Information Contents and Mediating Effects of Intellectual Capital and Financial Capital on the Corporate Value Relevance of Business Strategy

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***Abstract*—This research aims to explore the information contents of business strategy (BS), intellectual capital (IC) and financial capital (FC) on corporate value, the mediating effects of IC and FC on the corporate value relevance of BS, and the moderating effects of quantitative easing (QE) monetary policy. This research combines the knowledge domains of strategy, IC, and finance. The Strategy-Structure-Performance framework and structural equation modeling are utilized to explore the corporate value relevancies as well as the mediating effects. The research subjects are the information technology companies listed in the Taiwan Stock Exchange, and the period covers thirteen years. Hot money flowed into the capital market because of QE, and these subjects are further split into two sub-periods to check whether the corporate value relevance differ between pre-QE and post-QE. The results show that the mediating effects of IC and FC on the corporate value relevance of BS are confirmed, and the information contents and corporate value relevancies of BS, IC, and FC are also demonstrated. The significant differences are observed in the relationship among BS, IC, FC, and corporate value between pre-QE and post-QE. The direct information content of BS on corporate value and the mediating effects of IC and FC, which differ between pre-QE and post-QE, indicate the moderating effects of the QE monetary policy on corporate value relevance, thereby supporting the managerial contingency perspectives. The managerial meanings of these results emphasize the importance of timing, and the related changes in the environment must be considered when formulating industrial policies, conducting strategic management, and performing business valuation.**

***Index Terms*—Information content, mediating effect, intellectual capital, quantitative easing.**

I. Introduction

Many corporations experienced financial distress, insolvency, or bankruptcy during the 2008 global financial crisis. In response, governments began to implement a series of quantitative easing (QE) monetary policies to ensure that they could rapidly recover from the effects of the crisis [1], [2]. However, hot money flowed into the capital market because of QE.

In the present knowledge economy, the evaluations of the capital market on corporations are no longer limited to tangible production elements and financial capital (FC). Intellectual capital (IC), which is usually classified as an "intangible asset," has been identified as a strong driver of corporation value. The strategies and instruments that corporations adopt in response to environmental fluctuations may be understood through the corporate value relevancies of business strategy (BS), IC, and FC.

This study aims to explore the information contents of BS, IC, and FC as well as the mediating effects of IC and FC on the corporate value relevance of BS between pre-QE and post-QE from the contingency perspective. Exploring the mediating effects of IC and FC on the corporate value relevance of BS as well as the moderating effects of QE can help corporations formulate appropriate decisions and maintain a stable corporate value.

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II. Literature Review

A. BS and Corporate Value

BS has an important role in the survival and competitiveness of corporations. This study applies the BS concept as a contingent factor and explores its information content on corporate value. Chandler [3] emphasized the importance of strategy in business management in his book, "Strategy and Structure," which launched a new trend in strategic management research. Porter [4] developed and applied the strategic groups concept in his overall system of strategic analysis. Porter [5] suggested that enterprises should respond effectively to all aspects of competition in the external environment and assume an offensive or defensive action to improve their competitive position. Previous studies have established a relationship between BS and corporate value. Strategic management can help organizations choose their actions, survive in the market, and improve their corporate value [6], [7]. Therefore, this study further explores the relationship between BS and corporate value.

B. IC and Corporate Value

In the present knowledge economy, the world is changing faster than before, and the evaluations of the capital market on corporations are no longer limited to tangible production elements. IC, which is commonly classified as an "intangible asset," has been identified as a strong driver of corporation value and performance. Edvinsson and Malone [8] investigated Skandia Company Ltd. and published the first public and most representative IC annual report in the world. Osborne and Cowen [9] found that high-performing

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companies published an unmistakable profile that included the distinctive characteristics of their intangible corporate cultures, people, and management systems, which separate these firms from also-rans. The information content of IC on corporate value has also been supported in many studies [10]-[12]. Therefore, this study explores the information content of IC on corporate value to develop a business valuation model that can serve as a managerial criterion of IC.

C. FC and Corporate Value

As the most tangible standard in measuring corporate value, FC represents the real value of a corporation. Ohlson [13] combined residual (excess) income valuation and linear information to create a valuation model, the Ohlson model, which employs book value (BV), excess income (XI), and "other information" as three factors to explain the share price movements. The validity of the Ohlson model has been explored and confirmed in many studies [11], [12], [14], [15]. Following this premise, this study employs the Ohlson model as its basic research model and adopts BV and XI as the "proxy variables" of FC.

In their IC annual report, Edvinsson and Malone [8] divided market value into IC and FC as well as suggested that corporate market value is equivalent to the sum of IC and FC. Accordingly, this study treats IC as a proxy variable of "other information" and combines IC with the Ohlson model to explore the information contents of IC and FC on corporate value.

D. BS, IC, FC, and Corporate Value

The aforementioned studies reveal the cross-disciplinary nature of the factors that influence corporate value, including strategy, IC, and FC. However, only few scholars have simultaneously explored the relationships among BS, IC, FC, and corporate value.

The Strategy–Structure–Performance framework has been proposed in previous studies [3], [16], [17]. Edvinsson and Malone [8] investigated the properties of IC, which were regarded similarly as equity, and found that this concept is borrowed from various stakeholders, such as customers and employees. Therefore, the essence of IC (or FC) is similar to that of the structure of a corporation.

This study employs the Strategy–Structure–Performance framework to explore the information contents of BS, IC, and FC on corporate value, the mediating effects of IC and FC on the corporate value relevance of BS, and the moderating effects of the QE monetary policy from the contingency perspective. This work combines the strategy, IC, and finance knowledge domains to help corporations formulate appropriate decisions and maintain a stable corporate value in different periods (pre-QE and post-QE).

III. Research Design

A. Research Subjects and Period

The information technology companies listed in the Taiwan Stock Exchange are used as research subjects. The Taiwanese stock market has a high proportion of foreign investments, and hot money flowed into the stock market after the implementation of QE. The period covers 13 years (from 2001 to 2013). The subjects are further split into two sub-periods to explore whether the corporate value relevancies of BS, IC, and FC differ between pre-QE and post-QE.

B. Variables Selections

To measure corporate value, this study uses share price of common stock (SPS), share price minus book value (PMB), price-to-book ratio (PBR), and Tobin's Q (TOQ), which refers to the evaluation of the capital market regarding the development potential of a corporation.

To measure the BS variables, this study uses fresh level of organization (FLO), capital expenses rate (CER), and debt ratio (DER) as proxies for entry status of a firm, strategy on investment, and strategy on financing, respectively.

To measure the IC variables, this study mainly follows Edvinsson and Malone (1997) and uses revenue growth rate (RGR), current capital turnover rate (CTR), R&D intensity (RDI), and operation profit per employee (OPE) as proxies for the four capital categories, namely, customer, process, innovation, and human, respectively. To measure the FC variables, this study mainly uses the current book value (BV) and excess income (XI) from the Ohlson model. The Definitions of Constructs and variables are summarized as shown in Table I.

TABLE I: Definitions of Constructs and Variables

Constructs	Abbreviations	Variables
Corporate Value	**SPS ($)**	share price of common stock
	PMB ($)	share price minus book value
	PBR (%)	price-to-book ratio
	TOQ (%)	Tobin's Q
Business strategy	**FLO (%)**	fresh level of organization
	CER (%)	capital expenses rate
	DER (%)	debt ratio
Intellectual capital	**RGR (%)**	revenue growth rate
	CTR (%)	current capital turnover rate
	RDI (%)	R&D intensity
	OPE ($ millions)	operation profit per employee
Financial Capital	**BV ($)**	current book value
	XI ($)	excess income

C. Hypotheses and Research Framework

This research aims to combine the knowledge domains of strategy, IC, and finance. The aforementioned studies reveal the cross-disciplinary nature of the factors that influence corporate value. The Strategy–Structure–Performance framework is used along with structural equation modeling (SEM) to explore the corporate value relevancies of BS, IC, and FC, the mediating effects of IC and FC on the corporate value relevance of BS, and the moderating effect of QE. Strategy would affect the corporate value, IC would also affect the corporate value, and FC would also affect the corporate value. Several hypotheses are therefore proposed, and Fig. 1 presents the conceptual framework.

BS plays an important role in the survival and

competitiveness of an enterprise. Previous studies have established a relationship between BS and corporate value. Strategic management can help organizations choose the appropriate actions, survive in the market, and improve their corporate value [6], [7]. Therefore, the hypothesis H1 is proposed:

H1: BS reveals a significant information content on corporate value.

In the present knowledge economy, the world is changing faster than before, and the evaluations of the capital market on corporations are no longer limited to tangible production elements. The information content of IC on corporate value has also been supported in many studies [10]-[12]. This study thus proposes the hypothesis H2:

H2: IC reveals a significant information content on corporate value.

As the most tangible standard in measuring corporate value, FC represents the real value of a corporation. This study selects its FC variables from the Ohlson [13] model. The following hypothesis H3 is proposed:

H3: FC reveals a significant information content on corporate value.

Strategy would affect the corporate value [6], [7], and IC would also affect the corporate value [10]-[12]. The Strategy-Structure-Performance framework is used to explore the mediation of IC on the corporate value relevance of BS. This study proposes the hypothesis H4:

H4: IC has a significant mediating effect between BS and corporate value.

Similarly, strategy would affect the corporate value [6], [7], and FC would also affect the corporate value [11], [12], [14], [15]. The Strategy-Structure-Performance framework is also used to explore the mediation of FC on the corporate value relevance of BS. The following hypothesis H5 is proposed:

H5: FC has a significant mediating effect between BS and corporate value.

Governments have begun to implement a series of QE to ensure a rapid recovery from the effects of the 2008 global financial crisis [1], [2]. This study explores the moderating effects of QE from the contingency perspective and proposes the following hypothesis H6:

H6: The QE has a significant moderating effect on the corporate value relevance.

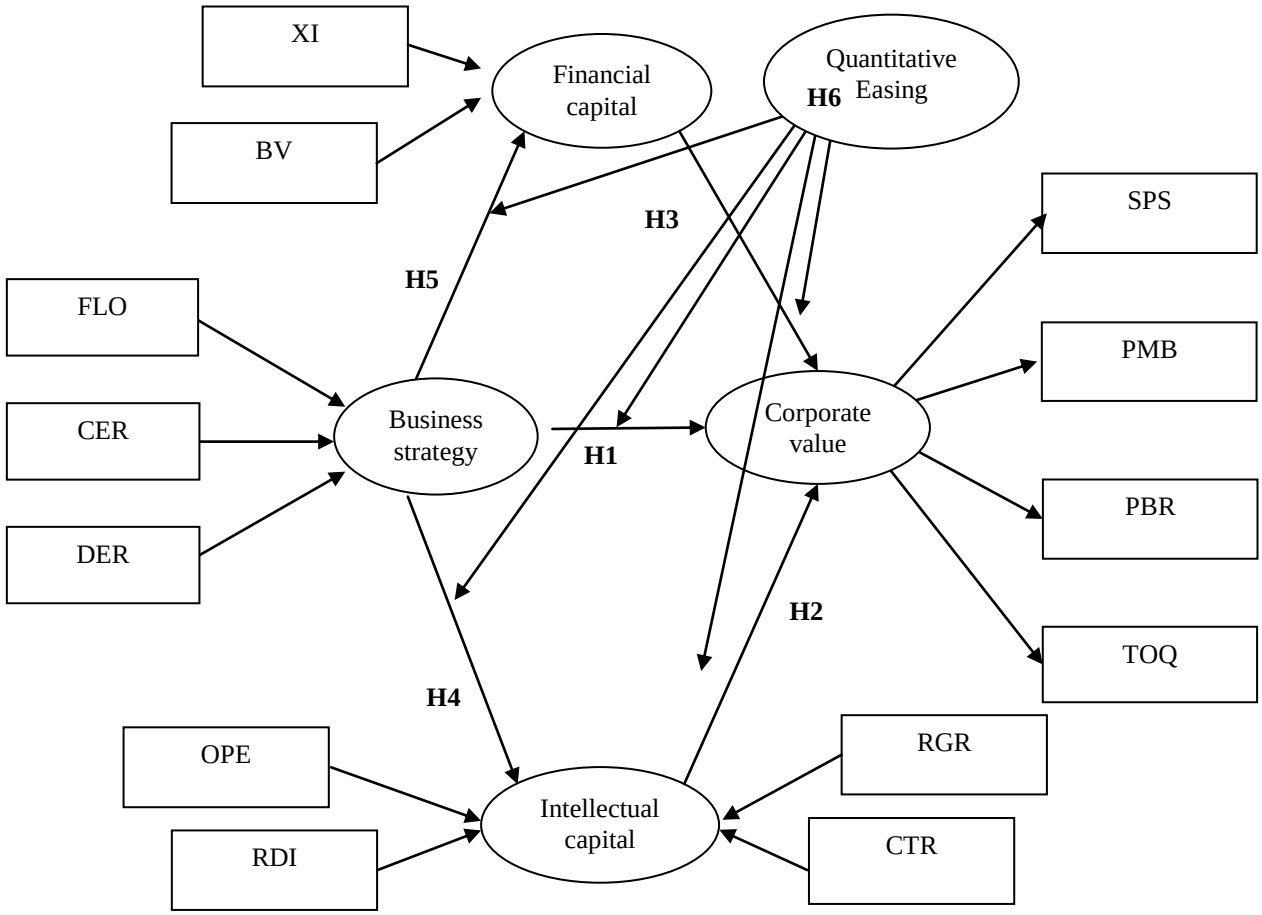

Fig. 1. Concept framework.

IV. Empirical Results

The empirical results of this study are summarized as follows (Table II):

(1) Because of QE, hot money flowed into the capital market. The results of descriptive statistics and quantitative easing analyses show that some significant differences in BS, IC, FC, and corporate value are observed between pre-QE and post-QE (Table III).

(2) The results of SEM analyses are showed as Figs. 2 and 3. The path coefficient and the determination coefficient (R^2) show the degree of fit between the model and empirical data. This research used Bootstrap to test the hypotheses, and applied T-value estimates to test the significance of path coefficients. Based on Fig. 2 and Fig. 3, BS, IC, and FC could explain 44% and 56% of the variance in corporate value. BS could explain the 9% and 2% of the variance in FC, and BS could explain the 19% and 14% of the variance in IC.

(3) Previous studies have established a relationship between BS and corporate value. The results show that BS reveals a direct significant information content on corporate value in pre-QE (Fig. 2. and Table IV) but not in post-QE (Fig. 3. and Table V), thereby partially supporting H1.

(4) In the present knowledge economy, the evaluations of the capital market on corporations are no longer limited to tangible production elements. The results show that IC reveals a significant information content on corporate value in both pre-QE and post-QE, thereby supporting H2.

(5) As the most tangible standard in measuring corporate value, FC represents the real value of a corporation. The results show that FC reveals a significant information content on corporate value in both pre-QE and post-QE, thereby supporting H3.

(6) BS reveals a significant information content on IC in both pre-QE and post-QE, and IC also reveals a significant information content on corporate value in both pre-QE and post-QE. In this case, IC has a mediating effect on the relationship between BS and corporate value in both pre-QE and post-QE, thereby supporting H4.

(7) Furthermore, BS has a significant direct information content on corporate value in pre-QE but not in post-QE. Therefore, IC has a partial mediating effect in pre-QE and a full mediating effect in post-QE.

(8) BS reveals a significant information content on FC in both pre-QE and post-QE, and FC also reveals a significant information content on corporate value in both pre-QE and post-QE. Therefore, FC has a mediating effect on the relationship between BS and corporate value in both pre-QE and post-QE, thereby supporting H5.

(9) Moreover, BS reveals a significant information content on corporate value in pre-QE but not in post-QE. Therefore, FC has a partial mediating effect in pre-QE and a full mediating effect in post-QE.

(10) According to the direct information content of BS on corporate value, and the mediating effect of IC and FC, which are different between pre-QE and post-QE, thereby supporting H6, that is, the QE has a significant moderating effect on the corporate value relevance.

V. Conclusions and Implications

The mediating effects of intellectual capital and financial capital on the corporate value relevance of business strategy have been confirmed. The information contents and corporate value relevancies of business strategy, intellectual capital, and financial capital have also been demonstrated, and the significant differences are observed in the relationship among business strategy, intellectual capital, financial capital, and corporate value between pre-QE and post-QE.

The direct information content of BS on corporate value as well as the mediating effects of IC and FC, which differ between pre-QE and post-QE, both indicate that the QE has a significant moderating effect on the corporate value relevance, and the corporate value relevancies are moderated by the QE.

These also mean that the managerial contingency perspectives are supported. The managerial meanings of these results emphasize the importance of timing, and the related changes in the environment must be considered when formulating industrial policies, conducting strategic management, and performing business valuation.

TABLE II: Results of the Hypotheses

Hypotheses	Results
H1: BS reveals a significant information content on corporate value.	Partially Support
H2: IC reveals a significant information content on corporate value.	Support
H3: FC reveals a significant information content on corporate value.	Support
H4: IC has a significant mediating effect between BS and corporate value.	Support
H5: FC has a significant mediating effect between BS and corporate value.	Support
H6: The QE has a significant moderating effect on the corporate value relevance.	Support

TABLE III: Descriptive Statistics and Quantitative Easing Analyses

Constructs	Variables	Pre-QE		Post-QE		DIF	T-val	Sig
		Ave	Std	Ave	Std			
Corporate Value	SPS	31.73	62.90	33.72	56.74	-1.99	-1.00	
	PMB	12.96	60.56	11.32	45.34	1.64	0.92	
	PBR	205.29	140.54	154.59	123.85	50.70	11.44	***
	TOQ	169.80	102.13	135.69	73.78	34.11	11.53	***
Business Strategy	FLO	6.52	3.90	5.16	2.96	1.36	11.78	***
	CER	0.53	6.23	-0.13	5.96	0.66	3.26	***
	DER	36.84	14.71	33.37	15.67	3.47	6.77	***
Intellectual Capital	RGR	17.09	34.07	4.03	47.95	13.06	9.23	***
	CTR	67.55	37.93	68.95	60.22	-1.40	-0.82	
	RDI	2.97	3.06	3.15	3.55	-0.18	-1.61	
	OPE	1.12	2.15	0.82	3.21	0.30	3.24	***
Financial Capital	BV	18.76	9.22	22.40	16.73	-3.64	-7.84	***
	XI	2.29	3.99	1.74	4.63	0.55	3.81	***

*** $p<0.01$

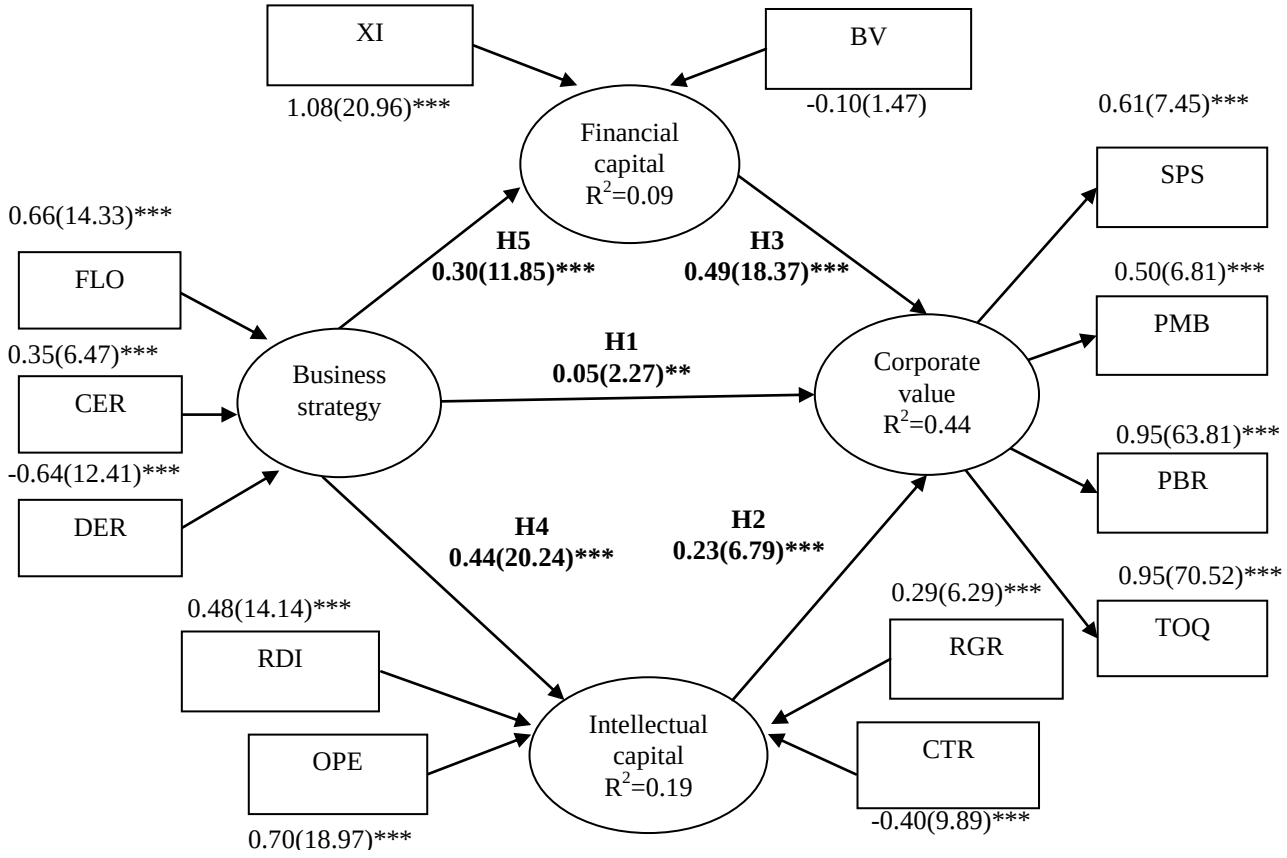

Fig. 2. The SEM analysis of pre-QE model.

TABLE IV: SEM ANALYSIS OF THE PRE-QE MODEL

Panel A: Variables, loadings, and t-values of reflective constructs

Constructs	Variables	Loadings	T-value
Corporate value	SPS	0.61	7.45***
	PMB	0.50	6.81***
	PBR	0.95	63.81***
	TOQ	0.95	70.52***

Panel B: Variables, weights, and t-values of formative constructs

Constructs	Variables	Weights	T-value
Business strategy	FLO	0.66	14.33***
	CER	0.35	6.47***
	DER	-0.64	12.41***
Intellectual capital	RGR	0.29	6.29***
	CTR	-0.40	9.89***
	RDI	0.48	14.14***
	OPE	0.70	18.97***
Financial capital	BV	-0.10	1.47
	XI	1.08	20.96***

Panel C: Reliability and validity

Constructs	Measurements	Values	Criteria	Results
Corporate value	Composite reliability	0.86	>0.6	Support
	Crobach's α	0.83	>0.6	Support
	Average variance extracted	0.62	>0.5	Support

Panel D: Determination coefficients of paths

Paths		R^2
Business strategy →	Financial capital	0.09
Financial capital → Business strategy → Intellectual capital→	Corporate value	0.44
Business strategy →	Intellectual capital	0.19

Panel E: Direct, indirect, and total effects of the latent variables

Paths	Effects		
	Direct	Indirect	Total
Business strategy → Financial capital	0.30***	-	0.30***
Financial capital → Corporate value	0.49***	-	0.49***
Business strategy → Corporate value	0.05**	0.25***	0.30***
Intellectual capital → Corporate value	0.23***	-	0.23***
Business strategy →Intellectual capital	0.44***	-	0.44***

*p<0.1；** p<0.05；*** p<0.01

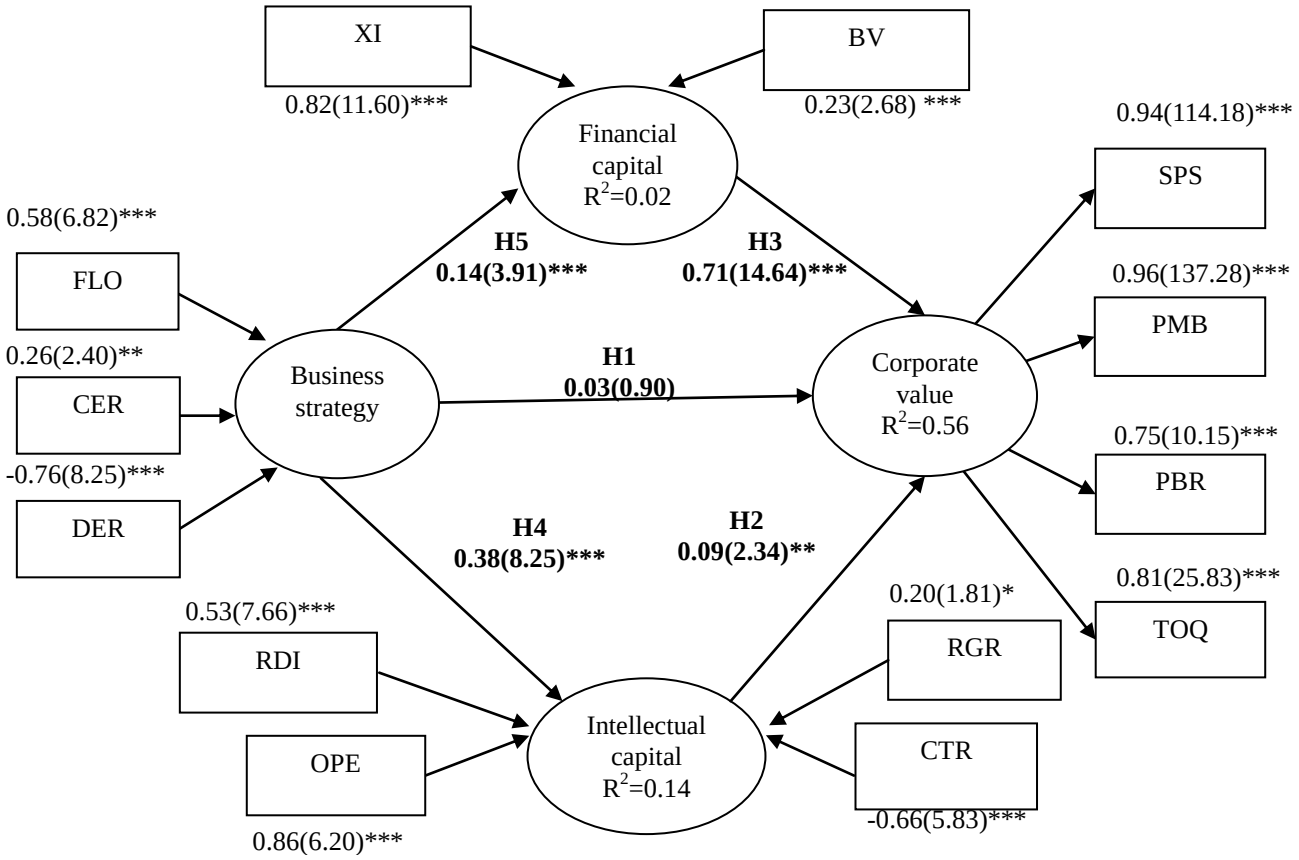

Fig. 3. The SEM analysis of post-QE model.

TABLE V: SEM ANALYSIS OF THE POST-QE MODEL

Panel A: Variables, loadings, and t-values of reflective constructs

Constructs	Variables	Loadings	T-value
Corporate value	SPS	0.94	114.18***
	PMB	0.96	137.28***
	PBR	0.75	10.15***
	TOQ	0.81	25.83***

Panel B: Variables, weights, and t-values of formative constructs

Constructs	Variables	Weights	T-value
Business strategy	FLO	0.58	6.82***
	CER	0.26	2.40**
	DER	-0.76	8.25***
Intellectual capital	RGR	0.20	1.81*
	CTR	-0.66	5.83***
	RDI	0.53	7.66***
	OPE	0.86	6.20***
Financial capital	BV	0.23	2.68 ***
	XI	0.82	11.60***

Panel C: Reliability and validity

Constructs	Measurements	Values	Criteria	Results
Corporate value	Composite reliability	0.92	>0.6	Support
	Crobach's α	0.89	>0.6	Support
	Average variance extracted	0.74	>0.5	Support

Panel D: Determination coefficients of paths

Paths		R^2
Business strategy →	Financial capital	0.02
Financial capital → Business strategy → Intellectual capital→	Corporate value	0.56
Business strategy →	Intellectual capital	0.14

Panel E: Direct, indirect, and total effects of the latent variables

Paths	Effects		
	Direct	Indirect	Total
Business strategy → Financial capital	0.14***	-	0.14***
Financial capital → Corporate value	0.71***	-	0.71***
Business strategy → Corporate value	0.03	0.13***	0.16***
Intellectual capital → Corporate value	0.09**	-	0.09**
Business strategy →Intellectual capital	0.38***	-	0.38***

*p<0.1；** p<0.05；*** p<0.01

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