How does Intellectual Capital Affect Organizational Performance?

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Abstract

The link between intellectual capital and organizational performance is becoming more and more an interesting issue, when companies are seeking for new solutions in order to survive and develop their business. The simultaneous equation model is used to examine subsidiary banks of financial holding company (FHC) and independent banks in Taiwan. From the empirical findings, there is a basic difference between subsidiary banks of FHC and independent banks, specifically on the mediating role of customer capital. In spite of this difference, there are also important similarities across the three stages. That is, two of the four paths are significant and are in the hypothesized direction for subsidiary banks of FHC and independent banks: (1) the effect of human capital on process capital and (2) the effect of human capital on customer capital.

Keywords: Intellectual capital; Organizational performance; Simultaneous equations

1. Introduction

The resource-based view (RBV) originally proposed by Penrose (1959) and later developed by Wernerfelt (1984), it has been one of the dominant theoretical frameworks that address the relationship between input resources and performance (Coates & McDermott, 2002; Helfat & Peteraf, 2003). However, the RBV does not explain the process of transformation from input resources being turned into corporate value (Tseng & Goo, 2005). In contrast, the intellectual capital (IC) places greater emphasis on resources used in action, creation, and control (Edvinsson & Malone 1997; Peppard & Rylander, 2001). IC is the most valuable asset to enterprises, and it represents the collective knowledge that is embedded within the human resources, organizational resources, customer bases and network relationships of enterprises (Andreou & Bontis, 2007; Andreou et al, 2007). In nowadays knowledge-based economy, IC not only plays as a critical indicator for organizational performance, but also an supportive indicator used by enterprises to provide value creation methods in attaining their sustainable competitive advantages (Marr et al, 2003; Mavridis, 2005; Shih et al, 2010). Previous studies also identified the positive correlation between IC and organizational performance (Bontis et al, 2000; Cabrita & Bontis, 2008; Cater & Cater, 2009; Sharabati et al, 2010; Hernandez & Noruzi, 2010; Yang & Wang, 2011).

If the cause-and-effect relationship among valuable resources could be understood, the improvement of organizational performance may be facilitated through the appropriate management of key factors in advance. This study believes that causal approaches such as simultaneous equations could benefit from a better understanding of how valuable resources interact to create organizational performance. The objectives in this study are: (1) to present empirical evidence to use the actual data with respect to IC instead of questionnaire that some of literature information collects, (2) to identify the cause-and-effect relationships between IC and organizational performance for financial industry. The remainder of the paper is organized as follows. Section 2 develops the conceptual framework and research hypotheses. Section 3 explains the sample selection and research design. Section 4 presents the empirical results, and section 5 concludes with study's research results and their implications.

2. Conceptual Framework and Hypotheses

Bontis et. al. (2000) defined IC as human, relational, and structural capital. Even though there are many classifications of IC, this study follow the most commonly used classification and divide it into three categories, which include human, process, and customer capital (Tseng & Goo, 2005, Cheng, et al, 2010). Human capital is inherently developed and represents an employee's competence, innovative capacity, prior work experience, and know-how (Martinez-Torres, 2006). Process capital is the capability of a firm to develop internal structure, procedures, and techniques (Cheng et al, 2010; Kianto et al, 2010). Customer capital is the resource and knowledge embedded within the relationships with customers and strategic partners. It also represents brand image, customer satisfaction, customer loyalty, and negotiation power from external parties. (Peppard & Rylander, 2001; Cheng et al, 2010; Kianto et al, 2010). Based on the framework of IC, the conceptual framework of this study is developed and presented in Figure 1. I elaborate the hypotheses as follows:

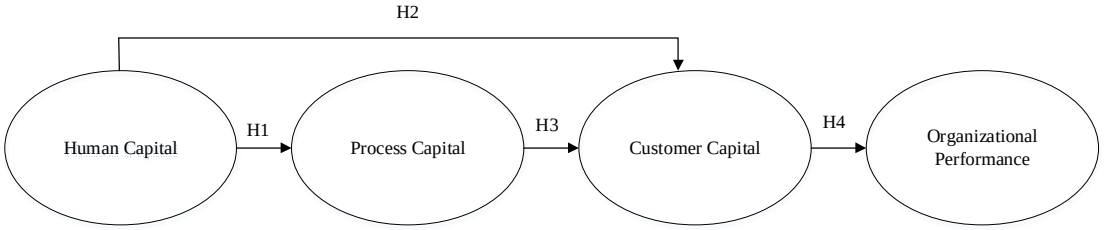

Figure 1: Conceptual Framework

First, in order to improve production and process innovation, besides relying on the company's encouragement, raising employee capability is also an important impact factor. Human capital is therefore the critical source of production and process innovation (Appuhami, 2007). Previous empirical studies revealed that human capital does not directly influence customer capital but indirectly affects customer capital through process capital (Wang & Chang, 2005). Otherwise, employees who are trusting, with good attitude, and high willingness to learn should also be more willing and able to increase customer value by better meeting their needs (Moon & Kym, 2006). The higher the level of employee competence, the better they are at developing sustainable relationships with customers to meet their needs and ensure loyalty (St-Pierre & Audet, 2011). Thus, this study hypothesizes the following:

Hypothesis 1 Human capital has a positive effect on process capital.
Hypothesis 2 Human capital has a positive effect on customer capital.

Second, the internal process create and deliver the customer value proposition. In the current customer-oriented environment, to achieve good relationships with customers, companies generally maximize customer benefits by improving equality and reliability through internal process. In turn, the improvement in process capital positively influences company image, establishes loyalty among existing customers, and attracts new customers (Tseng & Goo, 2005; Wang & Chang, 2005; St-Pierre & Audet, 2011). Therefore, this study formulates the following hypotheses:

Hypothesis 3 Process capital has a positive effect on customer capital.

Finally, Lee and Wittelosstuijn (1998) proposed that the higher the customer satisfaction, the better the customer relationship, which in turn affects performance. Therefore, the management of companies should seek to maintain good relationship with customers in order to enhance performance (Banker et al, 2000; Tseng et al, 2013). Based on the argument above, it would be appropriate to infer that customer capital is closely linked to organizational performance. Stated formally,

Hypothesis 4 Customer capital has a positive effect on organizational performance.

3. Research Design

3.1 Data Collection and Variable Measures

The research data were collected for each quarter from 2003 to 2010. In Taiwan, after financial deregulation, set up excessive new banks caused vicious competition of banks, so small commercial banks were difficult to survive, and then the government passed the financial holding company (FHC) Act in July 2001 to encourage merging of financial institution and opening cross-business operation in order to achieve the goal of integration of financial industry. Due to independent banks cannot make cross sales and reduce cost if to compare the subsidiary banks of FHC, therefore, this study predict that relationship between IC and organizational performance has a large difference between independent banks and subsidiary banks of FHC. There are totally 15 FHC in Taiwan, and only 13 of them have subsidiaries with commercial banks, in order to make sure the sample period is consistence and to avoid sample selection biases. Excluding companies with insufficient data, there are 12 samples left for the subsidiary banks of FHC. On the other hand, this study selected 8 samples from independent banks. The final sample sizes were 352 for subsidiary banks of FHC and 215 for independent banks. The data for financial performance measurements were obtained from the Taiwan Economic Journal (TEJ) database, while non-financial measurements were manually collected from published sources such as annual reports and Market Observation Post System.

3.2 Endogenous Variables

In this study, organizational performance (OP) was measured as market value. Customer capital (CC) was measured as sales growth rate (SR), and process capital (PC) was measured as employee productivity (EP).

3.3 Exogenous/Predetermined Control Variables

Exogenous variables such as human capital (HC) were measured as average educational level of employees (AE). Otherwise, numerous predetermined control variables were used in the analyses to account for the alternative determinants of organizational performance, process capital, and customer capital, and these are as follows: net income (NI), total number of domestic bank branches (TB), deposit account (DA), quantity of automated teller machine (ATM), employee turnover rate (ER), and average age of employees (AE). The endogenous, exogenous, and predetermined control variable descriptive statistics are shown in Table 2.

Table 2: The Descriptive Statistics for Selected Variables (mean)

Variables	Subsidiary banks of FHC	Independent banks
Endogenous variables		
MV (in million NT$)	163,364.14	24,842.73
GR (%)	3.26	-0.03
EP (in million NT$)	15,529.93	1,305.21
Exogenous/predetermined control variables		
ED	0.57	0.93
NI (in million NT$)	982,872.14	471,532.36
DA (in million NT$)	786,047,483.93	397,041,712.40
TB	107.90	78.16
ER	0.07	0.04
AE	35.30	36.56

Notes: EP is measured as net operating revenues divided by total number of employees. Employees are categorized according to educational attainment such as master's degree, college, and high school or below, with the weight of 3, 2, 1, and 0, respectively, for each category in order to compute ED. ER is calculated as the number of employees who left the organization divided by the average employee headcount. This study does not claim that the IC indicators are optimal, or that there are no other indicators which are superior to these indicators. The reason for selecting these indicators is because they were shown to be value relevance in prior studies. (Wang & Chang, 2005; Cohen & Kaimeakis, 2007; Saeidi et al, 2014)

3.4 Simultaneous Equations

The conceptual model in Fig. 1 was tested using three-stage least square (3SLS) regression analysis. The 3SLS regression analysis provides consistent parameter estimates of models incorporating reciprocal causation and interdependent error terms (Intriligator, 1987). Therefore, this study used the following simultaneous equations because the set of hypothesized relationships shown in Figure. 1 among the factors across the three equations:

$$OP_{it} = \alpha_0 + +\alpha_1 CC_{it} + \alpha_2 NI_{it} + \varepsilon_{it} \quad (1)$$

$$CC_{it} = \beta_0 + \beta_1 HC_{it} + \beta_2 TB_{it} + \beta_3 DA_{it} + \beta_4 PC_{it} + u_{it} \quad (2)$$

$$PC_{it} = \gamma_0 + \gamma_1 HC_{it} + \gamma_2 ER_{it} + \gamma_3 AE_{it} + v_{it} \quad (3)$$

4. Empirical Results

The 3SLS regression results are presented in Table 3. In sum, the hypotheses were generally supported, and some interesting differences were uncovered. In particular, H1 and H2 were supported by subsidiary banks of FHC and independent banks. Meanwhile, H3 and H4 was supported by subsidiary banks of FHC only. The results regarding the predetermined control variables indicate that there are one significant relationships with net income in the subsidiary banks of FHC and independent banks. Banks with a high net income tended to enhance organizational performance. Moreover, subsidiary banks of FHC with a employee turnover rate also tended to increase process capital, but average age of employees were found to significantly and negatively correlate with process capital. With respect to TB and DA, the empirical results show that total number of domestic bank branches and deposit account were significantly and negatively correlated with customer capital in the independent banks.

Table 3: The 3SLS Regression Results

	Subsidiary banks of FHC			Independent banks		
	OP	CC	PC	OP	CC	PC
CC	0.72***			-0.66***		
	(3.11)			(-3.64)		
NI	0.19***			0.68***		
	(2.82)			(10.41)		
HC		0.12**	0.11**		0.01*	0.02*
		(12.10)	(14.11)		(1.68)	(1.71)
TB		0.00			-0.00***	
		(0.61)			(-6.57)	
DA		0.00			-0.00***	
		(0.97)			(-4.39)	
PC		0.01***			0.00	
		(7.19)			(1.21)	
ER			0.06***			0.00
			(2.71)			(0.93)
AE			-0.06***			-0.44
			(-2.87)			(-0.81)
R^2	44.07%			14.87%		

Notes: The coefficients in the table are standardized regression coefficients (beta coefficients) and the value in the parentheses of the table is the t-statistic. ***, **, * Denote coefficient estimates that are reliably significant at the 1%, 5%, 10% levels, respectively.

5. Conclusion

In this article, a model which linked human capital, process capital, and customer capital to organizational performance was developed. I summarized the similarities and differences among subsidiary banks of FHC and independent banks as follows. There is a basic difference between subsidiary banks of FHC and independent banks, specifically on the mediating role of customer capital.

For independent banks, the results indicate that customer capital is not a significant mediator of the relationship between process capital and organizational performance. Conversely, customer capital plays a significant mediating role between process capital and organizational performance for subsidiary banks of FHC. In spite of this difference, there are also important similarities between subsidiary banks of FHC and independent banks. That is, two of the four paths are significant and are in the hypothesized direction for subsidiary banks of FHC and independent banks: (1) the effect of human capital on process capital and (2) the effect of human capital on customer capital. This study expects bank management administrators to attach importance to IC through the result of the study and deeply consider the existential value of the bank itself and the direction of future development. As the model was empirically tested in the Taiwanese financial services industry, future studies could be conducted in other countries and financial institutions, such securities and insurance company, and compared with this study.

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