provision / Net interest revenues	NPL3	-
	Ownership	State ownership rate	STATE	-
	Structure	Dummy=1 if the bank have foreign ownership, 0 otherwise.	DUM_F	+
	Liquidity	Loan / Total asset	LA	+
		Liquid asset / Deposit & ST funding	LIQ1	-
		Liquid asset / Total deposit & Borrowing	LIQ2	-
		Deposit & ST funding / Total asset	DEPO	+
	Efficiency	Cost to Income	CI	-
	Economic cycle	GDP growth rate	GDP	+
	Inflation	Inflation growth rate	INF	+/-

3.2 Data Description and Summary Statistics

Data included annual data of 13 commercial banks over the period from 2006 to 2015, which were taken from the database bank scope by BVD, supplemented by the financial statements of banks. For macro-economic data, the research used data which were collected and calculated from statistical reports and information published by General Statistics Office of Vietnam and State Bank of Vietnam over the period from 2006 to 2015. The banks in the sample have the most complete disclosure data, however, some of them had not been full and some had merged, thus, the research used unbalanced panel data with118 observations for the final sample.

The descriptive statistics of variables were presented on table 3.3. This table showed that the group of variables reflecting the profitability of Vietnam commercial banks, which included Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM), were at the medium level with the value of 1.19%, 13.26% and 3.33%, respectively. This indicated that the profitability of Vietnam banks were average (As mentioned above, typically, ROA of 1% -2% and ROE of 10% - 20% revealed a medium level for the profitability of the banks). At the same time, the high Standard Deviations of the variables showed the great volatilities of variables during the period of study. More specifically, ROA fluctuated from 0.026% to 2.707%, the variability of ROE was even greater, from 0.305% to 44.253%, whereas the range of NIM was from 0.53% to 7.306%. This was explained by (i) firstly, recent economic shocks significantly impacted on business operations of the banks; (ii) secondly, there were significant gaps between groups of banks in term of capital structure, business capacity, and profitability.

Table 3.2. Summary Statistics

	Mean	Median	Maximum	Minimum	Std. Dev	N
Dependent Variables						
ROA	1.1422735	1.209	2.707	0.026	0.62718984	117
ROE	13.2619573	13.03	44.253	0.305	8.13998114	117
NIM	3.33200855	3.301	7.306	0.53	1.09656186	117
Explanatory Variables						
CAP	9.43222222	8.269	38.675	3.799	4.57889158	117
CI	46.1957692	43.167	87.184	24.412	13.059065	117
DEPO	83.63	84.97	94.03	58.24	6.15775294	117
LA	51.7660342	53.851	80.838	22.005	13.6941884	117
LIQ1	29.3093333	27.681	91.609	7.161	15.1584014	117
LIQ2	29.3025981	28.245	87.989	7.022	14.5665103	107
NPL1	2.26535965	1.877	11.399	0.083	1.73679423	114
NPL2	1.3885812	1.182	4.341	0.013	0.76784915	117
NPL3	17.3760603	14.2365	104.364	-29.937	14.7365099	116
SIZE	11.2678407	11.5601559	13.5663868	7.18692144	1.18390352	110
STATE	13.96	0	100.00	0	30.5246165	118
DUM_F	0.25	0	1	0	0.43728847	118
INF	9.43	7.39	23.12	0.63	6.36035181	118
GDP	6.01	6.00	7.10	5.20	0.61876991	118

[1]*Results are based on author' own computation*

Regarding explanatory variables, the means of group variables including CAP, DEPO, LA, and SIZE were 9.43%, 83.63%, 51.77%, and 11.27 respectively. With high figure, CAP pointed out that Vietnam banking system generally coped with regulatory requirements of minimum capital adequacy ratio. The high value for the means of DEPO and LA revealed that the main business of the banks was raising funds and lending. However, the figure of 51.77% for loans to assets, which was not too high, indicated that Vietnam banks noticed diversify business to spread risks. The medium standard deviations of these variables showed that the data series were relatively homogeneous and stable. Besides, the means of variables reflecting liquidity including LIQ1 and LIQ2 were 29.31% and 29.30%, respectively. The standard deviations of the two variables, 15.16% and 14.57%, respectively, indicated the high degree of dispersion of the two series.

The means of variables representing assets quality (NPL1, NPL2, NPL3) were 2.27%, 1.39%, and 17.38%, respectively. The high standard deviations (1.74%, 0.77% and 14.74%, respectively) showed the wide dispersion as well as heterogeneous of the data.

Table 3.3. Correlations Matrix

	CAP	CI	DEPO	LA	LIQ1	LIQ2	NPL1	NPL2	NPL3	SIZE	STATE	DUM_F	GDP	INF
CAP	1.000	-0.100	-0.484	0.127	0.227	0.258	0.074	-0.153	-0.061	-0.639	-0.256	-0.008	0.086	0.074
CI	-0.100	1.000	0.268	0.089	-0.395	-0.390	0.229	0.038	0.053	0.149	-0.109	0.288	-0.417	-0.264
DEPO	-0.484	0.268	1.000	-0.114	-0.273	-0.207	0.056	0.265	-0.018	0.331	0.060	0.165	-0.331	-0.190
LA	0.127	0.089	-0.114	1.000	-0.594	-0.601	-0.032	-0.029	0.161	-0.128	0.198	0.127	-0.049	-0.149
LIQ1	0.227	-0.395	-0.273	-0.594	1.000	0.992	-0.083	-0.120	-0.255	-0.214	-0.009	-0.244	0.387	0.177
LIQ2	0.258	-0.390	-0.207	-0.601	0.992	1.000	-0.071	-0.099	-0.276	-0.233	-0.034	-0.241	0.355	0.181
NPL1	0.074	0.229	0.056	-0.032	-0.083	-0.071	1.000	0.526	0.333	0.023	-0.054	0.051	-0.179	-0.101
NPL2	-0.153	0.038	0.265	-0.029	-0.120	-0.099	0.526	1.000	0.259	0.410	0.390	0.072	-0.200	-0.043
NPL3	-0.061	0.053	-0.018	0.161	-0.255	-0.276	0.333	0.259	1.000	0.153	0.235	-0.002	0.031	-0.164
SIZE	-0.639	0.149	0.331	-0.128	-0.214	-0.233	0.023	0.410	0.153	1.000	0.527	0.193	-0.223	-0.143
STATE	-0.256	-0.109	0.060	0.198	-0.009	-0.034	-0.054	0.390	0.235	0.527	1.000	-0.008	0.124	-0.008
DUM_F	-0.008	0.288	0.165	0.127	-0.244	-0.241	0.051	0.072	-0.002	0.193	-0.008	1.000	-0.204	-0.281
GDP	0.086	-0.417	-0.331	-0.049	0.387	0.355	-0.179	-0.200	0.031	-0.223	0.124	-0.204	1.000	-0.009
INF	0.074	-0.264	-0.190	-0.149	0.177	0.181	-0.101	-0.043	-0.164	-0.143	-0.008	-0.281	-0.009	1.000

Results are based on author' own computation

Table 3.3 showed the correlations matrix of explanatory variables. Strong correlations between variables may cause multicollinearity, influencing the efficiency of the estimators. According to Kennedy (2008), the correlations were considered strong when the absolute values of the correlation coefficients were over 0.80. Meanwhile, Anderson, Sweeney and Williams (1990) supposed that the multicolinearity occurred when the correlation coefficients was over 0.7. Basing on these standards, in table 4.4, only LIQ1 and LIQ2 significantly related (with the correlation coefficient of 0.992, however, these two variables will be estimated separately in models. Some noticeable correlations were SIZE and CAP, LIQ2 and LA (with the correlations coefficient over 0.6 to under 0.7). Thus, by testing correlations coefficient, there were not clear signals for multicolinearity.

3.3 Model Selection

The research aims to test hypotheses of factors, which include both of micro and macro influencing on profitability of Vietnam commercial banks. Using Panel data set is the most reasonable method with a range of advantages such as raising the number of data points, partly overcoming the multicollinearity, and being able to address many important questions that cross-sectional or time series data set cannot. It also allows the study to look at the problems of heterogeneity, uncertainty of each bank in the sample of data. Population regression equation is used in the research:

$$PROF_{it} = \beta_0 + \beta_1 STATE_{it} + \beta_2 DUM\_F_{it} + \beta_3 CAP_{it} + \beta_4 SIZE_{it} + \beta_5 CI_{it} + \beta_6 NPL_{it} + \beta_7 LIQ_{it} + \beta_8 GDP_{it} + \beta_9 INF_{it} + \varepsilon_{it}$$

With, $PROF_{it}$ represented dependent variables including ROA, ROE, NIM. Proxies for credit risk (NPL1, NPL2, NPL3) as well as those for liquidity risk (LIQ1, LIQ2, DEPO, LA) will be put in turn into the regressive model. As a result, there would be twelve models for each dependent variable with various combination of credit risk and liquidity risk independent variables. $\varepsilon_{it} \sim$ i.i.d $(0; \sigma_i^2)$; $\sigma_i^2 = \sigma_\varepsilon^2 \forall i$; Cov $(\varepsilon_{it}, \varepsilon_{jt}) = 0$ when $i \neq j$.

Pool OLS estimation will be run first.Pool OLS ignores time and cross-section effects, thus, fixed effects model (FEM) and random effects model (REM) would be used (Maudos and Fernandez, 2004). To compare the efficiency of the two models (fixed effects model and random effects model), Hausman test was performed with the help of Eviews.

Table 3.4 summarised the results of Hausman tests, which was taken from a number of models with three dependent variables (ROA, ROE, NIM, respectively). As can be seen from the table, the fixed effects models

were more efficient for two regressions with NIM as dependent variables, and two combinations of NPL1 and DEPO, NPL1 and LA as independent variable, respectively, (the prob-value of under 5%) whereas the random effects model was more efficient for the remaining (the prob-value of over 5%).

Table 3.4. The result of Hausman Test

	ROA		ROE		NIM	
	Chi-S	Prob	Chi-S	Prob	Chi-S	Prob
NPL1, LIQ1	14.25273	0.1136	9.792869	0.3675	14.8145	0.0962
NPL1, LIQ2	13.63337	0.136	9.979473	0.3521	15.82242	0.0707
NPL1, DEPO	11.82388	0.2234	6.182304	0.7215	25.37758	0.0026
NPL1, LA	8.935212	0.4433	6.800709	0.6579	24.30073	0.0039
NPL2, LIQ1	7.686776	0.566	5.694026	0.7701	4.974808	0.8365
NPL2, LIQ2	7.294443	0.6065	5.459549	0.7926	5.941547	0.7458
NPL2, DEPO	10.54988	0.3078	5.435087	0.7949	8.72726	0.4628
NPL2, LA	6.198607	0.7199	5.765426	0.7631	7.713666	0.5632
NPL3, LIQ1	6.487596	0.6903	7.748867	0.5596	7.088527	0.6279
NPL3, LIQ2	7.646947	0.5701	9.816829	0.3655	7.154313	0.6211
NPL3, DEPO	11.29995	0.2557	5.08142	0.8272	9.525343	0.3903
NPL3, LA	7.397701	0.5958	10.00427	0.3501	9.248809	0.4146

(*Note:* Results are based on author' own computation)

4. Empirical Results

Table 4.1, 4.2, 4.3 showed the results of regressions which explored the determinants of profitability of banks:

Table 4.1. Summary of Results of Regressions of determinants of ROA

ROA	Model 1 (REM)	Model 2 (REM)	Model 3 (REM)	Model 4 (REM)	Model 5 (REM)	Model 6 (REM)	Model 7 (REM)	Model 8 (REM)	Model 9 (REM)	Model 10 (REM)	Model 11 (REM)	Model 12 (REM)
C	3.4271*** (4.0134)	3.5402*** (4.0027)	4.1157*** (3.5184)	2.3099*** (2.4619)	3.4958*** (3.9102)	3.5452*** (3.7978)	4.1396*** (3.5012)	2.4785*** (2.5897	3.4905*** (4.9355)	3.3642*** (4.6454)	4.0784*** (4.4316)	3.2753*** (3.8021)
STATE	-0.0022 (-1.0508)	-0.0021 (-0.9753)	-0.0024 (-1.0770)	-0.0038 (-1.6480)	-0.0030 (-1.0929)	-0.0029 (-1.0379)	-0.0025 (-1.0309)	-0.0038 (-1.4316)	-0.0009 (-0.3749)	-0.0008 (-0.3633)	-0.0006 (-0.2996)	-0.0073 (-1.3199)
DUM_F	-0.1354 (-1.4375)	-0.1387 (-1.4197)	-0.1354 (-1.4381)	-0.2104** (-2.2149)	-0.1574 (-1.6051)	-0.1523 (-1.4857)	-0.1459 (-1.5416)	-0.2351** (-2.4045)	-0.1766 (-2.3004)	-0.1623** (-2.0530)	-0.1566** (-2.1153)	-0.2331*** (-2.7701)
CAP	0.0031 (0.3134)	0.0022 (0.2152)	-0.0027 (-0.2319)	0.0029 (0.2962)	-0.0016 (-0.1544)	-0.0019 (-0.1768)	-0.0048 (-0.4031)	0.0001 (0.0108)	0.0064 (0.7889)	0.0085 (1.0346)	0.0023 (0.2449)	0.0013 (0.1491)
SIZE	-0.0073 (-1.1401)	-0.0137 (-0.2547)	-0.0112 (-0.2134)	0.0278 (0.5236)	-0.0103 (-0.1812)	-0.0150 (-0.2533)	-0.0168 (-0.3047)	0.0196 (0.3487)	0.0012 (0.0266)	0.0067 (0.1468)	-0.0001 (-0.0026)	-0.0017 (-0.0337)
CI	-0.0380*** (-11.515)	-0.0381*** (-11.401)	-0.0375*** (-11.131)	-0.0378*** (-11.678)	-0.0384*** (-11.427)	-0.0386*** (-11.310)	-0.0380*** (-11.312)	-0.0379*** (-11.535)	-0.0379*** (-14.536)	-0.0382*** (-14.675)	-0.0373*** (-14.275)	-0.0369*** (-13.520)
INF	0.0047 (0.8204)	0.0048 (0.8237)	0.0041 (0.7115)	0.0080 (1.4150)	0.0054 (0.9474)	0.0053 (0.9066)	0.0048 (0.8374)	0.0087 (1.5327)	0.0008 (0.1759)	0.0003 (0.0604)	-0.0002 (-0.0435)	0.0024 (0.5275)
GDP	-0.0701 (-1.0958)	-0.0772 (-1.1810)	-0.0823 (-1.2820)	-0.0330 (-0.5337)	-0.0740 (-1.1629)	-0.0732 (-1.1032)	-0.0839 (-1.3174)	-0.0429 (-0.6941)	-0.0568 (-1.1404)	-0.0402 (-0.7839)	-0.0755 (-1.5227)	-0.0389 (-0.7796)
NPL1	-0.0217 (-1.1194)	-0.0212 (-1.0813)	-0.0220 (0.2595)	-0.0190 (-1.0010)								
NPL2					-0.0094 (-0.1502)	-0.0025 (-0.0395)	-0.0086 (-0.1440)	-0.0229 (-0.3831)				
NPL3									-0.0156*** (-7.8342)	-0.0160*** (-7.9433)	-0.0155*** (-7.9255)	-0.0149*** (-7.1892)
LIQ1	0.0003 (0.0993)				0.0008 (0.2679)				-0.0009 (-0.3552)			
LIQ2		0.0005 (0.1662)				0.0009 (0.2610)				-0.0019 (-0.7260)		
DEPO			-0.0063 (0.3918)				-0.0057 (-0.7692)				-0.0057 (-0.9795)	
LA				0.0097*** (2.7563)				0.0096*** (2.5538)				0.0040 (1.0653)

(*, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively)

Table 4.2. Summary of Results of Regressions of determinants of ROE

ROE	Model 1 (REM)	Model 2 (REM)	Model 3 (REM)	Model 4 (REM)	Model 5 (REM)	Model 6 (REM)	Model 7 (REM)	Model 8 (REM)	Model 9 (REM)	Model 10 (REM)	Model 11 (REM)	Model 12 (REM)
C	29.9951*** (2.5994)	29.4416*** (2.4581)	51.9592*** (3.1675)	33.4406*** (2.4539)	31.4608*** (2.6425)	30.1909*** (2.4142)	52.2545*** (3.1552)	35.2114*** (2.5749)	31.4285*** (3.2664)	27.9573*** (2.8244)	52.0242*** (3.8789)	37.4302*** (3.4492)
STATE	-0.0018 (-0.0586)	-0.0006 (-0.0201)	0.0040 (0.1138)	0.0046 (0.1278)	-0.0078 (-0.2091)	-0.0070 (-0.1814)	0.0061 (0.1608)	0.0081 (0.2094)	0.0235 (0.7934)	0.0222 (0.7756)	0.0328 (1.0905)	0.0379 (1.3509)
DUMF	-2.8837** (-2.2685)	-2.8964** (-2.1931)	-3.4851*** (-2.6299)	-3.7421*** (-2.7078)	-2.9972** (-2.2963)	-2.9655** (-2.1620)	-3.6281*** (-2.7292)	-3.9024*** (-2.7923)	-3.2197*** (-3.0679)	-3.0392*** (-2.8031)	-3.6356*** (-3.3686)	-3.6112*** (-3.2606)
CAP	-0.6200*** (-4.6178)	-0.6252*** (-4.5426)	-0.7093*** (-4.3380)	-0.5736*** (-4.0557)	-0.6473*** (-4.7105)	-0.6451*** (-4.5455)	-0.7200*** (-4.3220)	-0.5903*** (-4.1349)	-0.5390*** (-4.8455)	-0.5137*** (-4.5289)	-0.6295*** (-4.6620)	-0.5036*** (-4.3974)
SIZE	0.6278 (0.8849)	0.6385 (0.8660)	0.1470 (0.1966)	0.2554 (0.3297)	0.5186 (0.6828)	0.5737 (0.7195)	0.0808 (0.1035)	0.1998 (0.2482)	0.6704 (1.1151)	0.8337 (1.3528)	0.2411 (0.3919)	0.2811 (0.4542)
CI	-0.3874*** (-8.7382)	-0.3892*** (-8.6827)	-0.3879*** (08.1984)	-0.4040*** (-8.6519)	-0.4004*** (-8.9552)	-0.4040*** (-8.8581)	-0.3947*** (-8.3577)	-0.4080*** (-8.7058)	-0.3936*** (-10.989)	-0.3981*** (-11.091)	-0.3889*** (-10.208)	-0.4037*** (-10.876)
INF	0.0301 (0.3969)	0.0305 (0.3948)	0.0325 (0.4091)	0.0540 (0.6676)	0.0332 (0.4366)	0.0320 (0.4106)	0.0421 (0.5304)	0.0623 (0.7678)	-0.0228 (-0.3673)	-0.0290 (-0.4600)	-0.0238 (-0.3631)	-0.0138 (-0.2065)
GDP	-0.4283 (-0.5020	-0.3241 (-0.3713)	-0.1502 (-0.1689)	0.2481 (0.2802)	-0.4830 (-0.5708)	-0.3228 (-0.3649)	-0.2323 (-0.2627)	0.0997 (0.1133)	-0.2773 (-0.4042)	0.0985 (0.1389)	-0.1008 (-0.1402)	0.1859 (0.2626)
NPL1	-0.3269 (-1.2649)	-0.3258 (-1.2434)	-0.3479 (-1.2888)	-0.3191 (-1.1724)								
NPL2					0.0341 (0.0409)	0.0058 (0.0068)	-0.4232 (-0.5001)	-0.5337 (-0.6254)				
NPL3									-0.1898*** (-6.9431)	-0.1956*** (-7.0348)	-0.1988*** (-7.0059)	-0.2007*** (-7.0747)
LIO1	0.1197*** (3.0848)				0.1253*** (3.0502)				0.1001*** (3.0690)			
LIO2		0.1226*** (2.9539)				0.1272*** (2.8607)				0.0897** (2.2536)		
DEPO			-0.1644 (-1.5968)				-0.1525 (-1.4624)				-0.1567* (-1.8516)	
LA				0.0081 (0.1538				0.0069 (0.1272)				-0.0252 (-0.6035)

(*, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively)

Table 4.3. Summary of Results of Regressions of determinants of NIM

NIM	Model 1 (REM)	Model 2 (REM)	Model 3 (FEM)	Model 4 (FEM)	Model 5 (REM)	Model 6 (REM)	Model 7 (REM)	Model 8 (REM)	Model 9 (REM)	Model 10 (REM)	Model 11 (REM)	Model 12 (REM)
	5.0519**	4.8635**	1.6939	-3.2112	4.6318**	4.4896**	3.6709	-1.0241	4.4627**	4.0888*	2.6707	-1.4306
C	(2.4748)	(2.3124)	(0.5403)	(-1.3571)	(2.2269)	(2.0813)	(1.3077)	(-0.5029)	(2.2103)	(1.9481)	(0.9545)	(-0.7013)
STAT	0.0001	-0.0005	-0.0040	0.0045	-0.0027	-0.0036	-0.0052	-0.0084	0.0024	0.0010	-0.0006	-0.0049
E	(0.0207)	(-0.0966)	(-0.2377)	(0.3060)	(-0.3483)	(-0.4825)	(-0.7124)	(-1.2438)	(0.3372)	(0.1459)	(-0.0850)	(-0.7303)
				-0.8116**				-0.6045**				-0.6404**
DUM_	-0.3547	-0.3360	-0.4464*	*	-0.3638	-0.3816	-0.2260	*	-0.4321*	-0.4351*	-0.2879	*
F	(-1.5805)	(-1.4511)	(-1.8056)	(-3.5803)	(-1.6074)	(-1.6225)	(-1.0011)	(-2.9067)	(-1.9789)	(-1.9107)	(-1.2778)	(-3.0716)
	0.0457*	0.0498**	0.0421	0.0498**	0.0374	0.0401	0.0317	0.0362*	0.0545**	0.0594**	0.0505*	0.0484**
CAP	(1.9363)	(2.0701)	(1.3189)	(2.1073)	(1.5773)	(1.6551)	(1.1185)	(1.7264)	(2.3573)	(2.5023)	(1.7829)	(2.2808)
				0.4396**								0.3701**
	0.0994	0.1151	0.2811*	*	0.0832	0.1002	0.1391	0.2846**	0.1458	0.1766	0.2493*	*
SIZE	(0.7852)	(0.8841)	(1.8324)	(3.2055)	(0.6218)	(0.7232)	(1.0390)	(2.3680)	(1.1434)	(1.3314)	(1.9129)	(3.1607)
	-0.0310**	-0.0308**	-0.0286**	-0.0249**	-0.0332**	-0.0328**	-0.0326**	-0.0288**	-0.0300**	-0.0295**	-0.0284**	-0.0250**
	*	*	*	*	*	*	*	*	*	*	*	*
CI	(-3.9885)	(-3.9403)	(-3.2258)	(-3.3459)	(-4.3038)	(-4.2030)	(-4.0617)	(-4.1694)	(-4.0507)	(-3.9446)	(-3.5810)	(-3.6636)
	0.0178	0.0176	0.0156	0.0296	0.0154	0.0160	0.0118	0.0262**	0.0125	0.0122	0.0091	0.0241**
INF	(1.3428)	(1.3085)	(1.1282)	(2.4159)	(1.1889)	(1.2197)	(0.8875)	(2.2311)	(0.9793)	(0.9462)	(0.6809)	(1.9986)
	-0.2100	-0.2132	-0.2442	-0.1155	-0.1587	-0.1777	-0.2353	-0.1105	-0.1600	-0.1621	-0.2631*	-0.1441
GDP	(-1.4099)	(-1.4034)	(-1.5518)	(-0.8469)	(-1.1005)	(-1.1868)	(-1.5882)	(-0.8649)	(-1.1366)	(-1.1077)	(-1.7791)	(-1.1203)
	-0.0014	-0.0027	0.0042	-0.0006								
NPL1	(-0.0311)	(-0.0598)	(0.0869)	(-0.0143)								
							0.3885**					
					0.3022**	0.3053**	*	0.3282**				
NPL2					(2.0643)	(2.0709)	(2.6858)	(2.5787)				
									-0.0160**	-0.0170**		
									*	*	-0.0141**	-0.0102*
NPL3									(-2.8375)	(-2.9411)	(-2.4039)	(-1.9521)
	-0.0227**								-0.0239**			
	*				-0.0183**				*			
LIQ1	(-3.2876)				(-2.5339)				(-3.4964)			
		-0.0239**								-0.0247**		
		*				-0.0184**				*		
LIQ2		(-3.2684)				(-2.3855)				(-3.3329		
			0.0098				0.0024				0.0062	
DEPO			(0.5073)				(0.1328)				(0.3471)	
				0.0535**				0.0460**				0.0454**
				*				*				*
LA				(5.2081)				(5.4842)				(5.3635)

(*, **, *** denote statistical significance at the 10%, 5%, and 1% level, respectively)

4.1 The Impact of Bank-specific Factors on the Probability of Vietnam Commercial Banks

Ownership structure (FOR, STATE): The results of regressions showed that there were no statistically significant relationship between the state ownership and the profitability of Vietnamese banks. For the effect of foreign ownership, the results of regressions showed that the foreign ownership negatively impacted on ROE in all of twelve models with various combinations of credit risk and liquidity risk independent variables. For the models with NIM and ROA as dependent variables, the study found the negative relationship between foreign ownership and ROA or NIM in six of twelve models. The coefficients of foreign ownerships in the remaining regressions were also negative but not statistically significant. These findings were contrary to study by Claessens et al. (2001), which found that foreign ownership contributed to reduce inefficiencies of banks. The previous study by KieuHuuThien et al. (2014) suggested that the effects of foreign ownership were not really obvious. It seemed that, in Vietnam, foreign ownership banks still did not take their advantages of modern technology and management capacity. Besides, this may be because the participations of foreign investors in the corporate governance and management of Vietnam banks were insignificant, resulting in their influence on the operations of banks also being limited. Decree 01/2014/DECREE-GOV, which replaced Decree 69/2007/DECREE-GOV, raised foreign ownership ratio of companies to 30%, in which, the ownership ratio of one foreign institution must not exceed 15%, except for strategic investors (applying the celling ratio of 20%). These limitations caused foreign investors difficulties to engage the Board of Directors. Besides, the short periods of engagement and low ownership ratios led to their role very faint.

Capital structure (CAP): The regression revealed the positive relations between the equity to total assets ratio

and NIM in eight of twelve models. These results were consistent with some previous studies in emerging economies, a high rate of equity to total assets meant high profitability, by Athanasoglou et al. (2008) and Pasiouras and Kosmidou (2007). The theory argued that in cases of asymmetric information between managers and investors, lower-risk banks would have advantages of transmitting their positive signals through a high ratio of equity to total assets. Other researches emphasized that in developing countries the amount of equity was one of top concerns by depositors, hence, banks with more equity would attract lower-yielded and more stable deposits, which, in turn, would positively impact on their profits, especially their NIM. These positive relations also proved that the franchise-value hypothesis was right in case of Vietnam commercial banks. Efficient banks increasingly tent to choose holding more equity to earn profit as a result of high efficiency.

However, the similar relations did not find in the models with the dependent variable ROA whereas regressions with ROE as dependent variable showed reverse relations. The changes in capital holding ratio negatively impacted on ROE of Vietnam banks. These results were opposed to theories of positive relation between capital adequacy and profitability. The contradicting effects of CAP on NIM and ROE pointed out that Vietnam banks effectively take advantages of high capital adequacy to attract lower-yielded and more stable deposits in raise their NIM but cannot raise their ROE. This may explained by study of Bensaid (1995). Accordingly, the way for bank to deal with moral hazard caused banks' profit depending on unobservable decision. The study results may attribute to the fact that the study period was also the difficult period of Vietnam banks, when the growth rate declining led to corporations to refrain from business investment. This, accompanied by high NPL rate, caused ROE of banks over this period (2011-2015) to decrease significantly compared to those during the previous period. The evidence was that the average of ROE of banks in the sample was only 13.26% whereas that figure was 16.79% over the previous period from 2006 to 2010. Meanwhile, new regulations (Circular 13/2010/CIR-SBV and Circular 36/2014/CIR-SBV) forcing banks to raise CAR from 8% to 9% might cause negative relations as shown in the model.

Size of Assets (SIZE): The results of estimation pointed out the positive relation between the size of Vietnam banks and their NIM in only five of twelve models. For models with ROEor ROA as dependent variables, the study did not find any statistically significant relationships between size and profitability of bank. The unclear impact of the variable scale on the profitability of banks may be explained basing on the study of Berger et al. (2008). The study argued that this was due to group effects of state commercial banks. In Vietnam, state-hold-dominant-share banks were also the largest banks. However, as explained above, the profitability of these banks was instable and tent to decrease partly due to pressures to lend inefficient state corporations. The results of estimation for variable SIZE were also explained by the fact that in the past period, small banks and newly established banks usually tent to focus on increasing scale and ignore the quality of lending portfolios, which negatively impact on their profitability. The trends of merge and acquisitions have occurred recently and still have not caused positive influences.

Operational Efficiency (Cost to Income - CI): Cost to income was determined negatively related to the profitability of banks for all of models with various dependent variables at the very high level of statistical significance, which was consistent with studies of Molyneaux and Thornton (1992), Athanassoglou (2006). This proved that cost management was one of the most important factors impacting on the profitability of banks. This proxy indicated operational efficiency of banks, with low value equivalent to high operational efficiency. The estimators showed that the more efficient the banks were, the higher their profitability was. Athanasoglou et al. (2008) found the similar results. In Vietnam, in the period of overheating growth, the income of most banks rose sharply, however, the related costs also tent to increase. Only institution managing their costs efficiently can keep the pace of costs increase slower than that of income increase, ensuring profit earning.

Credit Risk (Non-performing loans NPL): The study pointed out negative and statistically significant relationship between NPL3 and the profitability of banks in all of model with NPL3 as independent variables. NPL2 also negatively and statistically significantly influenced on NIM. However, the research could not found any similar relations between NPL1 and the profitability of banks. These were consistent with study of Athanasoglou et al. (2008). This was explained easily that increasing bad debts would cause bank to increase expense to reserve, hence, the profit of banks would decrease. However, the similar relations did not found in the regressing models with independent variables NPL1 as well as NPL2. This may be explained by the context of Vietnam in and after the crisis. The influence of the crisis on Vietnamese banks was quite late, from 2012 with a period of continuous drops of profits and increase of nonperforming loans. Traditionally, Vietnamese banks were required to hold the NPL rate under 3%, hence, most of banks were not ready to disclosure their real NPL rate. Also, Vietnamese banks had been allowed to use loan loss reserve to write off uncollectible debts (balancing the uncollectible debts by their loan loss reserve). This, in turn, improved the NPL rate (impaired loans/gross loans)

of banks and became one of favorite method of some banks to decrease the NPL rate. This reaction of banks caused both of the NPL rate, specifically NPL1 (impaired loans/gross loans), to decrease and not to be able to a reliable measure for credit risk. This also partly changed NPL2 (loan loss reserve/gross loans) whereasNPL3 (Loan loss provision/Net interest revenues), in contrast, was not noticeable influenced by this reaction and became the most reliable and effective to measure credit risk.

Liquidity Risk (LIQ): Besides Credit risk, liquidity is also a top concern by banks. In theory, most of studies pointed out the negative relation between liquidity and profit of banks. Improved liquidity meant that the proportion of liquid assets, which always yield lower income, increased, reducing the profit of banks. The study found negative relation between LIQ1 and LIQ2 to NIM in all of twelve models and positive relation between LIQ1 and LIQ2 to ROE in models with ROE as dependent variables. The research continued to consider the impact of other liquidity variable such as DEPO and LA. LA was found that positively influence on the profitability of banks (all of models with ROA and NIM as independent variables) whereas the influence of DEPO on the profitability of bank was not statistically significant. This was contrary to the finding of Athanasoglou et al. (2008). All of these differences can be explained by in Vietnam, in period of severe liquidity as a result of financial crisis, banks competed by interest rate and continuously exceed celling interest rates of raising funds. This contributed to distort the picture of the profitability of Vietnam banks.

4.2 The Impact of Macroeconomic Factors on the Profitability of Vietnam Commercial Banks

Economic growth (GDP): Economic growth was expected that positively to impact on the profitability of banks. However, the regression model did not show any statistically significant relations similar to previous studies between GDP and the profitability of Vietnamese banks.

Inflation ratio (INF): The coefficients for variable INF were positive in only three of twelve models with dependent variable NIMat statistical significance of 5% and the same signs in models with dependent variable ROA and ROE but not statistically significant. The positive signs may be explained by the influence of inflation expectations of customers, which revealed that abnormal profits may be made as a result of asymmetric information. These results were consistent with the finding of Greek banks by Panayiotis et al. (2005).

5. Conclusion

The research explored determinants of profitability of Vietnam commercial banks. Factors influencing the profitability of Vietnamese banks were divided into two categories: bank-specific factors and macroeconomic factors. Using Regression Analysis for Panel Data set of Vietnam commercial banks over the period from 2006 to 2015, the study found the following:

- There were no statistically significant relationship between the state ownership and the profitability of Vietnamese banks, whereas the foreign ownership may negatively influence on their profitability.

- Capital structure was positively related to NIM of a bank but negatively related to ROE. This was explained by the research context, which NPL rate of Vietnamese banks continuously increased, the banks had to set up significant amount of provision, leading to their profits and ROEs decreased whereas their CAR increased under new regulations.

- Size of Assets did not have clear relationship with the profitability of Vietnamese banks.

- Cost to income is one of the most effective determinants of profitability of Vietnamese banks. It revealed an obvious negative relation to the profitability of Vietnam banks at very high level of confidence.

- NPL3 (Loan loss provision/Net interest revenues) was the most effective measures of credit risk of Vietnamese banks whereas nonperforming loan rate and loan loss reserve on gross loans were not. The level of credit risk (which measured by NPL3) negatively impacted on the profitability of Vietnam banks.

- Competition on mobilization interest rates among banks over the study period distorted the relationships between liquidity risk and the profitability of Vietnamese banks. In general, improved liquidity (increase in LIQ1 and LIQ2, and decrease in LA) negatively influenced on NIM, decrease in LA also led to ROA declining. However, increase in LIQ1 and LIQ2 resulted in ROE rising.

- Regarding macroeconomic factors, the regression modeled did not reveal obvious relationship between macroeconomic factors (GDP and INF) and the profitability of Vietnamese banks.

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[i] CAP = equity/total assets; SIZE = ln(total assets); CI = Cost to Income; DEPO = Deposit & Short-term funds/ Total assets; LA = Loans/ Total assets; LIQ1 = Liquid assets/ Deposit & Short-term funding; LIQ2 = Liquid assets/ Total deposit & Borrowing; NPL1 = impaired loans/gross loans; NPL2 =Loan loss reserve/ Gross loans; NPL3 = Loan loss provisions/ Net interest revenues; STATE = state ownership rate; DUM_F = Foreign ownership rate (Dummy); INF = Inflation rate; GDP = Growth rate of Gross Domestics Products

[ii] CAP = equity/total assets; SIZE = ln(total assets); CI = Cost to Income; DEPO = Deposit & Short-term funds/ Total assets; LA = Loans/ Total assets; LIQ1 = Liquid assets/ Deposit & Short-term funding; LIQ2 = Liquid assets/ Total deposit & Borrowing; NPL1 = impaired loans/gross loans; NPL2 =Loan loss reserve/ Gross loans; NPL3 = Loan loss provisions/ Net interest revenues; STATE = state ownership rate; DUM_F = Foreign ownership rate (Dummy); INF = Inflation rate; GDP = Growth rate of Gross Domestics Products[ii]

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