

# **An Empirical Study on the Impact of Enterprise Knowledge Capital Investment and Intellectual Capital on Firm Performance**

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**Abstract:** In the era of knowledge economy, intellectual capital has surpassed physical capital and has become the fundamental driving force for the existence and development of enterprises. Based on this, the article empirically studies the impact of corporate intellectual capital investment and intellectual capital on corporate performance. Based on the simple analysis of the research progress of enterprise intellectual capital investment, the paper analyzes the contribution of intellectual capital investment to corporate performance, and enhances the confidence of enterprise managers in intellectual capital investment to strengthen intellectual capital investment and management.

## **1. Introduction**

Chinese enterprise IT investment is growing rapidly. The development of enterprise information brings a broad space for growth for Chinese enterprises' IT investment [1]. China's industrial policy promotes the growth of corporate IT investment. According to CCW Research's research on China's IT investment market, China's total IT spending in 2004 was 286.52 billion yuan, a year-on-year increase of 13.7%. The total IT expenditure of enterprises was 162.75 billion yuan, accounting for 56.8% of China's total IT expenditure [2]. Chinese enterprise IT investment is growing rapidly. The development of enterprise information brings a broad space for growth for Chinese enterprises' IT investment. China's industrial policy promotes the growth of corporate IT investment. China's R&D expenditures accounted for an increase in the proportion of GDP, among which the main position of corporate R&D activities was consolidated, and the proportion of Chinese R&D funds from corporate funds increased further [3]. Chinese enterprises have a "black hole" in IT investment. Many enterprise managers regard IT as a "black box" and lack confidence in IT investment, resulting in many IT investment monitoring failures. The proportion of China's R&D investment in GDP is still low [4]. The proportion of R&D investment in sales revenue and industrial added value is still low. Especially, the proportion of high-tech industry R&D investment in industrial added value is more low.

## **2. Knowledge Capital Related Theory**

With the development of knowledge economy, enterprise knowledge capital investment, including enterprise IT investment, enterprise R&D investment and enterprise employee training investment, has been an indirect and complex impact on corporate performance [5]. Intellectual capital is the core competitiveness that translates into corporate intellectual property and intellectual assets [6]. Western scholars' research on technology-intensive enterprises such as the IT industry has found that its asset market value far exceeds its book value, and the difference between the two is an important manifestation of the value of intellectual capital [7]. Stewart (1991) defines intellectual capital as: "The sum of things that all members of the company know can give companies a competitive edge in the market."

On the basis of learning from Western research experience, domestic scholars have formed their own views on the study of intellectual capital: intellectual capital is a capitalized knowledge element with high value-added knowledge that can be involved in the social reproduction cycle [8]. Domestic research on the relationship between intellectual capital investment and corporate

performance started late and progressed slowly [9]. The R&D expenditure of large and medium-sized industrial enterprises in China has a lagging effect on the output performance of enterprises (the lag time is about 3 years), and the output elasticity is 0.35-0.44. Overall, the current research is only based on simple descriptions of phenomena and general qualitative analysis, and does not specify the relationship between the various elements of intellectual capital investment and the impact on business performance [10]. Scholars have made a lot of efforts on the issue of intellectual capital on corporate performance. Although the conclusions are not consistent, this may be related to the development of different markets and the development of enterprises, but the research results mostly support enterprise knowledge. The assumption that capital has a positive impact on firm performance. This is also a realistic embodiment of intellectual capital playing an important role.

### **3. An Empirical Study on the Impact of Enterprise Knowledge Capital Investment and Intellectual Capital on Firm Performance**

#### **3.1. Research models and assumptions**

The model of this paper includes three elements: intellectual capital investment, intellectual capital and enterprise performance, and five specific elements.

Intellectual capital investment is to increase the expenditure and expenditure of the accumulation of intellectual capital. Although there are many forms that can increase the expenditure and cost of enterprise intellectual capital accumulation, this paper only discusses three main forms: enterprise IT investment, that is, the expenditure and expenditure of enterprises on information and communication technology projects; enterprise R&D investment, that is, enterprises Expenditure and expenditure on research and development projects; corporate T&D investment, which is the expenditure and expenditure of the company on employee training and development.

Knowledge capital is the core element of the model and plays a role as a bridge between the connection between intellectual capital investment and corporate performance. This paper uses Marr and Schiuma's definition of intellectual capital: "Intellectual capital is an intellectual property that belongs to the organization and has the most significant contribution to improving the competitive position of the organization by increasing the value of key stakeholders." This paper uses MERITUM to classify intellectual capital: human capital refers to the knowledge, skills and experience that employees have to take away; structural capital is the knowledge of the enterprise, including organizational practices, procedures, systems, cultures and databases; It is all resources that connect the company with external customers, suppliers and research and development partners.

Corporate performance refers to the results of business operations and the effects on stakeholders. "Results of business operations" are past business results and current financial quality, ie financial performance. "Effects on corporate stakeholders" is the utility of stakeholders such as investors, creditors, customers and employees, ie corporate value.

This paper analyzes the related research literature on the relationship between enterprise knowledge capital and firm performance, the relationship between enterprise knowledge capital investment and firm performance, and draws on the framework of the relationship between knowledge capital investment and firm performance. . The conceptual model established in this paper is shown in Figure 1.

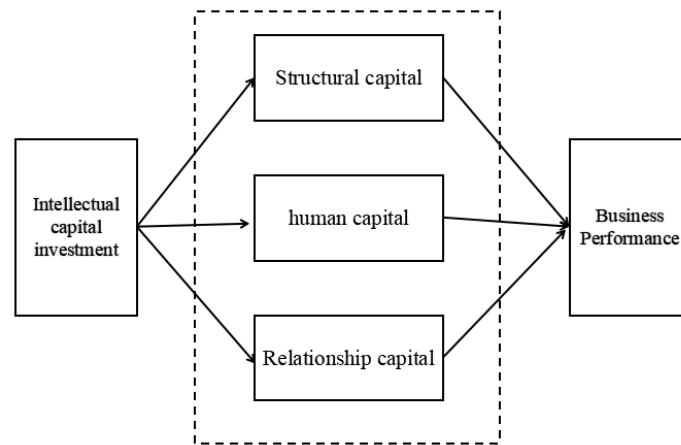


Fig.1. Analysis model

The research hypothesis is put forward: the larger the enterprise knowledge capital investment, that is, the larger the enterprise IT investment, R&D investment and T&D investment, the larger the enterprise structural capital, and the positive correlation between the two. The greater the investment in enterprise knowledge capital, that is, the greater the enterprise IT investment, R&D investment and T&D investment, the greater the human capital of the enterprise, and the positive correlation between the two. The greater the investment in enterprise knowledge capital, that is, the greater the enterprise IT investment, R&D investment and T&D investment, the greater the corporate relationship capital, and the positive correlation between the two. The greater the corporate structure capital, the higher the company's performance, and there is a positive correlation between the two. The greater the human capital of the enterprise, the higher the enterprise performance and the positive correlation between the two. The greater the corporate relationship capital, the higher the company's performance, and there is a positive correlation between the two. The greater the human capital of the enterprise, the greater the structural capital of the enterprise and the positive correlation between the two. The greater the human capital of the enterprise, the greater the corporate relationship capital, and the positive correlation between the two.

### 3.2. Research design

The measurement of intellectual capital investment is to select variables to measure enterprise intellectual capital investment. This paper selects “the ratio of information technology project expenditure to sales revenue” to measure enterprise IT investment, selects “research and development project expenditure as a percentage of sales revenue” to measure enterprise R&D investment, and selects “employee training and development expenditure as a percentage of sales revenue”. Corporate T&D investment. Structural capital is divided into three parts: technical level, management system and corporate culture. Human capital is divided into two parts: employee ability and employee attitude. Relationship capital is divided into two parts: customer relationship and supply relationship. The measurement variables of customer relationship are product brand awareness, product market ranking, customer satisfaction and dealer satisfaction. The measurement variables of the supply relationship are supplier satisfaction, company visibility, and company credit rating.

A path analysis method is used to verify whether the hypotheses in this research model are supported. In the path analysis, firstly, based on the relevant theory and literature, a model can be verified and a path graph without path coefficients is drawn. The causal relationship in the path graph is indicated by an arrow, the arrow points to “fruit (dependent variable)”, and the beginning of the arrow is “independent (argument)”. Then select the appropriate regression model, usually using the Enter method, to estimate the path coefficient and test whether it is significant, and then estimate the residual coefficient. In path analysis, multiple regression analysis is used, and the “path coefficient” (usually marked next to the arrow) is the “normalized regression coefficient (Beta value)” in the regression equation. A significant path coefficient verifies that the causal relationship

at the two ends of the path (arrow) is true, and the hypothesis is also supported empirically.

### 3.3. Results and analysis

The above proposed methods are used to verify the models and assumptions presented in this paper. The results of this study hypothesis are shown in Table 1.

Table 1 Model analysis result

Hypothetical causation	Validation results			
	Hypothetical direction	Significant	Fitting result	Conclusion
Intellectual capital investment→Structural capital	Consistent	Significant	better	correct
Intellectual capital investment→human capital	Consistent	Not obvious		error
Intellectual capital investment→Relationship capital	Consistent	Not obvious		error
Structural capital→Business Performance	Consistent	Significant	good	correct
human capital→Business Performance	Consistent	Significant	good	correct
Relationship capital→Business Performance	Consistent	Significant	good	correct
Human capital→Structural capital	Consistent	Not obvious		error
Human capital→Relationship capital	Inconsistent	Not obvious		error

The model verification results show that the enterprise knowledge investment has an impact on the structural capital. Increasing investment in information technology, increasing research and development investment, and increasing employee training and development investment will increase the management and cultural level, product quality level and product technology level of enterprises. From the results of relevant analysis, intellectual capital investment has the greatest effect on management and culture, second on product technology and lowest on product quality. There is a positive correlation between corporate intellectual capital investment and structural capital, which supports the discussion of information technology, research and development, and training and development to promote corporate structural capital. The enterprise intellectual capital investment in this research includes enterprise IT investment. Therefore, there is a positive correlation between corporate intellectual capital investment and structural capital, which supports the framework of corporate IT investment through corporate processes on corporate performance and corporate value.

The model verification results show that the enterprise intellectual capital investment has an impact on human capital and relational capital, but it is not significant. Although the effect of intellectual capital investment on human capital and relationship capital has not passed the significant test, there is a certain positive correlation coefficient between intellectual capital investment and human capital and relational capital. The correlation coefficients are 0.270 and 0.223, respectively. Impact.

Structural capital has a significant impact on business performance, indicating that management and cultural level, product quality and product technology level will improve corporate performance. The verification results support the relevant discussion and empirical conclusions on the impact of structural capital, such as corporate culture, human resource management, property rights system, information technology, quality management and certification, on corporate performance.

The results of model verification show that intellectual capital investment has a significant impact on corporate performance through structural capital, which indicates that the increase of corporate IT investment, R&D investment, and T&D investment has increased the level of corporate management and culture, product quality and product technology. Improve business performance.

Intellectual capital investment has an impact on corporate performance through human capital and relational capital, but it is not significant. Although human capital and relational capital have a significant impact on corporate performance, intellectual capital investment has no significant effect on human capital and relational capital, thus blocking the channel of intellectual capital investment through the influence of human capital and relationship on firm performance. . Although the impact of intellectual capital investment on corporate performance through human capital does not meet significant requirements, this path still has a certain positive impact.

#### **4. Conclusion**

The impact of intellectual capital on firm performance has far-reaching implications. The article uses empirical analysis methods, Yan Zeng has a positive impact on intellectual property investment and knowledge investment on corporate performance. Utilizing and improving the value of the company's intellectual capital is a problem that all enterprises that want to gain an advantage in the future competition. Knowledge capital exists in the talents of the enterprise, but the enterprise can also reduce it by establishing a standardized process and management system. The dependence on people, the same enterprise should also weigh the balance between the rest of the company's capital and intellectual capital to play a more effective role in the future development of the enterprise. This is not only a problem faced by enterprises, but also a subject that the academic community should pay more attention to.

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