

## **Optimizing the effects of intellectual capitals on business performance and corporate value in MICE industry**

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### **Abstract**

In the era of knowledge economy, there are increasing enterprises getting rid of the business pattern of evaluation with tangible assets of land, factory buildings, and facilities, but turning to emphasize intangible assets of customer relationship, patents, brands, and service. Intangible assets are the so-called “intellectual capitals (IC)”. Since traditional balance sheets can no longer completely present the true value of an enterprise, it requires the research on intellectual capitals to redefine a brand-new corporate value measurement standard. Traditional balance sheets could not measure corporate value, and the added value is shown after the disposal, authorization, merger, or sale of an enterprise. Corporate mergers have been the tactic to execute business strategy and resource reallocation that intellectual capitals should be evaluated during corporate mergers. Intellectual capitals therefore become more importance.

Listed companies in MICE industry in 2014~2023 QIN (Chinese enterprise financial information analysis database) are selected as the research samples, where those with incomplete data are deleted to receive 102 sampled companies. The research results show that 1.intellectual capitals present positive effects on business performance, 2.intellectual capitals reveal positive effects on corporate value, and 3.organizations in MICE industry could manage the intellectual capitals with the continuous interaction among manpower, structure, and relationship capital to effectively develop the complete knowledge basis. According to the results to propose suggestions, it is expected to better understand the completion of resource building in MICE industry and, from the indicator results, understand the advantages and disadvantages to assist in the strategy adjustment in MICE industry.

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**Subject Classification:** 62H30, 91G80.

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## Introduction

Human economic system has changed the era of agricultural economics and industrial economics into a knowledge-based “knowledge economy era” since the 21<sup>st</sup> century [1]. Enterprises create value from tangible factors of production, like land, labor, and machine, to knowledge-centered intellectual capitals. Besides, the changes in information technology and global competition trends have enterprises encounter fiercer competition than ever. Along with knowledge economy, the creation of corporate value changes from tangible assets management into intangible assets management [2]. For knowledge-based enterprises, the creation, accumulation, share, and integration of knowledge is the key factor in value creation. To achieve the sustainable development of an enterprise, the creation, management, measurement, and evaluation of the core resource, “intellectual capitals”, is the important concept for future corporate competition [3]. Since traditional balance sheets could not completely present the true value of an enterprise, a brand-new corporate value measurement standard should be redefined through the research on intellectual capitals. Traditional balance sheets could hardly measure corporate value, and the added value is shown after the disposal, authorization, merger, or sale of an enterprise. As corporate mergers have become the tactic to execute business strategy and resource reallocation, it is necessary to evaluate intellectual capitals during corporate mergers that intellectual capitals become more important [4]. Along with the rapid development of knowledge-based products and service, knowledge base plays an extremely important role in the competitive advantage of an enterprise, where the core of knowledge accumulation and transformation is intellectual capitals [5]. Especially, when machine equipment and factory buildings are aging, increasing intellectual capitals along with an enterprise become the most valuable assets of the company [6]. New economic development foundation depends more on intangible assets of an enterprise. For this reason, current industry and academia attempt to seek a method to measure and manage such intangible assets, expecting to continuously maintain and reinforce the competitiveness in such an era with rapidly changing economic structure. Intangible assets are gradually emphasized mainly because the growth of total factor productivity in various countries is caused by knowledge investment. Physical capitals could not explain such a phenomenon. Regarding enterprises, traditional accounting systems simply stress on tangible assets, while ntangible assets could not be easily quantified to result in under-estimated corporate value,

revealing the difference between market value and book value. It means that traditional accounting systems could not effectively measure the intangible assets of an enterprise. Intellectual capitals are not simply the presentation of resources, but take the transformation of resources into account and create organizational value through the transformation process. Such a process is organizational strategy [7]. Accordingly, intellectual capital measuring system starts from the viewpoint of overall strategy of an enterprise and is the tool to measure and implement corporate strategies. Conference and exhibition service industry is a global industry with emerging potential, presenting the “three high, three big, three advantage” characteristics (high innovation benefits, high added value, and high growth potential; big output value, big job opportunity creation, and big industrial correlation; manpower comparative advantage, technology comparative advantage, and assets utilization advantage). For international trade or domestic trade, the meeting, incentive, convention, exhibition industry (MICE), in past years, is the service industry formed by enhancing multiple economic developments, presents excellent development potential and added value, and reveals unfathomable benefits and output value for related businesses [8]. As a result, this study discusses the effect of intellectual capitals on business performance and corporate value in MICE industry, expecting to better understand the completion of resource building in MICE industry and realize the advantage and disadvantage from the indicator results to assist MICE industry in the strategy adjustment.

### **Literature review**

Most past research regarded positive effects of intellectual capitals on business performance of an enterprise [9]. An enterprise being dedicated to enhancing intellectual capitals would promote the business performance [10]. Intellectual capitals showed significantly positive correlations with traditional financial performance and market value. Past research results also revealed that intellectual capitals might enhance the innovation performance of an organization. For instance Cegarra-Navarro & Martelo-Landroguez [11] considered that innovation culture in organizational capitals (i.e. structure capital discussed in this study) would affect organizational innovation capability. Obeidat et al. [12]. Also proposed that organizational capitals were composed of innovation capital and process capital; the former referred to the innovation ability of an organization to protect commercial rights, intellectual property, as well as

other intangible assets and talent used for developing and accelerating the new products and new service appearing on the market. In this case, organizational capitals could be the source of corporate innovation performance. In short, intellectual capitals might present positive effects on business performance. According to above arguments, the following hypotheses are proposed in this study.

H1: Intellectual capitals present positive effects on business performance.

H1-1: Manpower capital in intellectual capitals shows positive effects on business performance.

H1-2: Structure capital in intellectual capitals reveals positive effects on business performance.

H1-3: Relationship capital in intellectual capitals presents positive effects on business performance.

Majid et al. [13] mentioned that the value of an enterprise with R&D and advertising expenses was given positive evaluation in the market and intellectual capitals revealed remarkably positive correlations with corporate value. Shafique et al. [14] found out the notable and positive deferred effect of research development on surplus and share price in the US enterprises. Clauss et al. [15] proved the significantly positive correlations of surplus, net worth, book intangible assets, and R&D expenditure with corporate value. Hayaeian et al. [16] and Patil et al. [17] discovered that intellectual capitals were the main factor in realizing the relationship network building of an enterprise in the growth period; it did not simply effectively make up the resources required for corporate development, but could also excite innovation capital and structure capital through human resource and constantly reinforce the original relationship capital of an enterprise to eventually effectively promote corporate value and realize the virtuous circle of corporate value creation activity [18]. From above arguments, the following hypotheses are further proposed in this study.

H2: Intellectual capitals reveal positive effects on corporate value.

H2-1: Human resource in intellectual capitals shows positive effects on corporate value.

H2-2: Structure capital in intellectual capitals presents positive effects on corporate value.

H2-3: Relationship capital in intellectual capitals reveals positive effects on corporate value.

## **Research dimension definition and research method design**

### *I. Research dimension definition*

#### *(1) Intellectual capitals*

Referring to Zhou et al. [19], the proxy variables of the three dimensions of intellectual capitals (human resource, structure capital, relationship capital) are used as the representatives.

1. Human resource dimension: “labor force”, “labor quality”, “labor experience”, “labor cost”, and “labor contribution”.
2. Structure capital dimension: “innovation capability”, “tangible assets”, and “organizational process”.
3. Relationship capital dimension: “independent directors %”, “external investment”, “revenue growth rate”, “gross profit growth rate”, and “inventory turnover”.

#### *(2) Business performance*

Referring to Wu et al. [20], the evaluation of return on assets (ROA) is used for evaluating business performance; return on assets (ROA): net income/total assets.

#### *(3) Corporate value*

Referring to Chin et al. [21], Tobin’s Q evaluation is used for evaluating corporate value; Tobin’s Q: (equity market value+liability book value)/total asset book value.

### *II. Research object*

Listed companies in MICE industry in 2014~2023 QIN (Chinese enterprise financial information analysis database) are selected as the research samples, where those with incomplete data are deleted for total 102 sampled companies.

### III. *Analysis method*

Regression analysis is applied to understand the effect of intellectual capitals on business performance and corporate value.

## Analysis and discussion

### I. *Effect analysis of intellectual capitals and business performance*

Regression analysis is used in this study for testing hypotheses and the theoretical structure. The first regression analysis result, Table 1, reveals the significance of the regression equation ( $F=73.451$ ,  $p<0.001$ ), intellectual capitals show remarkable effects on business performance, where the dimensions of "human resource", "structure capital", and "relationship capital" in intellectual capitals appear notably positive effects on business performance, and the measured proxy variables achieve the significance. H1 is therefore supported.

**Table 1**  
**Regression analysis of factors in intellectual capitals to business performance**

| dependent variable→<br>independent variable↓ | business performance |        |       |
|----------------------------------------------|----------------------|--------|-------|
| intellectual capitals                        | $\beta$              | $\rho$ | VIF   |
| human resource                               |                      |        |       |
| labor force                                  | 1.738*               | 0.036  | 1.000 |
| labor quality                                | 2.045**              | 0.005  | 1.000 |
| labor experience                             | 1.896*               | 0.022  | 1.000 |
| labor cost                                   | 2.237**              | 0.000  | 1.000 |
| labor contribution                           | 2.416**              | 0.000  | 1.000 |
| structure capital                            |                      |        |       |
| innovation capability                        | 2.386**              | 0.000  | 1.000 |
| tangible assets                              | 1.641*               | 0.041  | 1.000 |
| organizational process                       | 1.763*               | 0.033  | 1.000 |
| relationship capital                         |                      |        |       |
| independent directors %                      | 2.141**              | 0.000  | 1.000 |
| external investment                          | 2.169**              | 0.000  | 1.000 |
| revenue growth rate                          | 2.094**              | 0.001  | 1.000 |
| gross profit growth rate                     | 2.253**              | 0.000  | 1.000 |

*Contd...*

|                         |          |       |       |
|-------------------------|----------|-------|-------|
| inventory turnover      | 1.947*   | 0.015 | 1.000 |
| F                       | 73.451   |       |       |
| P                       | 0.000*** |       |       |
| R <sup>2</sup>          | 0.386    |       |       |
| adjusted R <sup>2</sup> | 0.374    |       |       |

Note: \* stands for  $p < 0.05$ , \*\* for  $p < 0.01$ .

## II. Effect analysis of intellectual capitals and business performance on corporate value

Using regression analysis for testing hypotheses and the theoretical structure in this study, the first regression analysis result, Table 2, shows the significance of the regression equation ( $F=102.672$ ,  $p < 0.001$ ). Intellectual capitals appear remarkable effects on corporate value, where the dimensions of “human resource”, “structure capital”, and “relationship capital” in intellectual capitals reveal notably positive effects on corporate value, and the measured proxy variables reach the significance. Accordingly, H2 is supported.

**Table 2**  
**Regression analysis of intellectual capitals to corporate value**

| dependent variable→<br>independent variable↓ | corporate value |        |       |
|----------------------------------------------|-----------------|--------|-------|
| intellectual capitals                        | $\beta$         | $\rho$ | VIF   |
| human resource                               |                 |        |       |
| labor force                                  | 1.627*          | 0.040  | 1.647 |
| labor quality                                | 2.122**         | 0.000  | 1.563 |
| labor experience                             | 1.923*          | 0.018  | 1.646 |
| labor cost                                   | 2.127**         | 0.000  | 1.694 |
| labor contribution                           | 2.351**         | 0.000  | 1.517 |
| structure capital                            |                 |        |       |
| innovation capability                        | 2.264**         | 0.000  | 1.483 |
| tangible assets                              | 1.755*          | 0.026  | 1.396 |
| organizational process                       | 1.843*          | 0.021  | 1.516 |
| relationship capital                         |                 |        |       |
| independent directors %                      | 2.096**         | 0.001  | 1.638 |
| external investment                          | 2.108**         | 0.000  | 1.549 |

Contd...

|                          |          |       |       |
|--------------------------|----------|-------|-------|
| revenue growth rate      | 2.117**  | 0.000 | 1.622 |
| gross profit growth rate | 2.362**  | 0.000 | 1.675 |
| inventory turnover       | 2.077**  | 0.002 | 1.592 |
| F                        | 102.672  |       |       |
| P                        | 0.000*** |       |       |
| R <sup>2</sup>           | 0.438    |       |       |
| adjusted R <sup>2</sup>  | 0.425    |       |       |

Note: \* stands for  $p < 0.05$ , \*\* for  $p < 0.01$ .

## Conclusion

The research results reveal that, years of establishment, paid-in capitals, and human resource quantity present remarkable effects on business performance and market value of an enterprise in MICE industry. A company with larger size, richer experience in MICE industry, and better production efficiency of structure capitals shows better business performance and market value. Besides, an enterprise in MICE industry with longer years of establishment and strong capital would invest more resources in the establishment of relationship capital to enhance the business performance and market value in MICE industry. An enterprise in MICE industry presenting richer intellectual capitals would be superior to other competitors on business performance and market value. An enterprise in MICE industry would establish different intellectual capitals according to distinct life cycles. In the beginning stage, an enterprise in MICE industry would positively build human resource and structure capital; in the growth and mature stages, it would stress more on the backlog management of structure capital and relationship capital to build the market share. MICE industry should emphasize the interactivity and interactive effect of intellectual capitals in the management, rather than stressing on the management of building a single dimension in intellectual capitals. An organization in MICE industry could manage the combination of intellectual capitals with continuous interaction existing among manpower, structure, and relationship capital to effectively develop the complete knowledge basis. In other words, an enterprise in MICE industry intending to improve the operation performance through intellectual capitals should consider the complementarity of intellectual capitals to develop the unique intellectual capital management structure so as to effectively enhance the business performance and market value.

**Suggestion**

Aiming at intellectual capitals in MICE industry, the following suggestions are proposed in this study.

1. Human resource presents positive effects on business performance and market value in MICE industry, revealing that human resource could provide an organization in MICE industry with required flexibility to satisfy constantly changing customer needs as well as creativity required for product and service innovation to increase customer benefits. In this case, an organization in MICE industry stressing on the recruitment of talents and offering trainings on relevant professional knowledge, operating practice, integrated thinking, communication and negotiation abilities, and teamwork interpersonal relationship to reinforce human resource quality would assist in achieving the organizational goals and further promote the business performance and market value in MICE industry.
2. Structure capital notably affects business performance and market value in MICE industry, revealing that strengthening R&D innovation energy and management effectiveness could effectively enhance the business performance and market value in MICE industry. For this reason, an enterprise in MICE industry should constantly encourage the employees' continuous innovation and accumulate R&D energy. Furthermore, using structure capital to reduce repeated errors and increase the utilization of knowledge and better information processing ability could also enhance the organizational process operation, optimize operating management, reduce organizational costs, and enhance the growth of business performance and market value in MICE industry.
3. MICE industry should well apply external resources to create the maximal economic benefits. It is suggested that an enterprise in MICE industry should frequently grasp the market demand dynamics and timely provide products catering to customers to enhance the profits. On the other hand, keeping good interactive relationship with external stakeholders, frequently exchanging business information and sharing information, or applying global supply chain management (SCM) to reduce operation cost could promote logistics efficiency and enhance business performance and market value in MICE industry.

4. For an enterprise in MICE industry, intending to achieve good business performance and sustainable development, should emphasize human resource (e.g. enhancing labor quality and organizational stability), structure capital (e.g. enhancing R&D expense ratio, increasing patent and trademark approval), and relationship capital (e.g. enhancing the growth rate of major clients' revenue), as market investors would give positive responses to the investment in intellectual capitals of an enterprise in MICE industry, and the direct benefit could enhance the share price. What is more, relationship capitals should be increased in the growth and mature stages, such as striving for more major clients and the connection with external partnership. It would contribute to the value promotion in MICE industry.

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