

# Using SEM to Verify the Impacts of Intellectual Capital Accumulation and Corporate Governance upon Corporate Values: A case of Taiwan-Listed Information and Electronics Companies

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## ABSTRACT

*The purpose of this study is to verify and understand how the accumulation of Intellectual Capital (IC) and corporate governance affect the corporate value of Taiwan-listed information and electronics companies. While simple random sampling was used to yield knowledge from the population, the linear Structural Equation Modeling (SEM) was adopted to verify the goodness-of-fit among the overall model, structural model and measurement model. Findings from this study show that, firstly, IC accumulation has a positive and significant influence on the corporate value of Taiwan-listed information and electronics companies; secondly, satisfactory corporate governance has a significantly positive influence on the corporate value.*

**Keywords:** *Intellectual Capital (IC), Corporate governance, Corporate value*

## RESEARCH BACKGROUND AND PURPOSES

The high-tech industry has thrived in recent years and ushered in an era of knowledge-based economy, where most companies gain competitive advantage from intangible assets such as the Intellectual Capital (IC). Among others, a publicly traded information and electronics firm engaged in IC accumulation will see a widening positive difference between its skyrocketing market value and the initial book value. In other words, a company should enhance Enterprise Value (EV) by accumulating IC to achieve non-stop growth as well as sustainable corporate development. However, a series of financial crises has occurred in the past decade or so at Taiwan-listed information and electronics firms, in part due to the lack of regulations concerning a sound corporate governance mechanism (Cheng-en Ko, 1999). As a matter of fact, an “external corporate directors/auditors” system was already introduced at the Economic Development Advisory Conference (EDAC) back in July 2001. When the Securities and Futures Commission under the Ministry of Finance issued an executive order in February 2002 saying that “all recently listed companies, including those listed on the Over-the-Counter (OTC) market, shall hire two external directors and one external auditor”, the presence of external directors had become one of the criteria for approving recently listed companies’ entrance into the market, although it has no binding power at all on companies already publicly traded. Morris Chang, the founding father of Taiwan’s semiconductor industry and Chairman of Taiwan Semiconductor Manufacturing Co. (TSMC) has stated that, despite the aforementioned executive order, it is imperative that all sustainable development-minded companies eagerly advocate corporate governance and the external director system as well (Lin-Ju Cheng, 2008). By the time he made such remarks, corporate governance and the external director system had practically become a sweeping trend among Taiwan-based enterprises. The author of this present study, therefore, conducted research to verify and understand how IC accumulation and corporate governance

affect the operating performance of Taiwan-listed information and electronics companies, with the following research purposes:

1. To verify whether IC accumulation has a positive and significant influence on the corporate value of Taiwan-listed information and electronics companies;
2. To verify whether corporate governance has a positive and significant influence on the corporate value of Taiwan-listed information and electronics firms.

## LITERATURE REVIEW

Literature review regarding the major dimensions of this study (e.g., IC, corporate governance and corporate value) is discussed in the followed sections:

### Intellectual Capital (IC)

In 1997 Stewart published *Intellectual Capital: the New Wealth of Organizations*, a book that mentioned numerous case studies of companies in a bid to explain the three elements of IC: human capital, structural capital and customer capital. In their book entitled *Intellectual Capital: Realizing Your Company's True Value by Finding Its Hidden Brainpower*, Edvinsson & Malone (1997) explained the IC implementation process and measurement indicators adopted by Scandia Inc.

Stewart (1997) argued that IC includes human capital, structural capital and customer capital, with *human capital* being the sum of innovations, employees' mindsets, seniority, turnover rate, experiences, and status of learning; *structural capital* being the existing knowledge collected using a highly efficient method and tested, organized, integrated, with the irrelevant part sifted out for diffusion; *customer capital* being the relationships a specific organization forges with all parties it deals with, which involves customer satisfaction, customer retention rate, and customer loyalty.

Sveiby (1998) noted that IC comprises individual competence, internal/external structure, with the *individual competence* being an employee's ability to take actions under various situations, which involves explicit knowledge, skills, experiences, value-related judgments, and social network; *internal structure* being the sum of patents granted, concepts, patterns, computer and management systems; *external structure* being the relations with customers and suppliers, which involves the brand, reputation and trademark.

Johnson (1999) argued that intellect, or wisdom, is made of human capital, structural capital and relationship capital, with *human capital* being the idea capital (i.e., the human resources for knowledge-based duties and employees' gifts/attitude) combined with leadership capital (i.e., the qualities of an expert and manager); *structural capital* being the innovation capital (i.e., patents, trademarks, copyrights and knowledge database) combined with process capital (i.e., work procedures and trade secrets); *relationship capital* being the sum of relationships with customers, suppliers and network-community members.

As defined by Knight (1999), IC is made of human capital, structural capital, external capital and financial performance, with *human capital* involving the employee turnover rate, employee satisfaction, the quantity of new products/ideas, and the recommended quantity of delivery/reception; *structural capital* being the turnover rate of operating capital, the ratio of sales staff to general and administrative staff, and the launch time of a new product; *external capital* being the customer persistency, customer satisfaction, the most lucrative customer list, the indicators of suppliers' product quality/ reliability; *financial performance* being the sum of Economic Value Added (EVA), 90-day accounts receivable, and the value added by each employee.

Chen Mei-chun (2001) said not only is intangible IC an important reference indicator for evaluating the corporate values; it also consists of human capital, structural capital and relationship capital. Chen went on to define IC as “all the skills, knowledge, information, experiences, problem-solving ability and wisdom displayed by a company as a whole and incorporated into the human capital, structural capital and relationship capital”. The so-called *human capital*, according to Chen, is “the knowledge, skills and experiences of a company’s entire staff and managers”; the *structural capital* is “the overall system and procedures adopted by a company to solve problems and create values”; the *relationship capital* is the initiation, maintenance and development of an organization’s external relationships, including the relationships with customers, suppliers and business partners”.

Edvinsson (2003) gave a simple description of IC, saying it would become what supports any company in the future and also an indicator of whether a company will be operated effectively. It is impossible for a company to gain momentum for reforms unless it invests in intangible assets (Shu-hsiao Tsen and Hsiang-ling Hu, 2010). Edvinsson & Malone (1997) said IC consists of human capital, structural capital and customer capital, with the *human capital* being the sum of personal competencies, knowledge, technologies, and experiences of a company’s entire staff and managers, including the creativity and innovation capability of the organization/company. The *structural capital*, as they noted, is a supportive framework that gives human capital a physical form and power, as well as an organized capacity that includes the tangible system used to communicate or store intellectual materials. They also defined *customer capital* as the sum of customer satisfaction, durability, price sensitivity, and the long-term customers’ financial conditions.

To sum up, this present study adopted the conceptual definition of IC proposed by Chen Mei-chun (2001): “all the skills, knowledge, information, experiences, problem-solving ability and wisdom/intellect displayed by a company as a whole and incorporated into the human capital, structural capital and relationship capital”. The operational definition is briefly described below:

- A. Human capital: The knowledge, skills and experiences of a company’s entire staff and management;
- B. Structural capital: The overall system and procedures adopted by a company to solve problems and create values;
- C. Relationship capital: The initiation, maintenance and development of an organization’s external relationships, including the relationships with customers, suppliers and business partners.

### **Corporate governance**

Jensen and Meckling (1976) argued that, because of financial dependence, the major shareholders will face increased financial risks involved with the company when they hold a higher percentage of shares, and consequently become more motivated to perform management-overseeing duties.

According to Patton and Baker (1987), at a company where the chairman does not double as the president, the board of directors is able to maintain a relatively higher degree of independence and effectively monitor the management.

Qian-ju Chi (1999) said the financial crises will be more accurately predicted when the variable of CPA replacement is taken into consideration.

With the addition of variables concerning corporate auditing structure, Su-jiao Lu (2001) noted that the initial indicator-differentiation model is able to render drastically more accurate predictions. It is learned from previous literature that corporate governance is a critical variable in the financial early-warning mechanism.

In their study Lee and Yeh (2001) said that, when the percentage of pledged shares, cash-flow rights,

and the deviation of “share-controlling base” are adopted as surrogate variables to control the expropriation of minority shareholders, a rise in the percentage of shares pledged by committee members and managers will make a company more likely to face a financial crisis in the second half of the year. They also noted that corporate governance should always be factored into the financial early-warning mechanism, because a company with lackluster corporate governance could suffer a financial crisis regardless of its excellent track record.

From a legal perspective, Ai-zhi Lu (2004) said corporate governance is focused on how a corporate organization with ownership separated from operations should be effectively monitored, or controlled, through a well-designed legal system, and how the corporate organization may function as expected while avoiding illegal, corrupted business operations. From the economic point of view, some scholars argue that corporate governance is aimed at maximizing a company’s economic value, which includes the maximum rewards to shareholders, creditors, and employees. Those who take the perspective of financial management, nevertheless, believe that corporate governance is implemented to help financiers make sure the company managers use funding in the best possible way and earn rewards due them.

Based on the findings summarized from literature mentioned above, this study evaluates corporate governance-related variables such as the size of board of directors (S1), the percentage of shares held by directors/auditors (S2), the percentage of shares pledged by directors/auditors (S3), the CPA attestation reports (S4), replacement of CPA (S5), and whether or not the chairman also serves as the company’s president (S6).

### **Corporate value**

According to Yue-fang Wen (2005), the primary goal of determining the corporate value is to ensure a company achieves sustainable operations while maximizing shareholder wealth. Corporate value is one of the most important factors behind whether investors are interested in a company and willing to put money in it, and Tobin’s Q ratio is the most common measurement variable when gauging a company’s market value (Morck et al., 1988; Lin-ju Cheng, 2008).

Lindenberg & Ross (1981) considered Tobin’s Q ratio a suitable variable to measure corporate values as it takes into consideration the values of a company’s monopoly prowess, good will, copyrights, among the other intangible assets. One of the many Tobin’s Q-calculating methods previously proposed uses corporate value as the numerator and the cost of replacing tangible asserts as denominator. And yet, that calculation method is too complicated as it involves nearly 90 variables. The method is also impractical due to the unavailability of any trustworthy estimates for asset replacements of listed companies in Taiwan (Lin-ju Cheng, 2008). Therefore, this present study adopts the following Tobin’s Q calculation formula, modified and presented by Lang and Lizenberger (1989) and Chung and Pruitt (1994), as a measurement variable of corporate value:

Tobin’s Q ratio = (market value of common share + book value of preferential shares+ book value of debts) / (book value of total assets)

### **Literature concerning corporate governance and corporate value**

The following is a summary of various studies addressing topics pertaining to corporate governance and corporate value:

Hai-chin Yu and Ben-e Zhou (1994) indicated a significantly positive relation between the percentage of shares held by directors/auditors/managers and a company’s Tobin’s Q ratio. They also noted that the percentage of shares held by major shareholders is significantly and positively related to a company’s Tobin’s Q ratio.

According to Zong-hui Lin, Cheng-en Ko and Yann-ching Tsai (2004), corporate governance exerts a positive influence on a company's performance.

Klapper and Inessa (2002) believe that corporate governance affects corporate value in a positive and significant manner.

Yin-hua Wang (2006) said management shakeups help lift share prices and add to the corporate value as a result. Compared to voluntary transfers of managers, the openly announced involuntary transfers have better results, according to Wang. In Wang's study, the corporate governance mechanism was used to assess the effectiveness of openly announced management changes. A finding of that study with regard to the structure of board of directors is the unsatisfying effect of openly announced management changes at companies where the chairman doubles as president or it is a family business, both of which tend to have poor corporate governance. Such public announcements proved more effective at companies with external directors, a higher percentage of external directors, and a smaller-sized board of directors, because these types of companies perform better in terms of corporate governance, Wang said.

Morck, Shleifer & Vishny (1988) believed that major shareholders are able to enhance corporate value by effectively monitoring company managers' behaviors, prompting them to be committed to improving operating efficiency.

Yermack (1996) considered small-sized boards of directors less effective than larger ones, hence the positive relation between the size of board of directors and Tobin's Q ratio. The corporate value grows in proportion to the percentage of shares, or percentage of board-of-directors seats, held by external directors, a sign that external directors function as independent monitors or appraisers that help improve the efficiency of corporate decision-making.

Based on data of Taiwan-listed electronics firms collected from 2000 to 2003, Ai-zhi Lu (2004) explored the relation between internal/external corporate-governance ratings systems (established on the foundation of CPA attestation) and a company's financial performance. Lu's study was divided into four dimensions (i.e., the makeup of board of directors/auditors, structure of ownership, management pattern, percentage of shares pledged by directors/auditors, and excessive related-party transactions) and generated several findings: (1) Judging from the uncategorized results, there is a positive relation between internal/external corporate governance and financial performance. That is, the overall samples collected during the research period indicated that the better internal/external corporate governance mechanism is linked to a more satisfying financial performance; and (2) In a comparison of the average financial performance and regression output of companies categorized by corporate governance, no significantly positive relation was found between the financial performance and corporate governance, which is contrary to the conclusions derived from uncategorized data. Since the only consistent conclusions were yielded from the regression output of companies categorized under "unsatisfactory corporate governance either internally or externally", improving corporate governance significantly enhances the financial performance of companies with lackluster corporate governance both internally and externally, although not necessarily so when it comes to those with rather satisfying internal/external corporate governance.

Lin-ju Cheng (2008) conducted a study that said the structure of ownership and that of the board of directors both have crucial influence on corporate value. Companies with a good corporate governance system tend to attract a larger number of investors since it ensures all investors a reasonable return on their money.

We may boldly derive the following hypothesis from studies mentioned above even if they did not address Taiwan-listed information and electronics firms:

Hypothesis 1 (H<sub>1</sub>): Corporate governance has a positive and significant influence on corporate value of Taiwan-listed information and electronics companies.

## **Literature concerning IC and corporate value**

There are a considerable amount of studies regarding the dimensions of IC and corporate value; some of the frequently cited ones are described below:

Mei-chun Chen (2001) believes that IC affects the organizational performance in a significantly positive manner.

In their study, Rudez and Mihalic (2007) said it is imperative that the hotel industry enhance IC development in order to stay competitive. They also mentioned that the interaction between human capital and Information Technology (IT) has the potential of bolstering an organization's financial performance. IC significantly influences the performance of organizations in IT, bio-tech, high-tech, or emerging industries (Chang, Chen, Shaw & Lai, 2008). Among others, international tourist hotels and the other service providers offer both tangible products and intangible services that constitute organizational IC, including employees' knowledge and the organization's management procedures.

Yan-ming Chen (2008) argued in his study that IC and organizational performance are correlated in a significantly positive way.

Using the approach of case study, Tzu-ling Peng (2009) delved into the relationship between Knowledge Management (KM)-stimulating factors and KM, and further examined how an organization accumulates IC by means of KM, and how it enhances performances by accumulating IC.

According to Ching-fang Chang (2009), IC affects organizational performance in a significantly positive way. That is, a larger IC leads to improved organizational performance.

Guang-you Liu (2010) noted that human capital not only affects corporate performance directly, it also exerts an indirect influence on corporate performance through the process capital, innovation capital and customer capital.

We may boldly derive the following hypothesis from the aforementioned analyses even if it did not address Taiwan-listed information and electronics firms:

Hypothesis 2 (H2): IC accumulation has a positive and significant influence on the corporate value of Taiwan-listed information and electronics companies.

## **Research framework**

Based on the research purposes, hypotheses and literature review described above, we may obtain the research framework in Figure 1:

**Figure 1: Research Framework**

## METHODOLOGY

### Targets and the design of questionnaire

Copies of questionnaire were given to managers at Taiwan-listed information and electronics companies selected by simple random sampling. To improve the content validity and reliability, copies of expert questionnaire were given out before the pilot-test. After revising or removing inappropriate items, a post-test was conducted by giving copies of the questionnaire to managers at Taiwan-listed information and electronics companies. Out of the 300 copies given out, 140 were returned valid at a return rate of 46.7%. Table 1 shows the number of items under each variable from the major dimensions (or conceptual dimensions) and sub-dimensions (or operational measurement dimensions), along with the questionnaire structure. What is worth noting is that, to gain a clearer picture of the corporate value of Taiwan-listed information and electronics companies, this present study adopts the Tobin's Q calculation formula modified and proposed by Lang and Lizenberger (1989) and Chung and Pruitt (1994) as a measurement variable of corporate value.

### Processing of questionnaire data and measurement system

To verify the research framework proposed, this study applied linear SEM to a Confirmatory Factor Analysis (CFA) of the framework of research model. It divides the questionnaire into three implicit/latent variables (i.e., IC, corporate governance and corporate value), each containing observable/explicit variables as stated below. The survey was conducted using these observable/explicit variables, with several questionnaire items categorized under them each. After processing data collected in the survey, files were created for the primary data. Although the questionnaire design was based on Multi-Dimension Measurement, either "Double Measurement" or "Single Measurement" was adopted to make sure the computer software-aided data processing went as expected (Shun-yu Chen, 2010). Table 1 shows the number of questionnaire items under each implicit/explicit variable, along with their reference resources.

**Table 1: Total Number of Question Items and Structure of Questionnaire**

Main Dimensions	Sub-Dimensions/ Measurement Indicators	Number of Items	Reference for the Questionnaire
IC	Human capital	6	Mei-chun Chen (2001)
	Structural capital	4	
	Relationship capital	6	
Corporate governance	S1	4	Jensen and Meckling (1976) Patton and Baker (1987) Qian-ju Chi (1999) Su-jiao Lu (2001) Lee and Yeh (2001) Ai-zhi Lu(2004)
	S2	4	
	S3	4	
	S4	4	
	S5	4	
	S6	4	
Corporate value	Tobin's Q	4	Lang and Lizenberger (1989); Chung and Pruitt (1994)

### Linear structure model

The CFA is an analytical approach opposite to the Exploratory Factor Analysis (EFA). This study conducted a CFA by pairing two of three major dimensions (i.e., IC, corporate governance and corporate value). Consisting of the Structural Model and Measurement Model, the SEM provides an effective solution to the cause-effect relation between implicit/latent variables. Besides, the models verified in this

study contain three parts: (1) verifying the overall model's goodness-of-fit to make sure it conforms to the goodness-of-fit indices; (2) verifying the goodness-of-fit of Measurement Model and (3) verifying the goodness-of-fit of Structural Model.

## ANALYSES AND RESULTS

### Test results concerning fit of the overall model

We may construct a framework for the overall model after a literature review and factor analysis conducted on the collected sample data. Following the advice of Hari et al. (1998), the measurement of the fit of the overall model was divided into three aspects, namely the Measures of Absolute Fit, Incremental Fit Measures and Parsimonious Fit Measures. Table 2 shows the test results concerning fit of the overall model (Fu-chiang Chen, Hsien-kuang Fang, Guo-jia Chen and An-jan Chien, 2008).

**Table 2: Analysis of Fit of the Overall Model**

Goodness-of-fit Indices		Standards for Evaluation	Results Obtained
Measures of Absolute Fit	GFI	>0.9	0.913
	AGFI	>0.8	0.902
	RMR	<0.05	0.022
Incremental Fit Measures	NFI	>0.9	0.912
	CFI	>0.9	0.913
Parsimonious Fit Measures	PNFI	>0.5	0.742
	PGFI	>0.5	0.721

### Measurement model

The factor loading of each item under the latent/implicit variables (i.e., the major dimensions) and manifest/ explicit variables (i.e., the sub-dimensions) mainly measures the intensity of linear correlation between each item under the explicit variables and latent/implicit variables. A factor loading close to 1 indicates the measurement variable, or sub-dimension, is relatively capable of measuring the major dimensions. In this study, all sub-dimensions' factor loading exceed 0.7, hence has the satisfying reliability. All sub-dimensions (or explicit variables) in the model's measurement system are therefore capable of appropriately measuring the major dimensions (i.e., all implicit variables). Moreover, the Average Variance Extracted (AVE) is used to calculate the explanatory power of variance between implicit variables versus each measurement variable; the higher the VE value, the greater reliability and convergent validity of the implicit variables. Usually the VE value must be larger than 0.5 to indicate that the explanatory variance of dimensions is larger than measurement error (Fornell and Larcker, 1981). In this study, all AVEs were larger than 0.5, hence the latent/implicit variables' excellent reliability and convergent validity (See Table 3 and Figure 2).

**Table 3: Judgment Indicators in the Measurement Model**

Main Dimensions	Double Measurement Indices	Factor loading	Cronbach's $\alpha$	Average Variance Extracted
IC	X1	.86	.87	.67
	X2	.85	.86	.66
Corporate governance	X3	.81	.82	.61
	X4	.82	.82	.62
Corporate value	Y1	.83	.84	.72

### Coefficient of determination

Also known as Squared Multiple Correlation (SMC), the Coefficient of Determination is the degree of explanatory power of “independent variable” regarding “dependent variable” under each implicit variable. In other words, the  $R^2$  value shown in Table 4 indicates that the implicit independent variable has adequate explaining ability on the implicit dependent variable respectively.

**Table 4: Path Coefficient of Determination**

Coefficients of Determination	$R^2$
IC (X)→ Corporate value (Y)	0.78
Corporate governance (ME)→ Corporate value (Y)	0.75

### Path coefficient of implicit variables in the model

After the overall model passed an internal goodness-of-fit test, Table 5 shows the estimates of standardized path coefficient and Critical Ratio (C.R.) between latent/implicit variables. Figure 2 illustrates the results of path analysis.

**Table 5: Parameter Estimates for Implicit Variables**

	Estimate	S.E.	C.R. value	P-value
IC Corporate value	.763	.133	5.737	***
Corporate governance Corporate value	.463	.134	3.455	***

Note: \*\*\*indicates a statistically significant C.R. value ( $\alpha=0.001$ )

**Figure 2: Standardized Results of SEM Analysis**

Conclusions derived from the analysis above are:

1. As for whether there is a positive and significant influence of IC accumulation on the corporate value of Taiwan-listed information and electronics companies, we found H<sub>1</sub> supported with an estimated 0.76 standardized path coefficient (Hypothesis substantiated);
2. The satisfactory corporate governance has a positive and significant influence on corporate value of Taiwan-listed information and electronics companies, with an estimated 0.46 standardized path coefficient that supports H<sub>2</sub> (Hypothesis substantiated).

### **Conclusions and suggestions**

Based on the above-mentioned analyses and results, this chapter specifies the conclusions and contributions of this present study, followed by limitations facing the author during the research process and advice for future researches.

## **CONCLUSIONS**

In summary, this study surveyed managers at Taiwan-listed information and electronics companies and adopted SEM to verify the influence of IC and corporate governance on corporate value, using secondary data obtained from the Taiwan Economic Journal (TEJ) database. The conclusions generated from this study are specified as follows:

### **1. The influence of IC on corporate value**

The research findings show that H 1 is substantiated (i.e., IC accumulation affects the corporate value in a significantly positive manner). This matches the arguments proposed by Mei-chun Chen (2001), Rudez and Mihalic (2007), Chang, Chen & Lai (2008), Yan-ming Chen (2008), Tzu-ling Peng (2009), Ching-fang Chang (2009), and Guang-you Liu (2010), as mentioned in the literature review earlier.

### **2. The influence of corporate governance on corporate value**

The research findings show that H 2 is substantiated (i.e., satisfactory corporate governance affects the corporate value in a significantly positive manner). This matches the arguments proposed by Morck, Shleifer & Vishny (1988), Hai-chin Yu and Ben-e Zhou (1994), Yermack (1996), Klapper and Inessa (2002), Zong-hui Lin, Cheng-en Ko and Yann-ching Tsai (2004), Ai-zhi Lu (2004), Yin-hua Wang (2006) and Lin-ju Cheng (2008), as mentioned in the literature review earlier.

These two conclusions indicate a satisfying goodness-of-fit of the model established in this present study.

### **Contributions of this present study**

1. Findings from this study would encourage and inspire businesses to enhance corporate performance and EV through IC accumulation, so as to ensure their continuous growth while boosting the potential of sustainable corporate development.
2. While previous studies of satisfying corporate governance and corporate value at Taiwan-listed information and electronics companies tend to focus on EFA, this present study performed modeling on the summarized results of previous literature in related fields. It also verified the model's goodness-of-fit to find out if it has satisfying fit-of-goodness effects. Not only is this study a CFA-based one that addresses a crucial topic regarding business practices, it also is worth further research in relevant fields.
3. Since this study built and verified dimensions/indices that are crucial factors for a

company to create competitive advantages that last, it offers corporate managers/operators valuable information when making important decisions.

## LIMITATIONS

Given the limited amount of research resources, this study adopted simple random sampling and sent questionnaire copies via mail, which perhaps led to the greatest limitation facing the study: a comparatively low return rate.

### Suggestions for future researches

As a matter of fact, the study of relations among IC, corporate governance and corporate value is not only applicable to Taiwan-listed information and electronics firms. Since opinions varied in previous research over the definitions of IC and corporate governance and also over the measurement indicators for corporate value, the author of this study decided to focus solely on the managers at Taiwan-listed information and electronics companies. To ensure extensive data collection or innovations/breakthroughs, it is advised that future research studies focus on how corporate value is affected at companies of various natures, so as to determine qualities of a well-performing company and conduct cross-industry analyses/comparisons.

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