

Effects of Internal Control on Dual Innovation and Business Performance Based on China's Information Technology Industry During 2016 - 2019

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ABSTRACT

Take China's information technology enterprises with innovation characteristics from 2016 to 2019 as the research samples, this paper empirically explores the relationship between internal control, dual innovation and business performance. The research concludes that internal control is positively correlated with the relative exploratory innovation level, which is conducive to the balanced development of dual innovation. Internal control can effectively promote to improve business performance. And internal control will improve business performance by promoting the balance development of dual innovation. The study provides experience basis for enterprises to internal management, and provides a reference for enterprises in the dual innovation management.

Keywords : *Internal control, dual innovation, business performance*

1. INTRODUCTION

China's economy are undergoing a transition from rapid development to high-quality development, and technological changes are gradually speeding up. However, global economic slowdown has not erased the pain caused by the preceding financial crisis for companies. With the raging spread of the novel coronavirus, it is also a major challenge to the country's economic development and enterprise development followed. Most companies in China are gradually resuming work and production, but in the long run, if companies want to continue and grow, they must strengthen their ability to respond to crises and prevent risks, and improve management quality. Internal control is an integral unit of corporate governance. It refers to the effective management and control of the daily of the enterprise based on realizing strategic goals, and fixes risk identification, prevention, and response to improve capital efficiency and reduce the risks in the operation process. It is essential for the company to achieve high-quality development. At the same time, in the process of corporate growth, innovation is undoubtedly the source of motivation for corporate growth. Exploratory innovation and exploitative innovation are two important innovation strategies in enterprises, which can help enterprises to gain a balance between the profits needed for short-term survival and the competitive advantages needed for long-term development [1]. Although both will contribute to improve business performance, with the rapid changes in the market environment, a single innovation method may not meet the diverse needs of the outside world. Companies must adopt two innovation methods at the same time. The balanced development and coordination of two innovative activities

will avoid the unsustainability of a distinct form of innovation, by it improving corporate performance. Therefore, the balanced development of exploratory innovation and exploitative innovation is a key issue related to enterprise growth [2]. However, no matters what kind of innovation strategy, there are more or fewer uncertainties. If companies want to ensure the smooth progress of innovation, they must have a reasonable risk control mechanism. Internal control is related to using capital and risk management. Now its boundary has expanded beyond accounting and auditing to the fields of business management, strategic development and other fields. As an important strategic to realize sustainable growth of enterprises, dual innovation should be affected by internal control. Therefore, internal control play a major role in enterprise innovation management and performance improvement. To better realize the purpose of internal control to improve corporate performance, it is necessary to further study the relationship between internal control and dual innovation. This article tries to start from the corporate governance perspective of internal control and empirically study the relationship between internal control on dual innovation and business performance. It is hoped to expand the internal mechanism of internal control affecting the business performance, and to provide empirical evidence for enterprises to corporate governance and innovative practices during the current novel coronavirus epidemic.

2. LITERATURE REVIEW

Domestic and foreign scholars and related studies of this article mainly focus on two aspects. One is the influence of internal control and business performance. Armstrong et

al.(2010) pointed out that if a company's internal control has major flaws, it will cause asymmetric information and conflicts among the stakeholders of the company, which is adversely affect business performance [3]. Palepu et al.(2011) confirmed that before the publication of the Sarbanes-Oxley Act, management would publicly disclose internal control information to prove its motivation to perform social responsibilities so that investors could use this information to make decisions. It is conducive to the company's investment decision, thereby bringing good development space to the company's growth [4]. The second is the influence of internal control and innovation: Domestic and overseas scholars has not reached a consensus on this research. For example, Cohen et al. (2008) proposed that corporate internal control will squeeze innovation resources [5]. But Dey et al. (2010) believe that internal control can play a role in guiding the goals of corporate innovation and help increase innovation investment [6]. We don't intend to intervene in the dispute between two different viewpoints, but from the perspective of dual innovation strategy, it believes that the essence of innovation is a strategic decision, what determines the development of an enterprise is not the number of innovation funds invested, but the form and direction of innovation funds. If the degree of the duality of internal innovation is minimal, it will also adversely affect business performance.

In summary, scholars have formed a lot of research results in this area, which also confirms the practical significance of this research. But there are still a few academic questions that have not been answered: Affected by the internal control, do the two innovation in the enterprise development in a balanced way or concentrate on it? Will it affect to improve business performance by affecting the duality of corporate innovation? Previous studies have not conducted in-depth discussions on the above issues. To answer the above questions, We attempt to use the 2016-2019 Chinese information technology companies as a research sample to conduct empirical research on the relationship between internal control, dual innovation and business performance, hoping to expand the internal mechanism of internal control affecting corporate performance. And provide empirical evidence for companies to optimize corporate governance.

3. THEORETICAL ANALYSIS AND RESEARCH HYPOTHESIS

3.1. Effects of Internal Control on Business Performance

Internal control is a part of corporate governance, which helps companies reduce risks, alleviate business difficulties, improve their managing efficiency, and help their sustainable development. Ashbaugh-Skaife et al. (2008) found that companies with higher internal control quality have higher information quality [7], a transparent information environment can strengthen stakeholders' supervision of managers, reduce managers' self-interested

behavior and opportunistic policy choices, and improve the scientific nature of decision-making, to pay more attention to employees' rights and incentives. The attention and practice of employee motivation in turn provide a guarantee for improve the company's overall performance. High-quality internal control will also improve the investment efficiency of listed companies, reduce using free cash flow in the investment, and increase cash holdings in response to managing uncertainties, which are conducive to correct judgments on internal financial decisions. Fiegenbaumc et al. (2010) pointed out that effective internal control can meet the needs of strategic change and clarify to allocate rights and responsibilities [8], and promote to improve business performance by controlling the cost of change.

Besides, internal control can identify, evaluate, respond to, and control risks in the business process, strengthen corporate risk defense capacities and response capacities, and mitigate the impact of risks on business performance. As a heterogeneous external resource of an enterprise, internal control positively affects social trust, thereby attracting more external resources and helping to improve corporate performance. High-quality internal control can ensure the authenticity of finances and set up a reliable working environment for the company. Thereby increasing the loyalty of employees and users and improving the business performance of the company. Based on this, the hypothesis proposed here is as follows:

Hypothesis 1: Internal control is positively related to business performance improvement.

3.2. Effects of Internal Control on Dual Innovation

Exploitative innovation is a high stability and can help enterprises increase short-term profits. Exploratory innovation can help companies form a strong competitive advantage and benefit their long-term development. However, companies often hesitate to move forward with exploratory innovation caused by their uncertain factors. In China enterprises generally highlight the tendency of exploitative innovation, and the two forms of innovation often appear out of balance in enterprises. Internal control is to conduct comprehensive risk management and control within the organization under the premise of ensuring to realize the development strategy goals. Effective risk assessment can identify and evaluate internal and external risk factors, weigh existing and potential risks, and timely feedback corporate information to senior management. Settle the risk tolerance consistent with innovation through risk management and control, and create distinguished response strategies for different risk factors to improve the ability to respond to innovation risks, and help companies avoid risks in the process of dual innovation to the greatest extent, especially in the face of exploratory innovation, it can effectively increase the willingness of a cautious board to carry out exploratory innovation, thereby increasing the relative proportion of exploratory innovation in the enterprise.

Effective internal control can alleviate the problem of insufficient investment in innovation caused by agency problems, and can restrain short-term behavior of agents out of inertia and job security considerations. It creates a favorable environment for exploratory innovation, which not only focuses on exploitative innovation that can bring short-term returns but also increases support for exploratory innovation activities based on the long-term development of the enterprise. In addition, through effective internal control measures such as goal setting, and organizational planning, enterprises encourage and supervise various departments, promote efficient cooperation among various departments, and increase the possibility of successful exploratory innovation, it also can convey to the outside world the signal that the company pays attention to long-term development, gaining the attention and trust of outside investors, inject more resources into the company, raising the company's confidence in developing exploratory innovation and improving the overall innovation, and promoting a more reasonable dual structure of internal innovation. Based on this, the hypothesis proposed here is as follows:

Hypothesis 2: Internal control is positively related to relatively exploratory innovation level, which is conducive to achieving a dual innovation balance.

3.3. The Mediating Role of Dual Innovation

Internal control reduces the risks in the innovation process through effective risk assessment and control. In particular, exploratory innovation, such innovative activities with more uncertain factors. Internal control can reduce financing constraints and other issues, and control innovation costs through departmental cooperation. Also, it can reduce the principal-agent problem, so that agents not only use exploitative innovation for stability, but promote scientific decision-making based on the long-term goals of the enterprise, attach importance to the exploratory innovation, and make the enterprise's innovation structure better reasonable, so as to promote the balanced development of dual innovation.

Enterprises can complete to explore new knowledge and products through exploratory innovation, forming high-level technical barriers difficult for industry competitors to overcome. Exploitative innovation is to improve existing products and services, it will help companies achieve steady growth. If an organization concentrates too much limited resources on exploratory innovation, it is easy to fall into the "innovation trap" and form a vicious circle of "exploration-failure-change without return". Similarly, excessive exploitative innovation will also cause enterprises to lock in a certain capability structure that has been formed, and it is difficult to flexibly adapt to the dynamic changes of the environment. Therefore, if a company wants to achieve sustainable business development, it must consider two different innovation activities at the same time. Ribeiro Soriano et al. (2011) found dual innovation balance is positively correlated with business performance [9]. Organizations carrying out two different innovations can not

only help the organization overcome the structural inertia brought about by over-focusing on exploitative innovation, but also avoid the loss of income caused by over-focusing on exploratory innovation [10]. Therefore, we believe that dual innovation balance may have a transmission effect between internal control and business performance. Based on this, the hypothesis proposed here is as follows:

Hypothesis 3: Balanced development of dual innovation mediates the relationship between internal control and business performance.

4. DATA AND METHOD

4.1. Sample Selection

As a resource-intensive and knowledge-intensive enterprise, information technology companies have distinct innovation characteristics. Therefore, we select Chinese information technology companies as the research sample, and the sample interval is 2016-2019. Under the premise of ensuring the data is correct, the following operations were performed on the samples, in which ST companies, financial industry companies, and companies with abnormal and missing data were excluded, and finally 300 companies and 1200 effective observation samples were obtained.

4.2. Variable Selection

Dependent variable: Business performance. Considering that China's capital market has yet to be improved and the need to improve market efficiency, financial signals are more representative of business performance than market signals such as Tobin Q. Therefore, we adopts ROA represents the business performance of the company.

Independent variable: Internal control. We adopt the internal control index of listed companies released by China Dibo Company as a substitute variable for internal control. The internal control index is based on the five major internal control . The goal (internal control strategy, operation, reporting, compliance, and asset safety) is designed to achieve the degree and is widely recognized by the industry.

Mediator variable: Dual Innovation, based on the text analysis method adopted by Uotila (2009)[1] in the measurement of dual innovation, the content analysis of the company's annual report establishes the measurement of dual innovation, the steps are as follows: First, according to the definition of dual innovation by March (1991)[11], keywords that can represent dual innovation are determined. Among them: Exploration, seeking, pursuit, change, adventure, experiment, trial, new discovery, research, change, flexibility, breakthrough, invention, and innovation represent exploratory innovation; Selection, operation, efficiency, implementation, implementation, execution, utilization, development, improvement, improvement, transformation, optimization, refinement, implementation, and implementation of representative exploitative

innovation. Secondly, using Python software to extract keywords from the 1200 annual reports of 300 companies from 2016 to 2019, and the frequency of each keyword representing dual innovation in the annual report was statistically calculated. Finally, the calculation represents the total frequency of exploratory innovation and exploitative innovation keywords appearing in the annual report, that is, the company's exploration innovation and exploitative innovation respectively. We use relative exploratory innovation to reflect the balance of dual innovation. The calculation method is: Relative exploratory innovation = the ratio of the sum of the frequency of exploratory innovation keywords to the sum of the total frequency of exploratory innovation and exploitative innovation.

Control variables: Considering the impact of other causes in the company on the company's operating performance, we select the enterprise scale, accounts receivable turnover rate, current ratio, asset-liability ratio, and business growth as the control variable for the sample study.

4.3. Model Construction

We test our hypothesis using multiple linear regression analysis with the ordinary least square (OLS) method. Besides, as a supplementary method, we use the Sobel test to verify whether the balance development of dual innovation play an intermediary role[12]. We selected software Stata.15

to complete the empirical analysis, and the details of the research model used are as follows:

$$ROA_{it} = C_0 + \alpha_0 IC_{it} + \alpha_1 Size_{it} + \alpha_2 CR_{it} + \alpha_3 Lev_{it} + \alpha_4 Arto_{it} + \alpha_5 Growth_{it} + \varepsilon_{it}$$

$$DIB_{it} = C_0 + \beta_0 IC_{it} + \beta_1 Size_{it} + \beta_2 CR_{it} + \beta_3 Lev_{it} + \beta_4 Arto_{it} + \beta_5 Growth_{it} + \varepsilon_{it}$$

$$ROA_{it} = C_0 + \gamma_0 IC_{it} + \gamma_1 DIB_{it} + \gamma_2 Size_{it} + \gamma_3 CR_{it} + \gamma_4 Lev_{it} + \gamma_5 Arto_{it} + \gamma_6 Growth_{it} + \varepsilon_{it}$$

5. EMPIRICAL RESULTS AND ANALYSIS

5.1. Descriptive Statistics and Correlation Analysis

As shown in Table 1, the internal control standard deviation is as high as 139.766, indicating that there are large differences in the level of internal control between different companies. The average value of DIB is 0.293, which represents that exploratory innovation accounts for 29.3% of the overall innovation. It also proves the reality that Chinese companies emphasize exploitative innovation and underestimate exploratory innovation.

Table 1 Descriptive statistics and Correlation analysis of variables

Variable	Mean	Std.Dev	1	2	3	4	5	6	7	8
1.ROA	2.560	9.992	-							
2.DIB	0.293	0.075	0.180 ***	-						
3.IC	621.621	139.766	0.420 ***	0.119 ***	-					
4.size	22.100	1.086	0.134 ***	0.047	0.158 ***	-				
5.CR	2.825	3.264	0.061 **	0.068 **	0.065 **	-0.308 ***	-			
6.Lev	36.738	18.421	-0.208** *	-0.071 **	-0.070 **	0.489 ***	-0.540 ***	-		
7.Atro	5.841	15.452	0.068 **	-0.033	0.067 **	0.038	0.055 *	0.061 **	-	
8.Growth	23.627	126.179	0.117 ***	-0.024	0.101 ***	0.112 ***	-0.015	0.077 ***	0.041	-

Note: *, **, *** are significant in 10%, 5%, 1% respectively

Table 2 Regression results

Variable	ROA	DIB	ROA
<i>IC</i>	0.02610***	0.00053**	0.02531***
<i>DIB</i>			15.84700***
<i>Controls variables</i>	-	-	-
<i>cons</i>	-48.59000***	0.13252**	-50.69000***
<i>F</i>	68.52***	5.38***	62.97***
<i>R²</i>	0.25630	0.02630	0.27000
<i>Adj R²</i>	0.25250	0.02140	0.26570
<i>N</i>	1200	1200	1200
<i>Sobel</i>		2.6940** p=0.007	

Note:*, **, *** are significant in 10%, 5% and 1% respectively.

In addition, in the Pearson test of related variables, it was found that IC was significantly positively correlated with ROA and DIB, which preliminarily confirmed the positive correlation between internal control and dual innovation balance and corporate performance. Through the VIF test, the maximum value of 1.89 is far less than 10, which proves the model does not have multicollinearity problems.

5.2. Regression Results and Analysis

The regression results are shown in Table 2 . In the first column, IC and ROA are positively significant at the 1% level, which means the more effective internal control, the more conducive to improving the company’s business performance. Hypothesis 1 has been verified. In the second column, IC and DIB are positively significant at the 5% level, which means that internal control of a company is beneficial to increase the relative exploratory innovation ratio of the company and can promote the balance of dual innovation. Hypothesis 2 is verified. In the third column, DIB and ROA are positively significant at the 1% level, showing that balanced development of dual innovation is conducive to improve business performance, IC and ROA are positive at 1% significant, which is 3% lower than the coefficient of IC in the first column, showing that the dual innovation balance has a partial mediation role between internal control and business performance. And through the Sobel test, it is found that the z value is 2.6940, which is significant at the 5% level, which also verifies the existence of the mediation role the dual innovation balance. Hypothesis 3 is verified.

5.3. Robustness Checks

To ensure the scientificity of the test results, we use the following two methods to test the data robustness. (1)Considering the lag effect of the independent variable’s influence on the dependent variable, the independent variable and the control variable use the data of 2016-2018, and the dependent variable uses the data of 2017-2019 to revalidate the sample. (2) Replace dependent variable. Re-verification of ROE as a substitute variable for business performance remains consistent. After the verification of the above two methods, the results are the same as the above conclusions. In view of the length of the article, the results are not listed here.

6. CONCLUSION

We use China's information technology companies as a research sample from 2016 to 2019. We found that internal control is positively related to business performance. Internal control will help increase the proportion of relative exploratory innovation and promote the balanced development of dual innovation, and the dual innovation balance has a partial mediation role between internal control and business performance. The marginal contributions of this paper are: (1) Different from previous scholars' research based on innovation input, efficiency or performance, from the perspective of dual innovation, providing a new perspective for research on the choice of innovation strategy. (2)The research introduce the concept of dual innovation balance, explore the mediation role of dual innovation balance between internal control and business performance, and expand the role of internal control affecting business performance. (3) In a practical sense, this article provides a reference for enterprises in

dual innovation management and provides an empirical basis for enterprises to optimize internal control construction and governance. Based on the conclusions, the recommendations are as follows: (1) Companies should focus on improving the quality of internal control. Enterprises should rationally design internal control according to their conditions. They should not regard the internal control process as a formal task, but to give full play to the effectiveness of internal control governance to promote business performance. (2) Pay attention to the dual innovation balance. Exploratory innovation and exploitative innovation are not a competitive relationship. Don't simply choose between the two, but pay attention to the balanced development of dual innovation within the organization to maximize the benefits of innovation. (3) Investors should pay more attention to the internal control of enterprises. Investors should pay close attention to the quality of the target company's internal control, and use it as a criterion for examining whether the target company is worthy of investment, to predict the future performance of the target company development.

ACKNOWLEDGMENT

This work was supported by National Natural Science Foundation of China (71874042).

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