

Intellectual Capital, Financial Capital and Value Creation:

Evidence from China

Yan Jiang¹, Ning Mao²

(1. Nanjing University of Finance and Economics, China; 2. Nanjing University, China)

Abstract: There is no doubt that financial capital is important for a corporation's value creation. During the era of knowledge-based economy, intellectual capital is increasingly important for value creation. Based on trichotomies of intellectual capital, we take corporations of China as samples and build up four nesting models. The paper finds several results: (1) Financial capital is essential for performance and is the core among financial capital, human capital and performance. (2) Human capital influences corporate performance through the intermediary of relational capital and structural capital. (3) Intellectual capital is important to a corporation's sustainable development. Corporations should pay more attention to the cultivation and accumulation of IC for its increased long-term strategic performance.

Key words: intellectual capital; financial capital; performance; value creation; human capital; relationship capital

JEL codes: M12, M21, M40

1. Introduction

There is no doubt that financial capital is important for corporate value creation. Because of the emergence of knowledge-based economy at the end of the last century, experts began to focus more on some nonfinancial factors, such as human ability, new ideas, and customer satisfaction etc. Together, we can call these intellectual capital¹. To these intellectual capital elements, academe has come to an agreement which categorize intellectual capital as human capital, structural capital and relational capital. It has been recognized by many researchers and scholars². Human capital is defined as the knowledge, skill and experience of a business' staff and managers

Yan Jiang, Ph.D. in Accounting, Professor, School of Accounting, Nanjing University of Finance and Economics (NUFE); research areas/interests: corporate finance. E-mail: jiangy_njue@163.com.

Ning Mao, Ph.D. in Managment, Professor, School of Business, Nanjing University; research areas/interests: corporate finance. E-mail: Maong@nju.edu.cn.

¹ These non-financial factors can be called intangible assets (Annie Brooking, 1996), intelligence capital (Bontis, 1996; Agor, 1997; Grantham & Nichols, 1997; Stewart, 1997; Brooking et al., 1998), knowledge capital (Barney, 1986), and intangible capital (Jiangyan & Maoning, 2009). Despite the different names, they specifically refer to such resources that can create business value, but not directly measured in monetary. Concerning what Edvinsson (1997) points out — intelligence capital is non-financial capital, standing for the hidden value between market value and book value, this paper will adopt the name of intellectual capital for these non-financial factors in order to correspond the concept of financial capital.

² Some scholars advocate that human capital having clear subject of business property rights, can be accepted in ownership system. For example, the view of Human Capital Property Rights Theory proposed by Zhou Qiren (1996), Fang Zhuran (1997), Yang Jiguo (2002), Fu weining (2003), Zhou Guoqiang and Dai Changjun (2004) includes that human capital should have business property rights, the view of Joint Decision-making Theory proposed by Gorton and Schmid (2002) includes capital owners and workers

(Meichun Chen, 2001 translation). Also, it can be further divided into individual human capital and collective human capital. It represents all flow and stock of any given staff's knowledge capital. Structural capital is defined as enterprise-specific organizational processes, structure, strategy and culture, able to solve problems and create corporate value. It also represents the mechanism and structure of a business operation (Hubert, 1996). Structural capital is defined as the establishment, maintenance and development of good relations among businesses, customers, suppliers and partners. It is not only the source of corporate profit, but also the key to sustainable operation (Bontis, 1999).

From a corporate value creation perspective, Kaplan (1998) notes that valuation is the best standard of measuring corporate performance. Based on value creation, corporate performance can be divided into financial performance, which reflects short-term value creation, and strategy performance which in turn reflects long-term value creation, which also represents the sustainability of enterprise. Financial performance can be expressed by some financial indexes such as sales revenue growth and net profit growth. Strategy performance mainly reflects sustainable growth and future growth. These two performances form a complementary relationship, and are indispensible to enterprises.

The Balanced Scorecard put forward by Kaplan and Norton (1996) provides a good paradigm for the connection of financial factors and nonfinancial factors. It also presents a viewpoint that corporate performance originates from the coupling of financial factors and non-financial factors which should be recognized by management scientists and financial experts. Considering their own study field, management scientists and financial experts have more concern about the following issues: (1) With the increasing importance of intellectual capital for corporate value creation, does financial capital still play a leading role? (2) As one of the three factors of intellectual capital, can human capital create corporate value directly or is it necessary to go through intermediaries? (3) Which one is the most important for the sustainable development of corporate performance: financial capital or intellectual capital?

Concerning the first issue, GHM theory proposed by Grossman, Hart and Moore (1986, 1990) holds that corporate control right comes from the ownership of financial capital. Aghion and Bolton (1992) maintain that corporate control right should be allocated contingently. Managers, the owner of human capital, can obtain control right while the business runs well. Otherwise, investors, the owners of financial capital, obtain control. But viewpoint of Aghion and Tirole (1997) indicate they also acknowledge owner's achievement. Although managers having the advantages of information and knowledge hold the actual control right to operate the business resources, the scope of power will be bind by formal control right belonged to investors. However, the "Access Right" theory proposed by Rajan and Zingales (1998) argue that corporate control right comes from the control of meaningfully key resources that create corporate rent. These key resources include both financial capital and capital such as information, knowledge, new ideas and customer relationships. As a result, whether financial capital plays an essential role in China's corporate value creation is the main issue to be solved in our study.

Referring to the second issue, based on the rent-creating mechanism analysis³ of mutual conversion among the three elements of intellectual capital, human capital should be impacted on corporate performance after

co-control business.

³ The value-creating mechanism of intellectual capital is the integration of resource identification mechanism, capital-building mechanism and relationship-building mechanism, becomes effective economic rent through transformation among three elements of intellectual capital, and then creates business value. Human capital does not creates value until it is converted into relationship capital and structural capital which adapt to the environment (Yan Jiang & Ning Mao, 2004, 2007).

transforming. Bontis (1998, 2000) draws the same empirical conclusion as Steven Firer (2003). That is, human capital does not affect enterprise performance directly, but plays a role to enterprise performance through both relational capital and structural capital. Whether or not there will be such a positive conclusion in China is another issue to be concerned with.

Regarding the third issue, resource theory, competence theory and knowledge theory and etc. based on resource school have a profound study of the value creation mechanism by non-financial factors. Management scientists argue that intellectual capital, belonging to special corporate resource endowment, has some special characteristics, such as uneasy short-term duplication, the scarcity of imitation and innovation etc. It can also bring long-term business rentals through resource identification mechanisms, capacity building mechanisms, relationship establishing mechanisms, etc. (Madhok, Tallman, 1998; Makadok et al., 2001). Therefore, intellectual capital is more important to corporate strategy performance than financial capital. However, theoretical analysis cannot take the place of empirical research. How to test these viewpoints has become an urgent need in China.

For this reason, the paper uses structural equation model (SEM) designed four nested models based on the realistic data of Chinese enterprises and dedicated to answering these three issues. The remainder of the paper is organized as follows. Section 2 reviews the prior literature and develops hypotheses. Section 3 describes the methodology and procedure. In section 4, we analyze the results. Section 5 reports the empirical conclusions. In section 6 we present concluding comments.

2. Literature Review and Hypotheses Development

2.1 Financial Capital and Corporate Performance

Financial capital is undoubtedly necessary for corporate performance. Firstly, it is an indispensable factor of enterprises' production. Running a business begins with the investment of financial capital. Secondly, sufficient financial capital sends the market a strong positive signal of risk-resistance ability and investment capability, which can promote investors' confidence which will affect the corporate market price. The positive relationship of physical capital and the corporate market assessment has been proven not only by Firer and Williams (2003), but by some Chinese empirical analysis as well⁴. Financial capital investment affects an enterprise's financial performance such as sales growth and net profit growth, and plays an essential role in an enterprise's strategic investment as sufficient cash flow ensures the implementation of strategic investment planning. The right strategic investments, in turn, determine the capacity of the company's future value creation. Therefore, financial capital also affects the firm's strategic performance. Robert C. Higgins (1998) argues that, in terms of business's sustainable growth, although different people have different opinions about which financial resource limits the sustainable growth, one thing is certain that lack of financial resources will limits company's sustainable growth. Based on the analysis mentioned above, we develop the first hypothesis as follows:

H1: The greater the magnitude of financial capital investments, the greater the likelihood of increased business performance.

2.2 Intellectual Capital and Corporate Performance

Intellectual capital, as a special corporate resource endowment, has scarcity and innovation and can bring enterprises Ricardian rent and Schumpeterian rent which mainly reflects the value creation capability of

⁴ Li Jlaming and Li Fubinf's (2004) study finds that physical capital value-added rate has a significant positive correlation with business profitability.

intellectual capital. Moreover, the interaction and mutual transformation among these three elements can bring relationship rent, which builds on the basis of relationship. Dyer (1998) defined it as relationship rent that the value created by the combination of a certain resource with other resources that are often higher than that by itself. Compared to Ricardian rent and Schumpeterian rent, relationship rent is more durable. It can form sustainable value creation capacity. Therefore, intellectual capital is the main source of sustainable growth in corporate performance.

Harrison and Sullivan (2000) argue that enterprises can obtain various kinds of value from intellectual capital, including profit creation, strategic orientation, the ability to meet the demand for innovation, maintaining customer retention, reduced costs and improved productivity etc. Margaret Blair (2000) and Ahmed Riahi-Belkaoui (2003) studied the non- listed U.S. financial companies and multinational corporations and proved that there is a significantly positive correlation between intellectual capital and business performance⁵. Based on the analysis mentioned above, we develop the second hypothesis as follows:

H2: The greater the magnitude of intellectual capital promotion, the greater the likelihood of increased business performance.

According to the trichotomy of intellectual capital, this research hypothesis mentioned above can be further divided into the following three research hypotheses:

H2a: The greater the growth of human capital promotion, the greater the likelihood growth of increased business performance.

H2b: The greater the growth of relationship capital promotion, the greater the likelihood of increased business performance.

H2c: The greater the growth of structural capital promotion, the greater the likelihood of increased business performance.

2.3 Financial Capital and Human Capital

Financial capital impacts human capital mainly depends on the financial investment on human capital. The investment from financial capital on human capital mainly refers to such expenditure as employees' training, education and bonus, salary and welfare etc., maintains business competitiveness and makes up the cost of human capital. Jacob. Mincer (2000) clearly points out that human capital depreciates with age. He puts forward an human capital depreciation model, and claims that enterprises need continued investment in human capital. Job training, moderate flow and health investment are essential means of achieving an increased value of human capital. Becker (1987) in Human Capital also notes that such investment involves formal education investment, job training, health care, transfer cost and income information, etc. Stewart (1997) proposes one approach to human capital accumulation is to entail staff placement and to set up generous incentive allowance system. Carayannis and Alexander (1999) claim that companies should strive to develop the individual employee's knowledge and meld it with the organization's knowledge, thereby generating real value. Therefore, companies should provide more training and learning opportunities to individual employees. It is obvious that specific investment in human capital can increases employees' professional skills and knowledge, and enhances individual collaboration within groups and teams, greatly reducing the learning curve and improving the human capital stock.

⁵ Margaret Blair's (2000) study shows that the ratio of the business value of American publicly traded companies to intellectual capital is up to 70% (Patrick H. Sullivan, 2002). Ahmed Riahi-Belkaoui (2003) researches the intellectual capital of 81 American multinational companies, and finds that intellectual capital plays a role in American multinational companies.

Based on the analysis mentioned above, we present our third hypothesis as follows:

H3: The greater the magnitude of financial capital promotes, the greater the likelihood growth of human capital increases.

2.4 Human Capital, Relational Capital and Structural Capital

As the main elements of enterprise knowledge capital (that is, intellectual capital), the relationship among human capital, relational capital and structural capital is not a static phenomenon. Instead, it is a dynamic relationship of interaction and conversion, which constitutes the flow of a business' knowledge. Argyris and Schon (1978) suggest that the conversion of the intellectual capital elements, to and from individuals, teams and organizations involve not only the conversion of knowledge and skill, but the transfer of value. Ulrich, Todd and Marry (1993), for learning purposes, divide the dynamic transfer process of intellectual capital into four phases: creation, explicit-oriented, diffusion and institutionalization, which reflect the transformation path from human capital to structural and relationship capital among the three elements of intellectual capital. Guthrie (2001) maintains that the employee characteristics of human capital include skill, knowledge, creativity, initiative, and response capabilities, among other things. Its contribution to business performance entails solving customer problems, proposing innovative ideas and changing business processes. Therefore, there exists the conversion from human capital to relational capital. Lynn (1998) argues that if intellectual capital itself-based on characteristics of being soft and uneasy to quantify-is to generate hard quantifiable results, it needs to shape intellectual capital-the conversion from relational to structural capital. Johnson (1999) takes the software industry, as an example, discussing the dynamic relationship between the elements of intellectual capital from respective of flow, and points out the flow from relationship capital to structural capital.

According to Yan Jiang and Ning Mao (2007) empirical study, there is a mutual transformation among human capital, relational capital and structural capital. Nevertheless, the research of Bontis (1998), and Bontis et al. (2000) shows that it is structural capital and relational capital, not human capital, that have a significant influence on business performance. They believe that human capital impacts on business performance through structural capital and relational capital. Based on the analysis mentioned above, we present our fourth hypothesis as follows:

H4a: The greater the magnitude of human capital promotion, the greater the likelihood of relationship capital growth.

H4b: The greater the magnitude of relationship capital promotion, the greater the likelihood of structural capital growth.

3. Methodology

3.1 Research Design

This research designs five variables measuring financial capital (FC), human capital (HC), relational capital (RC), structural capital (SC) and business performance (PFC). Based on theories and the four sets of hypotheses, we design four nested models (Figure 1) to solve the three issues.



Figure 1 Four Nested Models

Model 1 reflects the impact of basic financial capital (FC) on corporate performance. On the basis of financial capital (FC), Model 2 introduces human capital (HC) and forms a triangular relationship. It shows that financial capital plays a direct role in business performance, as well as financial capital playing a role in business performance via human capital. Based on Model 2, Model 3 introduces relationship capital, demonstrating that human capital plays a role in business performance via conversion to relational capital. Based on Model 3, Model 4 introduces structural capital, which shows the conversion paths from human capital to relationship capital, and then to structural capital. In addition to analysing the role financial capital plays in business performance, Model 2, Model 3 and Model 4 analyse the path by which financial capital has taken effect on business performance through intellectual capital. It reflects the importance of intellectual capital to business value creation. This research tries to analyse the characteristics and changes of business performance by comparing the four nested models.

3.2 Questionnaire Analysis

Our research samples are obtained from questionnaires, mainly based on mature measurement scales, which are also syndicated from the theoretical foundation of empirical assumptions and China's conditions. The main body of the questionnaires is divided into two parts. The first part concentrates on analyzing the condition of financial capital and intellectual capital, measured by Likert's 7 Scale, and asks respondents in terms of the actual situation of the enterprise. The second part deals with the primary information of respondents and their working business. After designing the prototype questionnaire, we sent it to some relevant college faculties to fill in⁶. We then modified the questionnaire according to the feedback. Finally we get the problems meeting our request. The final volunteers were mainly senior business leaders from Jiangsu and Zhejiang Province, who are students in the EMBA Class, MBA Class and CEO programs of Nanjing University. We issued a total of 550 questionnaires, and received 126 valid questionnaires as a research sample. In order to ensure an unbiased sample, 2 years later, we again sent out 256 questionnaire copies, receiving 53 in return. We tested the research sample and the second

⁶ We invited nearly 20 faculties who come from five different universities such as Nanjing University, Nanjing University of Finance and Economics, Nanjing Forestry University, Nanjing Normal University to fill in the questionnaire in advance. Their main major are financial management, business management, accounting and auditing. They have engaged in teaching in more than 3 years. The percentage of Doctors and Doctor candidates is up to 60%.

sample separately with mean T-value. No significant difference in the test results signified that research sample was well represented.

According to the surveyed industries, the sample basically covering all the major sectors of the national economy has strong industry representation. According to the types of enterprise ownership, state-owned enterprises have the highest proportion, accounting for 41.3% of the total number of samples. Therefore, the research result is significant for the development of state-owned enterprises. According to the establishing time of the sample enterprises, the majority of them is old businesses, and well meets the research requirement. According to the distribution of capitalization, capital of the enterprises with more than 100 million RMB accounts for 66.7% of the total sample. This means the selected sample enterprises are the representative of large and medium-sized enterprises, and can well meet the research requirement. According to the position of the questionnaire volunteers, senior managers account for 86.5%, the majority of them have master degrees or are EMBA students. The volunteers have high academic knowledge and can better understand the content of the questionnaire.

3.3 Reliability, Validity and Factor Analysis

The questionnaire uses Cronbach' α -value to test reliability. Only when the α -value is equal to or greater than 0.7, is the questionnaire reliable. From the result of the reliability analysis (Table 1), in addition to the reliability of corporate performance variable, being equal to 0.7, the other four variables' are more than 0.8. This means variables among the various measurements have high internal consistency. Meantime, this questionnaire identifies research content and study variables on present theories and empirical analysis. During the design process, we consulted the views of relevant experts and researchers, using some preliminary tests by relevant college faculties and then adjusting them. Therefore, the items of the questionnaire can well fit the requirement of the models and has a high content validity.

Variable	Factor	Reliability (Cronbach'α)	Cumulative Explanation (%)	KMO
Financial Capital (FC)	al Capital (FC) Financial capital		66.802%	0.774
Human Canital (HC)	Individual HC	0.8720	70 754	0.828
Human Capital (HC)	Collective HC	0.8720	/0./34	
Relationship Capital (RC)	Cooperative relationship			0.852
	Cooperative resource	0.8989	71.616	
	Cooperative targets			
Structural Capital (SC)	Enterprise resource	0.9127	76.000	0.646
	Corporate philosophy	0.8137	/0.099	
Corporate Performance (PFC)	Corporate performance	0.6942	62.682	0.596

Table 1	Sample	Factor	Analysis
---------	--------	--------	----------

Aside from corporate performance being about equal to 0.6 from the variables' KMO, the other variables' value are all greater than 0.6 and fit for factor analysis. We use main component analysis during factor analysis and select indicators where the factor load value is greater than 0.55⁷. From the result of factor analysis⁸ (Table 1), we draw a fact from financial capital that can explain the total variance of 66.802% for the consideration of the

⁷ According to the relevant conclusions, there is weak correlation if factor's load value is less than 0.4. It is strong correlated if greater than 0.6. Others are moderately correlated. The load value of factors currently selected are all above 0.55. so we can make sure we basically reach the very significant standard that the study required.

⁸ We use 35 measurement items or indicators to analyze variables like financial capital, human capital, relationship capital, structural capital and business performance in data analysis. These indicators are also known as observation variables.

goodness fit of the structure equation model. Human capital extracts two factors of individual and collective human capital, which can explain the total variance of 70.754%. Relational capital extracts three factors of cooperative relationship, cooperative resource and cooperative target, which can explain the total variance of 71.616%. Structural capital extracts two factors of corporate resource and corporate philosophy, which can explain the total variance of 76.099%. Corporate performance indicators are brought into a single factor, which can explain the total variance of 62.682%.

4. Results

The four nested structure equation models⁹ created on Amos4.0 software show in Figure 2. The test results indicate that the four nested structure equations are recognizable, conforming to the premise of normal distribution of data as well as violate the estimated test conditions.



Figure 2 Results of Nested Models

***, **, * Significant at the 1%, 5 %, and 10% levels, respectively. Solid lines indicate regression paths are tenable. Dotted lines indicate regression paths are not tenable.

According to the analysis of Bagozzi and Yi (1988), structure equation should be tested from three aspects involving the basic fitting criteria, the overall model fit and fitting goodness of the model internal structure. According to the indicators of the overall fitting goodness of model structure equation¹⁰ (Table 2), X^2/df values inflecting the absolute fitting goodness from the four models are far below the standard 3 and RMSEA values are less than 0.1, which signaling a good fit. RFI value, CFI value, NFI value, and IFI value among the four models are all above 0.9, reaching the standard of 0.9. From the perspective of PCFI value, PNFI value, the PCFI value of

⁹ The main function of path analysis of structural equation model is to study the different relationship forms among variables. Compare with regression analysis, one of the main functions of path analysis is to separate variable interaction into direct effects and various forms indirect effects, and lets us understand causality among variables in the whole model system more specifically and deep. Therefore, Using structural equation can satisfy the analysis of the nested models in our study.

¹⁰ According to the fitting degree of whole model, Hairs etc. (1998) categorize it into absolute fitting degree measure which is mainly measured by X^2/df and RMSEA, incremental fitting degree measure mainly measured by RF, CFI, NFI and IFI, summary fitting degree measure mainly measured by PCFI and PNFI.

the four models all exceed an acceptable value of standard 0.5. Therefore, the fitting goodness of equations is all excellent. Additionally, according to analysis of the questionnaires, the four models, also, fully comply with study requirements from the basic fitting criteria and fit goodness of the models internal structure.

The Fit Goodness Indicators	Model1	Model 2	Model 3	Model 4
X^2	34.686	136.506	501.082	770.864
Р	0.015	0.000	0.000	0.000
X²/df	1.826	1.845	2.020	1.927
RMSEA	0.089	0.090	0.099	0.094
RFI	0.987	0.961	0.932	0.920
IFI	0.994	0.987	0.971	0.966
NFI	0.987	0.973	0.944	0.931
CFI	0.994	0.987	0.971	0.966
PNFI	0.521	0.685	0.781	0.801
PCFI	0.525	0.696	0.803	0.831

 Table 2
 Indicators of the Models

This study has set a total of four sets of assumptions, H1, H2a, H2b, H2c, H3 and H4. As can be seen from Figure 2, the four models all show that there is a significant positive correlation between financial capital and business performance. Namely, there exists the path relationship of FC \rightarrow PFC. The positive and significant path coefficient supports the H1, which further shows that the financial capital plays a significant role to produce business performance.

H2 is subdivided into three hypotheses. Model 2 shows the H2a, which is about the positive correlation of human capital and business performance, has not been supported by empirical results. This conclusion is consistent with the empirical conclusion drawn by Bontis (1998, 2000) and Steven Firer, which is about human capital does not play a direct role on business performance. Model 3 confirms H2b, that is, there exists the significant positive correlation of relationship capital and business performance. Model 4 demonstrates the significant positive correlation of structural capital and business performance and supports H2c.

H3, being about the correlation of financial capital and human capital, has been supported by empirical results through the model 2, the model 3, the model 4, namely, there exists the path relationship of FC \rightarrow HC. The positive and significant path coefficient shows the significant coefficient of financial capital and human capital.

H4 reveals the relationship among human capital, relational capital and structural capital. Model 3 and Model 4 all verify the establishment of H4a being about the significant positive correlation of human capital and relational capital. Model 4 verifies the establishment of H4b being about the significant positive correlation of relationship capital and structural capital.

5. Extensions

5.1 First Issue

The first issue we will answer is financial capital's status in business' practices in China and whether it still plays an important leading role during the growing importance of intellectual capital.

Model 1 reveals the establishment of the path relationship of FC \rightarrow PFC. Model 2 shows a triangular relationship, in which the path relationships of FC \rightarrow PFC and FC \rightarrow HC have been established, but the path relationships of HC \rightarrow PFC have been failed. For such a triangular relationship (Figure 3), Structural Holes Theory

put forward by Wolff (1964) and Burt (1992) gives a full analysis. They claim that the position of A-node, B-node, C-node is the same in a closed triangular systems while they have the opportunity to enjoy the same resources. However, the situation will be greatly changed if cutting off the link of the B-node and C-node in this triangular system. A-node which is contact with the other two parties has a special advantage under the competitive condition. Because it locates in the middle position of the other two separate points, it now can directly access to all the resources in the system while the two parties have to depend on the A-node to access these resources. Burt (1992) argues that A-node controls resource flow between the other two nodes, making it more powerful.



Figure 3 Closed and Unclosed Triangle System

Model 2 demonstrates that human capital having the direct impact on corporate performance is not established. This shows that financial capital (FC), compare to human capital (HC), is in a more powerful position. Since human capital plays an increasingly important role in value creation, the discussion about human capital property right becomes greatly striking. However, the establishment of H1 indicates financial capital still plays an important role in China's current business' practice and Model 2 further explains that financial capital locates at the core position among this triangular relationship. From the perspective of control right, financial capital funders (shareholders) and their spokesmen (Board of Director), compare to key employees or senior managers (non-shareholding staffs) still in a dominant position and play an important leading role in the production of business performance.

5.2 Second Issue

The second issue we will answer is whether human capital plays a direct role in business' value creation or impacts on business' performance through other intermediaries.

Model 2 indicates that the path relationship of HC \rightarrow PFC is not established, namely, there is not a significant positive relationship between human capital and business performance. After introducing RC by Model 3, the path relationship of HC \rightarrow RC \rightarrow PFC is established. Model 4 shows the path relationship of HC \rightarrow RC \rightarrow SC \rightarrow PFC is established. The test of H2a also shows that human capital does not play a direct role in business performance, but does play a role through relationship and structural capital. To further illustrate the problem, we design a new model 3a (Figure 4 and Table 3). Compare to Model 3, this model introduces the path HC \rightarrow PFC. However, from test results, this path is still not established (the path coefficient is -0.11 and the P-value is 0.590).



Model 3 indicates the establishment of the path relationship of RC \rightarrow PFC, while Model 4 shows the establishment of the path relationship of RC \rightarrow SC \rightarrow PFC. This shows that relationship capital in the transformation process can either directly influence on business performance or through structural capital. To further illustrate the problem, we design a new Model 4a (Figure 5 and Table 3), indicating the path relationship of RC \rightarrow PFC. The path coefficient of Model 4a is 0.21, compared with Model 3 which path coefficient of RC \rightarrow PFC is 0.41, is decreases by 0.2. However, the P-value increases from 0.018 to 0.248, namely, from an original significant correlation to a weak correlation. Based on the discriminated method proposed by Baron and Kenny (1986), we know this situation means that structural capital has played a partial, not complete, intermediary role between relational capital and business performance.¹¹ In the process of directly creating business value, relationship capital can also indeed create business value through structural capital.



Bontis et al. (1998, 2000) draw the conclusion that human capital has no significant effect on business performance in Canada, Malaysia and other countries and the inference that human capital has an impact on business performance through relational capital, which also is established in China. Considering the similar conclusion drawn by Steven Firer's (2003) empirical research, although there are not large scale empirical study around the world, the fact that human must be taken effect through intermediary can explain the reason why corporations own a lot of rich human resource but could not achieve sustainable growth.

The Fit Goodness Indicators	X ²	Р	X²/df	RMSEA	RFI	IFI	NFI	CFI	PNFI	PCFI
Model 3a	500.784	0.000	2.027	0.099	0.932	0.971	0.944	0.971	0.777	0.799
Model 4a	769.690	0.000	1.926	0.094	0.920	0.966	0.931	0.966	0.777	0.828

Table 3Indicators of Model 3a and Model 4a

5.3 Third Issue

The third issue we will answer is which element is more crucial to the sustainable growth of business' performance, intellectual capital or financial capital.

This study measured the variable "business performance" by P1, P2 and P4 indicators¹², in structure equation, the indicators' path coefficient for variables reflects the degrees the indicators influences on the variables. What P1 indicator and P2 indicator measure is the short-term financial performance of the enterprise while what P4 indicator measures is the long-term strategic performance of the enterprise. Model 1 only reflects that financial

¹¹ Whether C-node plays an entirely intermediary role between A-node and B-node must meet the following conditions: each two are significant correlated; the relationship between A-nod and B-node will be disappeared while we add C-node to analyze.

¹² P1 indicator reflects the growth rate of sales. P2 indicator reflects changes in after-tax profit. P3 indicator reflect business overall competitiveness. P4 indicator reflects business future growth force and competitiveness. P3 indicator was deleted as the irrational item in the process of fitting equation.

capital affects business performance. Model 2, Model 3, Model 4 gradually introduce the elements of intellectual including human capital, relational capital and structural capital. With the gradual introduction of the elements of intellectual capital, the value of P1 indicator followed by 0.76, 0.75, 0.69, 0.63 (Figure 2) declines progressively, the same as the value of P2 indicator followed by $0.85 \\ 0.83 \\ 0.81 \\ 0.73$ (Figure 2), while the value of P4 indicator followed by $0.85 \\ 0.83 \\ 0.81 \\ 0.73$ (Figure 2), while the value of P4 indicator followed by 0.69 (Figure 2) shows a gradual upward trend. This demonstrates that with the gradual introduction of intellectual capital (knowledge capital), business performance is increasingly inclined to reflect long-term performance. Although these trends are slow, the view of knowledge theory can be confirmed in the practice of China's business. That is, financial capital mainly plays a role in business' short-term financial performance, while intellectual capital, the main source of business' sustainable growth, mainly plays a role in business' strategic performance.

The establishment of H1 testifies that financial capital is essential to business performance, the importance is changing yet. The correlation coefficient of the path FC \rightarrow PFC in Model 1 and Model 2 stabilizes at 0.7 or above (Figure 2, the path coefficients are 0.76, 0.72). The correlation coefficient of the path FC \rightarrow PFC in Model 3 and Model 4 stabilizes at 0.5 or above (Figure 2, the path coefficients are 0.56, 0.51). This shows that financial capital has a certain stability to influence on business performance. However, such stability does not remain unchanged, it will be declined with the increasing of the element of knowledge.

6. Conclusions

In this study, we seek to analyze the relationship between financial capital and intellectual capital in the process of business value creation. Firstly, from the empirical results, we can observe that financial capital continues to play an important and certain stable role in China's enterprises. Compare with human capital, financial capital is still in a key position. This shows financial capital is not and should not be overlooked if China's enterprises want to enhance their value creating capacity.

Secondly, as for value creation, we are more concerned about the business' sustainable growth being more meaningful for business than the increase of the size of sales and also the ultimate goal of business' development. Despite we could not ignore that financial resource is essential to business growth, the sustainable growth of business performance depends more on the intellectual capital. Therefore, only inputting financial capital would make our growth a low efficiency, and extensive. If enterprises want to create long-term strategic performance, they should focus more on the accumulation and investment of knowledge elements as intellectual capital etc.

Thirdly, the conclusion that human capital cannot create business performance also makes us realize that the creation of business performance is a systematic project and there is a mutual influence and transformation among driving factors affecting the business' value. Human capital cannot be made the best use until it is translated into the relationship capital and structural capital which are adapted to the business system. Actually, business value creating is achieved by intercoupling and interacting of financial capital and intellectual capital.

Acknowledgements

Yan Jiang acknowledges financial support from National Natural Science Foundation of China on the project of "Carbon disclosure, carbon performance and market reaction: research based on China" (71272237).

References

- Argyris C. and Schon D. A. (1978). Organizational Learning: A Theory of Action Perspective, Addison-Wesley Reading, MA.
- Baron R. M. And Kenny D.A.(1986). "The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations", *Journal of personality and social psychology*, Vol. 51, No. 6, pp. 1173-1182.
- Becker G. S. (1993). Human capital, The University of Chicago Press.
- Bontis N. (1996). "There's a price on your head: managing intellectual capital strategically", *Business Quarterly*, Vol. 60, No. 4, pp. 40-78.
- Bontis N. (1998). "Intellectual capital: an exploratory study that develops measures and models", *Management Decision*, Vol. 36, No. 2, pp.63-76.
- Bontis N. (1999). "Managing organizational knowledge by diagnosing intellectual capital: framing and advancing the state of the field", *International Journal of Technology Management*, Vol. 18, pp. 433-462.
- Bontis N., Keow W. C. C. and Richardson S. (2000). "Intellectual capital and business performance in Malaysian industries", *Journal* of Intellectual Capital, Vol. 1, No. 1, pp. 85-100.
- Brennan N. and Connell B. (2000). "Intellectual capital: current issues and policy implications", *Journal of Intellectual Capital*, Vol. 1, No. 3, pp. 206-240.
- Buren M. E. V. (1999). "A yardstick for knowledge management", Training & Development, Vol. 53, No. 5, pp.71-78.
- Burt R. S. (1992). Structural Holes, Harvard University Press.
- Carayannis E. G. and Alexander J. (1999). "Wealth of knowledge: converting intellectual property to intellectual capital in co-opetitive research and technology management settings", *International Journal of Technology Management*, Vol. 18, No. 3, pp. 326-352.
- Chen M. C. (2001). "An research on the effects of information technology investment and intellectual capital on business performance", master's thesis, Institute of Information Management, Taiwan National Central University.
- Dzinkowski R. (2000). "The value of intellectual capital", The Journal of Business Strategy, Vol. 21, No. 4, pp. 3-4.
- Edvinsson L. and Malone M. S. (1997). Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower, Harper Business.
- Edvinsson L. and Sullivan P. (1996). "Developing a model for managing intellectual capital", *European Management Journal*, Vol. 14, No. 4, pp. 356-364.
- Firer S. and Williams S. M. (2003). "Intellectual capital and traditional measures of corporate performance", *Journal of Intellectual Capital*, Vol. 4, No. 3, pp. 348-360.
- Grantham C., Nichols L. and Schonberner M. (1997). "A framework for the management of intellectual capital in the health care industry", *Journal of Health Care Finance*, Vol. 23, No. 3, pp. 1-19.
- Guthrie J. (2001). "The management, measurement and the reporting of intellectual capital", *Journal of Intellectual Capital*, Vol. 2, No. 1, pp. 27-41.
- Guthrie J. and Petty R. (2000). "Intellectual capital: Australian annual reporting practices", *Journal of Intellectual Capital*, Vol. 1, No. 3, pp. 241-251.
- Heng M. S. H. (2001). "Mapping intellectual capital in a small manufacturing enterprise", *Journal of Intellectual Capital*, Vol. 2, No. 1, pp. 53-60.
- Higgins R. C. (1998). Financial Analysis, Peking University Press, Beijing.
- Hubert S. O. (1996). "Tacit knowledge: The key to the strategic alignment of intellectual capital", *Strategy and Leadership*, Vol. 24, No. 2, pp. 10-15.
- Jacob M. (2001). Research on Human Capital, China Economic Press, Beijing. (in Chinese)
- Jiang Y. and Mao N. (2004). "Financial discussion about network-based development", *Journal of Accounting Research*, No. 7, pp. 30-34.
- Jiang Y. and Mao N. (2007). "Multi capital structure: An evidence come from China", China Industrial Economy, No. 1, pp. 80-87.
- Johnson W. H. A. (1999). "Integrative taxonomy of intellectual capital: measuring the stock and flow of intellectual capital components in the firm", *International Journal of Technology Management*, Vol. 18, No. 5-8, pp. 562-575.
- Kaplan R. S. and Norton D. P. (1996). *Translating Strategy into Action: The Balanced Scorecard*, Harvard Business School Press, Boston, MA.
- Li J. M. and Li F. B. (2004). "Empirical analysis of corporate intellectual capital and corporate performance", *Journal of Chongqing University*, No. 12, pp. 134-138.

- Leif E. and Malone Michael S. (1997). Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower, Harper Business.
- Liebowitz J. and Suen C. Y. (2000). "Developing knowledge management metrics for measuring intellectual capital", *Journal of Intellectual Capital*, Vol. 1, No. 1, pp. 54-67.
- Lynn B. E. (1999). "Culture and intellectual capital management: A key factor in successful ICM", International Journal of Technology Management, Vol. 18, No. 5-8, pp. 590-603.
- Madhok A. and Tallman S. B. (1998). "Resources, transactions and rents: Managing value through interfirm collaborative relationships", *Organization Science*, Vol. 9, No. 3, pp. 326-339.
- Makadok R. (2001). "Toward a synthesis of the resource based and dynamic capability views of rent creation", *Strategic Management Journal*, Vol. 22, No. 22, pp. 387-401.
- Nonaka I. and Takeuchi H. (2007). "The knowledge-creating company", Harvard Business Review, Vol. 852, No. 7-8, pp. 162-171.
- Riahi-Belkaouil A. (2003). "Intellectual capital and firm performance of US multinational firms: A study of the resource-based and stakeholder views", *Journal of Intellectual Capital*, Vol. 4, No. 2, pp. 215-226.
- Robinson J. C. (1998). "Financial capital and intellectual capital in physician practice management", *Health Affairs*, Vol. 17, No. 4, pp. 53-74.
- Roos G. and Roos J. (1997). "Measuring your company's intellectual performance", *Long Range Planning*, Vol. 30, No. 3, pp. 413-426.
- Sr Patrick H. Sullivan and Harrison S. (2000). "Profiting from intellectual capital: Learning from leading companies", Journal of Knowledge Management, Vol. 1, No. 1, pp. 132-143.
- Stewart T. and Ruckdeschel C. (1998). "Intellectual capital: The new wealth of organizations", *Performance Improvement*, Vol. 37, No. 7, pp. 56-59.
- Ulrich D., Von Glinow M. A. and Jick T. (1993). "High-impact learning: Building and diffusing learning capability", *Organizational Dynamics*, Vol. 22, No. 2, pp. 52-66.
- Winter S. G. (2000). "The satisficing principle in capability learning", *Strategic Management Journal*, Vol. 21, No. 10-11, pp. 981-996.