

The Impact of Separation between Control Rights and Earnings Distribution Rights and the Mandatory Establishment of the Independent Director Mechanism on Investment in Intangible Assets

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Abstract

In this study, the impact of the degree of separation between control rights and earnings distribution rights on the R&D expenditures, book intangible assets and advertising expenses after the mandatory establishment of the independent director mechanism in listed/OTC companies of Taiwan was explored. Most controlling shareholders increase their shares by means of cross-shareholding or pyramid structure, and participate in the management of the corporate, which makes it difficult for minority shareholders to impact the formulation of corporate policies. Therefore, according to the agency theory, the higher the degree of separation between control rights and earnings distribution rights is, the less the intangible assets the corporate will invest. However, according to the efficient contract theory, owners of corporates may voluntarily hire professional managers and invest in the costs of self-restraint and supervision. The empirical results of this study support the efficient contract theory, that is, the degree of separation between control rights and earnings distribution rights and the number of independent directors have a positive impact on R&D expenditures, book intangible assets and advertising expenses. In addition, the number of independent directors may strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on R&D expenditures, book intangible assets and advertising expenses.

Keywords

Separation between Control Rights and Earnings Distribution Rights, Agency

1. Introduction

The value of a security lies in the rights it represents. However, the shareholding structure of Taiwan's corporates is very concentrated, and most are owned by controlling shareholders. Minority shareholders are often unable to deal directly with the corporate. Under the circumstances, they could only rely on the information about their rights provided by the issuer. However, intangible assets have the characteristics of information non-transparency, which makes it difficult to verify the effectiveness of investment decisions and easy to become a channel for controlling shareholders to seek private interests [1] [2]. In order to prevent frauds and tunneling, Taiwan has introduced regulations on independent directors (hereinafter referred to as ID) and audit committees to strengthen the independence of corporates and establish a sound corporate governance mechanism.

In the past 20 to 30 years, there have been repeated cases of fraud and tunneling of corporates in Taiwan, and these cases are often attributed to excessive concentration of shareholding structures and too high pledge ratio of substantial shareholders. This kind of improper behavior of management may cause the interests of shareholders and creditors to be damaged, and even lead to a series of crises. Experts, scholars and competent authorities find that when a corporate is not good in structure, a sudden crisis may be the last straw that breaks a camel's back. In order to remedy the deficiencies in Taiwan's corporate governance mechanism and strengthen the operation and management mechanism of the board of directors to protect the interests of shareholders, the Financial Supervisory Commission proposed in 2002 that listed/Over-the-Counter companies (hereinafter referred to as listed/OTC companies) shall establish the independent director mechanism, with the expectation that the independence and professionalism of independent directors may assist the board of directors to make beneficial and legal decisions for the corporate. This motion for the third reading has been passed in December 2005. Taking into account the size of the corporate and other factors, the competent authorities promoted the establishment of the independent director mechanism in stages. In the first stage, listed/OTC companies could establish the independent director mechanism voluntarily. In the second stage, companies of the banking industry, the securities industry and the insurance industry, financial holding companies, listed/OTC companies and non-financial companies with paid-in capital of more than NTD 50 billion were forced to establish the independent director mechanism. In the third stage, all companies of the banking industry, the securities industry and the insurance industry, financial holding companies, listed/OTC companies and non-financial OTC companies were forced to establish the independent director mechanism.

[3] mentioned that highly and continuously investing in intangible assets

could enable corporates to pass the test of external competitive environment. In order to realize the vision of universal implementation to the intellectual property management system in Taiwan, the Industrial Development Bureau, the Ministry of Economic Affairs commissioned the Institute for Information Industry in 2008 to establish and promote the Taiwan Intellectual Property Management System (TIPS), a set of software that integrates intangible assets with operation objectives, expecting to improve the investment in intangible assets and the R&D efficiency.

In order to integrate the management of intangible assets and corporate governance, the Industrial Development Bureau cooperated with the Securities and Futures Bureau, the Financial Supervisory Commission in 2014, and integrated the acquisition, application and maintenance of intangible assets into the R&D cycle of *Regulations Governing Establishment of Internal Control Systems by Public Companies*. In addition, based on TIPS, paragraph 2 of Article 37 of the *Corporate Governance Best Practice Principles for TWSE/TPEx Listed Companies* was added in 2020, in which five dimensions were proposed for corporates to evaluate the operation direction and performance of intangible assets. In this way, corporates could achieve the management of the “Plan-Do-Check-Act (PDCA) Cycle”. In the “2020 (7th) Corporate Governance Evaluation Indicators”, “whether the corporate has developed an intellectual property management plan linked to operation objectives, disclosed the implementation on the corporate’s website or annual report, and reported to the board of directors at least once a year” was added as an evaluation indicator. The revisions in the *Regulations Governing Establishment of Internal Control Systems by Public Companies*, *Corporate Governance Best Practice Principles for TWSE/TPEx Listed Companies* and the evaluation indicators of corporate governance endow the board of directors with the obligation to supervise the management and operation of intangible assets. Moreover, it is expected to control losses and enhance operational efficiency through the corporate governance mechanism, so as to improve the operational performance of corporates.

In terms of the concept of deviation between the shareholding control right¹ and the earnings distribution right² derived from controlling shareholders³, [5] took the first to analyze the shareholding structure of 27 mature countries, regarded the shareholding of more than 20% as the cut-off point to identify whether ultimate controlling shareholders exist, compared the direct shareholding with the sum of direct shareholding and indirect shareholding of shareholders, and found that the direct shareholding plus indirect shareholding (the

¹With reference to [4], controlling shareholders are defined as “The party who has the greatest and final impact on the corporate’s decisions.

²According to the method of La Porta, as adopted by TEJ, the shareholding control right is defined as the control right of shares (voting rights) calculated by the “ultimate” shareholding ratio of the chain of control, *i.e.*, the sum of the direct shareholding ratio and the indirect shareholding ratio.

³According to TEJ, the earnings distribution right, also known as the right to claim cash flow, is defined as the right to appropriate surplus of the “ultimate controller” (excluding the shareholding of managers or friendly groups).

shareholding control right) of the controlling shareholder was much higher than its direct shareholding (the earnings distribution right). Moreover, the shareholding structure of Taiwan's corporates is very concentrated, and most are owned by controlling shareholders. Therefore, it is of great significance to discuss the topic of separation between control rights and earnings distribution rights.

Good corporate governance mechanism could not only improve corporate performance, reduce operating costs of the corporate, but also build a good image of the corporate. 2021 Brand Finance Global Intangible Finance Tracker Report issued by Brand Finance⁴ shows that the value of corporates' intangible assets is increasing year by year. It has grown from USD 61 billion in 2019 to USD 74 billion in 2021. This shows that despite the impact of COVID-19, the importance of knowledge and technology for corporates cannot be underestimated. However, in past studies, the effect of researches on the separation between control rights and earnings distribution rights derived from controlling shareholders and investment in intangible assets were mainly measured based on the level of R&D investment [6], the level of patent rights [7], as well as R&D investment performance [8]. With reference to [9], it was found in this study that the greater the number of advertisements of a corporate, the higher the consumer's impression of the corporate's brand and the higher the purchase rate. [10] mentioned that investment in advertising expenses could enhance the economic value of a corporate's trademark. Moreover, when measuring intangible assets, using multiple indicators is better than using a single indicator [11]. In this study, the impact of separation between control rights and earnings distribution rights on investment in intangible assets after the mandatory establishment of the independent director mechanism in listed/OTC companies was captured from R&D expenditures, book intangible assets and advertising expenses. Taking into account that the invested R&D expenses could be capitalized upon meeting certain conditions, in this study, the sum of the R&D expenses invested in the current period and the increased developing intangible assets were used to measure the R&D expenditures invested in the current period. In addition, it also discussed whether the increase of the number of independent directors could alleviate the problems of excessive separation between control rights and earnings distribution rights, embezzlement on corporate assets and reduction of investment in intangible assets, or whether it strengthens the efficient contract theory.

Intensive and continuous investment in intangible assets enables companies to navigate the challenges posed by the external competitive environment. Controlling shareholders often increase their shareholdings by means of cross-shareholding or pyramid structure. They also participate in the management of the company. This makes it difficult for minority shareholders to have a say in the formulation of the company's policies. This study aims to explore whether the introduction of the independent director mechanism in Taiwan has reduced

⁴Brand Finance is a brand consultancy based in London, UK.

such occurrences.

2. Literature Review and Hypotheses Development

2.1. Separation between Control Rights and Earnings Distribution Rights

With the change of the shareholding structure of companies, the forms of agency problems also change. According to the object with conflict of interest, agency problems could be divided into 2 types. The first type of agency problems exists between the principal and the agent in the case of separation of ownership and management right [12]. As found by [13], when the shareholding is excessively concentrated, the decision-making of a corporate may be completely controlled by the same shareholder, and the agency problem would be transformed from that between the principal and the agent to the second type of agency problems between the controlling shareholder and the minority shareholder.

[5] found that when the shareholding is excessively concentrated, controlling shareholders often enjoy their shareholding control rights⁵ far exceeding their earnings distribution rights⁶ in the corporate by adopting the pyramid structure and complex shareholding structure. [14] and [15] found in their researches on East Asian countries that this phenomenon is more obvious in family-controlled corporates. [16] found that controlling shareholders may also serve as directors or supervisors to extend their control.

1) Agency theory

[17] found that if the controlling shareholder has separation between control rights and earnings distribution rights, the loss that the controlling shareholder needed to bear when the corporate suffered losses was much lower than the shareholding right it enjoyed, which would make it impossible for the controlling shareholder to try its best to operate and manage the corporate. [14] analyzed eight East Asian listed companies and found that when the controlling shareholders' shareholding control rights exceeded their earnings distribution rights, the corporate value would decline. [18] proposed that the reason for the decline in corporate value was that the separation between control rights and earnings distribution rights increased the agency cost of corporates. [13] mentioned that controlling shareholders may deprive minority shareholders through selling assets or securities to related parties at low prices. [19] discussed and found that when controlling shareholders' shareholding control rights exceeded their earnings distribution rights, controlling shareholders may appoint an interested person.

It has been found in many literatures that when there is separation between control rights and earnings distribution rights, controlling shareholders may make investments that are beneficial to themselves but unfavorable to the cor-

⁵According to the method of La Porta, the shareholding control right is defined as the control right of shares (voting rights) calculated by the "ultimate" shareholding ratio of the chain of control.

⁶According to TEJ, the earnings distribution right is defined as the right to appropriate surplus of the "ultimate controller".

porate because they have the right to decide corporate decisions [20]. The success of investment in intangible assets is highly uncertain, and the information of investment in intangible assets is not transparent enough. The high degree of information asymmetry makes the effectiveness of investment decisions difficult to be verified. Therefore, it is easy to become a channel for controlling shareholders to seek private interests [1] [2]. [21] pointed out that due to the accounting treatment and benefit deferral of investment in intangible assets, decision makers are likely to reduce investment in the intangible asset expenditures to improve short-term performance. [22] found that the investment performance of corporates with no separation between control rights and earnings distribution rights would be better. [8] mentioned that if decision makers of corporates invest in intangible assets for private interests, it is likely to make the investment inefficient and even lead to waste. What's more, they also pointed out that exploitation may include investing in bad programs to embezzle R&D expenditures, licensing patents to an interested person at prices below fair value, purchasing poor-quality R&D materials and equipment to make a profit from them, or appointing unqualified personnel in R&D units, which may reduce the corporate's investment performance [23].

In the era of knowledge economy, intangible assets have become a powerful tool for corporates to enhance their competitiveness and improve their business performance [24] [25]. [26] also pointed out that the benefits produced by the input of R&D expenditures could be up to 9 years. In addition, on average, R&D expenditure per NTD 1 could create a benefit of NTD 2.6 at most.

2) Efficient contract theory

Previous studies mainly explored the agency issues arising from deviations in share earnings. To prevent the drawbacks of excessive concentration of the shareholding structure, Taiwan introduced the independent director mechanism. Additionally, laws have strengthened the exercise of independent directors' powers and mandated that independent directors who do not have any stake in the company due to shareholding constraints assume the same liability for damage as non-independent directors. Independent directors can play an effective role in supervising controlling shareholders and enhancing a company's independence. Therefore, the efficient contract theory is put forward. Therefore, if a corporate wants to operate sustainably and enhance its corporate value, it must have a good corporate governance mechanism and actively invest in intangible assets. With the gradual expansion of the corporate size, the complex operation mode may result in more severe information asymmetry [27] [28]. Therefore, corporates must establish a set of efficient contracts to prevent agency problems caused by information asymmetry [13] [29]. [30] mentioned that in any corporates with high shareholding concentration, substantial shareholders could use their voting rights to effectively improve the corporate's improper strategies. Based on the "active monitoring hypothesis" proposed by them, [31] proposed that the increase of shareholding concentration may have a positive impact on the value of the corporate. Under excessive shareholding concentration, it may

cause that the controlling shareholder with separation between control rights and earnings distribution rights usually occupy multiple seats in the the board of directors [14] [16]. They could effectively control the appointment and removal of managers [4] and effectively control the decision-making of the corporate.

[32] pointed out that a sound corporate governance supervision mechanism may reduce agency problems. [33] mentioned that efficient contract could alleviate agency problems. [34] believed that when there is deviation in the original contract, corporates may make adjustments in the next year to maintain the efficient contract. On the part of managers, they may work harder to run the corporate so as to avoid the corporate from losing business opportunities, closing down, or losing their jobs [35].

On these grounds, H1 established in this study is as follows:

H1a: The increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have an impact on R&D expenditures.

H1b: The increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have an impact on the book intangible assets.

H1c: The increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have an impact on advertising expenses.

Moreover, H1-1 established based on the agency theory and H1-2 established based on the efficient contract theory are as follows:

H1a-1: According to the agency theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a negative impact on R&D expenditures.

H1a-2: According to the efficient contract theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a positive impact on R&D expenditures.

H1b-1: According to the agency theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a negative impact on the book intangible assets.

H1b-2: According to the efficient contract theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a positive impact on the book intangible assets.

H1c-1: According to the agency theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a negative impact on advertising expenses.

H1c-2: According to the efficient contract theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a positive impact on advertising expenses.

2.2. Independent Directors

The board of directors is the organization that makes decisions and executes

business, and it could be regarded as the core of a corporate [36]. According to the resource dependence theory, the board of directors also plays the role of providing resources to managers in a timely manner [37]. [38] pointed out that in order to ensure the effectiveness of the operation of the board of directors, corporates should appoint independent directors. Aiming to strengthen the corporate's system through the independence and professional stance of independent directors, the Financial Supervisory Commission added the second provision of Article 14 of the Securities and Exchange Act in 2006. Public companies are required to have at least two independent directors and no less than one-fifth of the board seats. In addition, the competent authority is authorized to update the *Regulations Governing Appointment of Independent Directors and Compliance Matters for Public Companies*, in which professional qualifications and at least five years of experience are required to serve as an independent director. Therefore, listed/OTC companies in Taiwan must establish the independent director mechanism. Moreover, all independent directors are persons with social status. Considering their reputation and avoiding being sued by minority shareholders, independent directors could exert their professional ability to enhance shareholders' rights and interests [39] [40] [41].

[42] found that the greater the number of independent directors, the better the quality of corporate governance. [43] studied the relationship between managers' compensation and corporate performance and found that the greater the number of independent directors, the more likely the reduction of managers' compensation when the corporate's performance is not good. Therefore, the establishment of the independent director mechanism could improve the rights and interests of shareholders in corporates. Coupled with the fierce competition in the external market, the importance of knowledge and technology for corporates should not be underestimated. [44] pointed out that the professional advice provided by outside directors with different backgrounds could reduce the uncertainty of decision-making of the corporate. [45] found that the higher the diversity of the board of directors is, the more beneficial it is to the formulation of corporate strategies. [46] found that the number of outside directors has a positive impact on R&D expenditures. [47] mentioned that independent directors could constantly remind managers of the importance of R&D to the corporate. [48] found that independent directors could effectively supervise the corporate's decision-making and restrain the manipulation of R&D expenditures. [49] found that the greater the number of independent directors, the higher the output of intangible assets of a corporate. [50] conducted researches on listed companies in China and found that when the specialties of independent directors are related to the business of the corporate, the corporate will have better performance in innovation. [51] found that independent directors with the qualification of lecturers in universities and colleges have a positive impact on innovation investment and innovation output. To sum up, intangible assets must be invested to achieve the sustainable development of a corporate. Independent directors could provide their professional and diversified knowledge, so that the

corporate could actively and effectively invest in intangible assets [6] [48] [52] [53] [54] [55] [56]. On these grounds, H2 established in this study is as follows:

H2a: The number of independent directors has a positive impact on R&D expenditures.

H2b: The number of independent directors has a positive impact on book intangible assets.

H2c: The number of independent directors has a positive impact on advertising expenses.

It is mentioned in most literatures that separation between control rights and earnings distribution rights may give the controlling shareholder an incentive to embezzle the rights and interests of minority shareholders. [6] pointed out that insufficient investment in R&D caused by agency problems and unnecessary expenditures in the process of R&D could be solved through a good corporate governance mechanism. [27] mentioned that the board of directors was the key to improving corporate governance. [57] and [58] pointed out that with the expansion of the corporate's operation scale, more serious agency problems would arise, so it is necessary to introduce independent directors to supervise the complex business of the corporate.

[59] mentioned that the greater the number of outside directors is, the more it could prevent managers from embezzling shareholders' wealth. [60] found that the establishment of the independent director mechanism could strengthen the corporate governance mechanism and incompetent managers could be replaced. [61] mentioned that agency problems could be effectively reduced if the proportion of independent directors in the board of directors is high. [62] pointed out that independent directors who have no interest relationship with the corporate are more likely to follow the principle of maximizing shareholders' wealth. [63] found that if independent directors have different experiences and backgrounds, the possibility of business failure and bankruptcy could be reduced. [64] mentioned that if independent directors cannot prevent or control embezzlement by shareholders, negative reports may affect their social status. Therefore, independent directors may design efficient contracts to prevent principals from tunneling the corporate's assets [65]. [56] mentioned that the introduction of independent directors into the board of directors could prevent illegal acts in a timely manner.

[66] pointed out that the greater the number of independent directors is, the more checks and balances there will be for substantial shareholders. [52] mentioned that compared with inside directors, outside directors are more objective and independent, so they could drive managers to implement R&D decisions that minority shareholders prefer. [67] pointed out that independent directors could protect corporates from the adverse effects of corruption on innovation effectiveness. [68] found that the existence of independent directors could reduce the agency cost incurred by the separation between control rights and earnings distribution rights, and the greater the number of independent directors, the more the number of granted patents. However, in the past practice, in-

dependent directors were often obstructed by controlling shareholders when fulfilling their duties [69]. In order to enable independent directors to fulfill their responsibilities in corporate governance and make independent and objective judgments on corporate affairs, the Financial Supervisory Commission has added paragraph 3 of Article 14-2 of the *Securities and Exchange Act*. Such supplemented regulations endow independent directors the right to fulfill their duties effectively and to hire experts to assist them. As a result, it will be harder for controlling shareholders to exert undue control over the corporate. After taking into account the cost of embezzlement, they may even choose to promote shareholders' rights and interests rather than embezzling minority shareholders' rights and interests.

To sum up, along with the reinforcement of the exercise of independent directors' power by laws and decrees, the limitations on shareholding ratio, and the fact that independent directors who have no interest relationship with the corporate must bear the same liability for losses as non-independent directors, independent directors could effectively play the role of supervising and controlling shareholders and enhancing the independence of the corporate [54] [70]. As a result, the corporate's decision to invest in intangible assets tends to be consistent with the interests of minority shareholders. On these grounds, H3 established in this study is as follows:

H3a-1: According to the agency theory, the number of independent directors could weaken the negative impact of the degree of separation between control rights and earnings distribution rights on R&D expenditures.

H3a-2: According to the efficient contract theory, the number of independent directors could strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on R&D expenditures.

H3b-1: According to the agency theory, the number of independent directors could weaken the negative impact of the degree of separation between control rights and earnings distribution rights on book intangible assets.

H3b-2: According to the efficient contract theory, the number of independent directors will strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on book intangible assets.

H3c-1: According to the agency theory, the number of independent directors could weaken the negative impact of the degree of separation between control rights and earnings distribution rights on advertising expenses.

H3c-2: According to the efficient contract theory, the number of independent directors could strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on advertising expenses.

3. Research Method and Design

3.1. Samples and Data Sources

Listed/OTC companies with the comprehensive mandatory establishment of the independent director mechanism since 2017 were taken as research objects in

this study. Taking into account that R&D expenditures could be capitalized upon meeting certain conditions, the increased developing intangible assets were added to measure the R&D expenditures invested in the current period. Therefore, the sample period is from 2018 to 2020, and 2017 is not included. The establishment of the independent director mechanism is implemented in stages. Companies of the financial industry, the securities industry and the insurance industry had been forced to establish the independent director mechanism in the first stage. If they are included in the research samples, it may be impossible to capture the direct effect of the comprehensive mandatory establishment of the independent director mechanism in listed/OTC companies, so they are excluded. Samples were selected from the database of Taiwan Economic Journal (TEJ). The degree of separation between control rights and earnings distribution rights and the number of independent directors were taken from the Corporate Governance Database of TEJ. Other variables were taken from TEJ IFRS Finance, IAS (International Accounting Standards) Database. The process of sample screening is shown in **Table 1**.

3.2. Definition of Variables

1) Dependent variables

a) R&D expenditures (*RD*)

With reference to [71], R&D expenditures was used to measure the impact of separation between control rights and earnings distribution rights on investment opportunities. In this study, R&D expenditures was regarded as the investment in intangible assets in the current year. Taking into account that R&D expenditures could be capitalized upon meeting certain conditions, the increased developing intangible assets were added to measure the R&D expenditures invested in the current period.

R&D expenditures (*RD*) = $\log(\text{R\&D expenses} + (\text{Stage } t - \text{Stage } t - 1) \text{ developing intangibles assets})$.

b) Book Intangible Assets (*IA*)

In this study, book intangible assets were taken as cumulative investment in intangible assets. According to [10], goodwill could only be generated when corporates merge, and it has nothing to do with whether the corporate is committed to creating corporate value, so it is excluded.

Table 1. Process of sample screening.

	2018	2019	2020	Total
Original observed value	1701	1730	1745	5176
Removed: Companies of the financial industry, the securities industry and the insurance industry	(43)	(43)	(43)	(129)
Less: Companies with incomplete variable data	(634)	(587)	(591)	(1812)
Final observed values of samples	1024	1100	1111	3235

Intangible Assets (IA) = $\log(\text{book intangible assets} - \text{goodwill} - \text{developing intangible assets})$.

c) Advertising Expenses (ADV)

[10] believes that advertising expenses could strengthen consumers' perception of a corporate's brand image, so advertising expenses are included as the agency variable for corporate brands.

Advertising expenses (ADV) = $\log(\text{book advertising expenses})$.

2) Independent variables

a) Degree of separation between control rights and earnings distribution rights (SEP)

[72] believe that it is more in line with the practice in Taiwan to measure the controlling shareholder's control over a corporate by the number of seats on the board of directors that the controlling shareholder could control. Moreover, in this study, it is believed that investment in intangible asset belongs to the authority of the board of directors. Instead of the method of tracking controlling shareholders that proposed by [5] [73], it is more appropriate to use the controlling shareholder's control over the board of directors to measure the agency problem caused by the deviation between the right of control and the right to distribute earnings. Therefore, in this study, the method of [8] was taken for reference to measure the control by the number of seats on the board of directors that the controlling shareholder could control.

Degree of separation between control rights and earnings distribution rights (SEP) = $\log(\text{control over the board of directors}^7/\text{earnings distribution right}^8)$.

b) Number of Independent Directors (ID)

With reference to [49], in this study, the number of independent directors was used to measure the impact of the independence of the board of directors on corporate innovation. Moreover, in order to effectively play the functions of directors and supervisors, listed/OTC companies have fully established the independent director mechanism in 2017, hoping to assist the board of directors to make beneficial and legal decisions for the corporate with the independence and professionalism of independent directors. Therefore, in this study, the number of independent directors was added as the agency variable for the independence of the board of directors.

Number of independent directors (ID) = $\log(\text{number of independent directors})$.

3) Control variables

a) Debt Ratio ($DEBT$)

[74] believe that the higher the debt ratio of a corporate, the higher its business risk. From the perspective of risk control, the success of investment in intangible assets is highly uncertain. If the debt ratio is high, investment in in-

⁷According to TEJ, control over the board of directors refers to the seat number of directors that the "ultimate controller" could control.

⁸According to TEJ, the earnings distribution right, also known as the right to claim cash flow, is defined as the right to appropriate surplus of the "ultimate controller" (excluding the shareholding of managers or friendly groups).

tangible assets is not appropriate. Therefore, in this study, the debt ratio was used to control the impact of corporate debt on investment in intangible assets.

Debt ratio ($DEBT$) = $\log(\text{total ending liabilities}/\text{total ending assets})$.

b) Corporate Size ($SIZE$)

With reference to the methods of [7] and [75], in this study, the number of employees was used to control the impact of corporate size on investment in intangible assets.

Corporate size ($SIZE$) = $\log(\text{number of employees})$.

c) Free Cash Flow (FCF)

[76] proposes that when a corporate has sufficient internal funds, the corporate's ability to invest in intangible assets would be better. Therefore, with reference to the method of [77], in this study, free cash flow was used to control the impact of the corporate's internal funds on investment in intangible assets.

Free cash flow (FCF) = $\log[(\text{cash flow of operating activities} - \text{cash dividends of preferred shares} - \text{cash dividends of common shares})/\text{total ending assets}]$.

d) Market Type ($MARKET$)

Due to the huge differences between listed companies and OTC companies in scale, profitability, capital and shareholding structure, a dummy variable was set up for control. If it is a listed company, its value is 1, otherwise it is 0.

3.3. Empirical Model

The purpose of this study is to explore the impact of the degree of separation between control rights and earnings distribution rights degree on investment in intangible assets after the comprehensive mandatory establishment of the independent director mechanism in listed/OTC companies. In this study, different aspects of investment in intangible assets, namely R&D expenditures, book intangible assets and advertising expenses, were discussed, respectively. In addition, whether the number of independent directors could weaken (strengthen) the negative (positive) of the degree of separation between control rights and earnings distribution rights on investment in intangible assets was also studied.

H1a-1 and H1a-2 proposed in this study mainly discuss the impact of the degree of a corporate's separation between control rights and earnings distribution rights (SEP) on R&D expenditures (RD). In order to verify the hypothesis, Model (1) was constructed as follows:

$$RD_{i,t} = \alpha_0 + \alpha_1 SEP_{i,t} + \alpha_2 DEBT_{i,t} + \alpha_3 SIZE_{i,t} + \alpha_4 FCF_{i,t} + \alpha_5 MARKET_{i,t} + \varepsilon_{i,t} \quad (1)$$

$RD_{i,t}$ = R&D expenditures of Corporate i in the t^{th} year, measured by $\log(\text{R\&D expenses} + (\text{Stage } t - \text{Stage } t - 1) \text{ developing intangibles assets})$;

$SEP_{i,t}$ = Degree of separation between control rights and earnings distribution rights of Corporate i in the t^{th} year, measured by $\log(\text{control over the board of directors/earnings distribution right})$;

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by $\log(\text{total ending liabilities}/\text{total ending assets})$;

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by

$\log(\text{number of employees})$;

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by $\log[(\text{cash flow of operating activities} - \text{cash dividends of preferred shares} - \text{cash dividends of common shares})/\text{total ending assets}]$;

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

α_0 = Intercept term;

$\alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5$ = Parameters of the regression model;

$\varepsilon_{i,t}$ = Residual term of the regression model.

H1b-1 and H1b-2 proposed in this study mainly discuss the impact of the degree of a corporate's separation between control rights and earnings distribution rights (SEP) on book intangible assets (IA). In order to verify the hypothesis, Model (2) was constructed as follows:

$$IA_{i,t} = \beta_0 + \beta_1 SEP_{i,t} + \beta_2 DEBT_{i,t} + \beta_3 SIZE_{i,t} + \beta_4 FCF_{i,t} + \beta_5 MARKET_{i,t} + \mu_{i,t} \quad (2)$$

where,

$IA_{i,t}$ = Book intangible assets of Corporate i in the t^{th} year, measured by $\log(\text{book intangible assets} - \text{goodwill} - \text{developing intangible assets})$;

$SEP_{i,t}$ = Degree of separation between control rights and earnings distribution rights of Corporate i in the t^{th} year, measured by $\log(\text{control over the board of directors/earnings distribution right})$;

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by $\log(\text{total ending liabilities}/\text{total ending assets})$;

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by $\log(\text{number of employees})$;

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by $\log[(\text{cash flow of operating activities} - \text{cash dividends of preferred shares} - \text{cash dividends of common shares})/\text{total ending assets}]$;

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

β_0 = Intercept term;

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ = Parameters of the regression model;

$\mu_{i,t}$ = Residual term of the regression model.

H1c-1 and H1c-2 proposed in this study mainly discuss the impact of the degree of a corporate's separation between control rights and earnings distribution rights (SEP) on advertising expenses (ADV). In order to verify the hypothesis, Model (3) was constructed as follows:

$$ADV_{i,t} = \lambda_0 + \lambda_1 SEP_{i,t} + \lambda_2 DEBT_{i,t} + \lambda_3 SIZE_{i,t} + \lambda_4 FCF_{i,t} + \lambda_5 MARKET_{i,t} + \nu_{i,t} \quad (3)$$

where,

$ADV_{i,t}$ = Advertising expenses of Corporate i in the t^{th} year, measured by $\log(\text{book advertising expenses})$;

$SEP_{i,t}$ = Degree of separation between control rights and earnings distribution rights of Corporate i in the t^{th} year, measured by $\log(\text{control over the board$

of directors/earnings distribution right);

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by $\log(\text{total ending liabilities}/\text{total ending assets})$;

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by $\log(\text{number of employees})$;

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by $\log[(\text{cash flow of operating activities} - \text{cash dividends of preferred shares} - \text{cash dividends of common shares})/\text{total ending assets}]$;

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

λ_0 = Intercept term;

$\lambda_1, \lambda_2, \lambda_3, \lambda_4, \lambda_5$ = Parameters of the regression model;

$v_{i,t}$ = Residual term of the regression model.

H2a proposed in this study mainly discuss the impact of the number of independent directors of the corporate (ID) on R&D expenditures (RD). In order to verify the hypothesis, Model (4) was constructed as follows:

$$RD_{i,t} = \theta_0 + \theta_1 ID_{i,t} + \theta_2 DEBT_{i,t} + \theta_3 SIZE_{i,t} + \theta_4 FCF_{i,t} + \theta_5 MARKET_{i,t} + \rho_{i,t} \quad (4)$$

$RD_{i,t}$ = R&D expenditures of Corporate i in the t^{th} year, measured by $\log(\text{R\&D expenses} + (\text{Stage } t - \text{Stage } t - 1) \text{ developing intangibles assets})$;

$ID_{i,t}$ = The number of independent directors of Corporate i in the t^{th} year, measured by $\log(\text{number of independent directors})$;

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by $\log(\text{total ending liabilities}/\text{total ending assets})$;

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by $\log(\text{number of employees})$;

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by $\log[(\text{cash flow of operating activities} - \text{cash dividends of preferred shares} - \text{cash dividends of common shares})/\text{total ending assets}]$

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

θ_0 = Intercept term;

$\theta_1, \theta_2, \theta_3, \theta_4, \theta_5$ = Parameters of the regression model;

$\rho_{i,t}$ = Residual term of the regression model.

Where,

H2b proposed in this study mainly discuss the impact of the number of independent directors (ID) on book intangible assets (IA). In order to verify the hypothesis, Model (5) was constructed as follows:

$$IA_{i,t} = \gamma_0 + \gamma_1 ID_{i,t} + \gamma_2 DEBT_{i,t} + \gamma_3 SIZE_{i,t} + \gamma_4 FCF_{i,t} + \gamma_5 MARKET_{i,t} + \omega_{i,t} \quad (5)$$

where,

$IA_{i,t}$ = Book intangible assets of Corporate i in the t^{th} year, measured by $\log(\text{book intangible assets} - \text{goodwill} - \text{developing intangible assets})$;

$ID_{i,t}$ = The number of independent directors of Corporate i in the t^{th} year,

measured by log(number of independent directors);

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by log(total ending liabilities/total ending assets);

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by log(number of employees);

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by log[(cash flow of operating activities – cash dividends of preferred shares – cash dividends of common shares)/total ending assets];

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

γ_0 = Intercept term;

$\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5$ = Parameters of the regression model;

$\omega_{i,t}$ = Residual term of the regression model.

H2c proposed in this study mainly discuss the impact of the number of independent directors of the corporate (ID) on advertising expenses (ADV). In order to verify the hypothesis, Model (6) was constructed as follows:

$$ADV_{i,t} = \zeta_0 + \zeta_1 ID_{i,t} + \zeta_2 DEBT_{i,t} + \zeta_3 SIZE_{i,t} + \zeta_4 FCF_{i,t} + \zeta_5 MARKET_{i,t} + i_{i,t} \quad (6)$$

where,

$ADV_{i,t}$ = Advertising expenses of Corporate i in the t^{th} year, measured by log(book advertising expenses);

$ID_{i,t}$ = The number of independent directors of Corporate i in the t^{th} year, measured by log(number of independent directors);

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by log(total ending liabilities/total ending assets);

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by log(number of employees);

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by log[(cash flow of operating activities – cash dividends of preferred shares – cash dividends of common shares)/total ending assets];

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

ζ_0 = Intercept term;

$\zeta_1, \zeta_2, \zeta_3, \zeta_4, \zeta_5$ = Parameters of the regression model;

$i_{i,t}$ = Residual term of the regression model.

H3a-1 and H3a-2 proposed in this study mainly discuss the impact of the degree of a corporate's separation between control rights and earnings distribution rights (SEP) and the number of independent directors (ID) on R&D expenditures (RD). In order to verify the hypothesis, Model (7) was constructed as follows:

$$RD_{i,t} = \Omega_0 + \Omega_1 SEP_{i,t} + \Omega_2 ID_{i,t} + \Omega_3 SEP_{i,t} \times ID_{i,t} + \Omega_4 DEBT_{i,t} + \Omega_5 SIZE_{i,t} + \Omega_6 FCF_{i,t} + \Omega_7 MARKET_{i,t} + \zeta_{i,t} \quad (7)$$

$RD_{i,t}$ = R&D expenditures of Corporate i in the t^{th} year, measured by

$\log(\text{R\&D expenses} + (\text{Stage } t - \text{Stage } t - 1) \text{ developing intangibles assets});$

$SEP_{i,t}$ = Degree of separation between control rights and earnings distribution rights of Corporate i in the t^{th} year, measured by $\log(\text{control over the board of directors/earnings distribution right});$

$ID_{i,t}$ = The number of independent directors of Corporate i in the t^{th} year, measured by $\log(\text{number of independent directors});$

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by $\log(\text{total ending liabilities/total ending assets});$

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by $\log(\text{number of employees});$

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by $\log[(\text{cash flow of operating activities} - \text{cash dividends of preferred shares} - \text{cash dividends of common shares})/\text{total ending assets}];$

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

Ω_0 = Intercept term;

$\Omega_1, \Omega_2, \Omega_3, \dots, \Omega_7$ = Parameters of the regression model;

$\varsigma_{i,t}$ = Residual term of the regression model.

where,

H3b-1 and H3b-2 proposed in this study mainly discuss the impact of the degree of a corporate's separation between control rights and earnings distribution rights (SEP) and the number of independent directors (ID) on book intangible assets (IA). In order to verify the hypothesis, Model (8) was constructed as follows:

$$IA_{i,t} = \delta_0 + \delta_1 SEP_{i,t} + \delta_2 ID_{i,t} + \delta_3 SEP_{i,t} \times ID_{i,t} + \delta_4 DEBT_{i,t} + \delta_5 SIZE_{i,t} + \delta_6 FCF_{i,t} + \delta_7 MARKET_{i,t} + \sigma_{i,t} \quad (8)$$

where,

$IA_{i,t}$ = Book intangible assets of Corporate i in the t^{th} year, measured by $\log(\text{book intangible assets} - \text{goodwill} - \text{developing intangible assets});$

$SEP_{i,t}$ = Degree of separation between control rights and earnings distribution rights of Corporate i in the t^{th} year, measured by $\log(\text{control over the board of directors/earnings distribution right});$

$ID_{i,t}$ = The number of independent directors of Corporate i in the t^{th} year, measured by $\log(\text{number of independent directors});$

$DEBT_{i,t}$ = Debt ratio of Corporate i in the t^{th} year, measured by $\log(\text{total ending liabilities/total ending assets});$

$SIZE_{i,t}$ = Corporate size of Corporate i in the t^{th} year, measured by $\log(\text{number of employees});$

$FCF_{i,t}$ = Free cash flow of Corporate i in the t^{th} year, measured by $\log[(\text{cash flow of operating activities} - \text{cash dividends of preferred shares} - \text{cash dividends of common shares})/\text{total ending assets}];$

$MARKET_{i,t}$ = If Corporate i is a listed company, the value is 1, otherwise it is 0;

δ_0 = Intercept term;

$\delta_1, \delta_2, \delta_3, \dots, \delta_7$ = Parameters of the regression model;

$\sigma_{i,t}$ = Residual term of the regression model.

H3c-1 and H3c-2 proposed in this study mainly discuss the impact of the degree of a corporate's separation between control rights and earnings distribution rights (*SEP*) and the number of independent directors (*ID*) on advertising expenses (*ADV*). In order to verify the hypothesis, Model (9) was constructed as follows:

$$ADV_{i,t} = \xi_0 + \xi_1 SEP_{i,t} + \xi_2 ID_{i,t} + \xi_3 SEP_{i,t} \times ID_{i,t} + \xi_4 DEBT_{i,t} + \xi_5 SIZE_{i,t} + \xi_6 FCF_{i,t} + \xi_7 MARKET_{i,t} + v_{i,t} \quad (9)$$

where,

$ADV_{i,t}$ = Advertising expenses of Corporate *i* in the t^{th} year, measured by log(book advertising expenses);

$SEP_{i,t}$ = Degree of separation between control rights and earnings distribution rights of Corporate *i* in the t^{th} year, measured by log(control over the board of directors/earnings distribution right);

$ID_{i,t}$ = The number of independent directors of Corporate *i* in the t^{th} year, measured by log(number of independent directors);

$DEBT_{i,t}$ = Debt ratio of Corporate *i* in the t^{th} year, measured by log(total ending liabilities/total ending assets);

$SIZE_{i,t}$ = Corporate size of Corporate *i* in the t^{th} year, measured by log(number of employees);

$FCF_{i,t}$ = Free cash flow of Corporate *i* in the t^{th} year, measured by log[(cash flow of operating activities – cash dividends of preferred shares – cash dividends of common shares)/total ending assets];

$MARKET_{i,t}$ = If Corporate *i* is a listed company, the value is 1, otherwise it is 0;

ξ_0 = Intercept term;

$\xi_1, \xi_2, \xi_3, \dots, \xi_7$ = Parameters of the regression model;

$v_{i,t}$ = Residual term of the regression model.

The definitions of variables are listed as following **Table 2**.

4. Empirical Results and Analysis

4.1. Descriptive Statistics

Table 3 is a descriptive statistical table of variables after the mandatory establishment of the independent director mechanism in listed/OTC companies. In order to show the original patterns of all samples, the values of all variables in the descriptive statistical table are values before taking the natural logarithm. In terms of dependent variables, it could be seen from the table that the average annual R&D expenditures (*RD*) invested by a corporate is NTD 638,153.48, the median is NTD 68,171.00, the maximum is NTD 109,000,000.00, the minimum is NTD 0.00, and the standard deviation is NTD 4,560,000.00. The average is

Table 2. Summary table of definition and measurements of variables.

Variable name		Expected direction	Definition and measurement
Dependent variable			
R&D expenditures	<i>RD</i>		log(R&D expenses + (Stage t – Stage $t - 1$) developing intangibles assets)
Book Intangible Assets	<i>IA</i>		log(book intangible assets – goodwill – developing intangible assets).
Advertising Expenses	<i>ADV</i>		log(book advertising expenses).
Independent variable			
Degree of separation between control rights and earnings distribution rights	<i>SEP</i>	Positive/negative	log(control over the board of directors /earnings distribution right).
Number of independent directors	<i>ID</i>	Positive	log(number of independent directors).
Control variable			
Debt ratio	<i>DEBT</i>	Negative	log(total ending liabilities/total ending assets).
Corporate size	<i>SIZE</i>	Positive	log(number of employees).
Free cash flow	<i>FCF</i>	Positive	log[(cash flow of operating activities – cash dividends of preferred shares – cash dividends of common shares)/total ending assets].
Market type	<i>MARKET</i>	Positive	If the corporate is a listed company, the value is 1, otherwise it is 0.

Table 3. Descriptive statistical scale.

Variable name	Average Mean	Median	Minimum	Maximum	Standard Deviation
<i>RD</i>	638,153.48	68,171.00	0.00	109,000,000.00	4,560,000.00
<i>IA</i>	424,157.09	7,343.00	0.00	90,000,000.00	3,880,000.00
<i>ADV</i>	878,418.75	148,000.00	0.00	102,000,000.00	4,280,000.00
<i>SEP</i>	26.20	24.12	0.01	89.95	15.86
<i>ID</i>	2.75	3.00	1.00	6.00	0.57
<i>DEBT</i> (%)	40.94	41.34	1.63	97.52	17.31
<i>SIZE</i>	3464.48	623.00	9.00	878,000.00	24,994.37
<i>FCF</i> (%)	0.13	0.11	0.00	0.96	0.10
<i>MARKET</i>	0.57	1.00	0.00	1.00	0.49

Note: 1. *RD*: R&D expenditures; *IA*: Book intangible assets; *ADV*: Advertising expenses; *SEP*: Degree of separation between control rights and earnings distribution rights; *ID*: Number of independent directors; *DEBT*: Debt ratio; *SIZE*: Corporate size; *FCF*: Free cash flow; *MARKET*: Market type. 2. The number of samples is 3235. 3. The unit of *RD*, *IA* and *ADV* is NTD. The unit of *ID* and *SIZE* is person. The unit of *DEBT* and *FCF* is %. 4. In order to show the original patterns of all samples, the values of all variables in the descriptive statistical table are values before taking the natural logarithm.

greater than the median. The right-skewed distribution shows that some listed/OTC companies were more actively investing in R&D expenditures. Moreover, the maximum is NTD 109,000,000.00 and the minimum is NTD 0.00. It means

that there are huge differences in the investment in R&D expenditures by listed/OTC companies. The average annual book intangible assets (*IA*) invested by a corporate is NTD 424,157.09, the median is NTD 7343.00, the maximum is NTD 90,000,000.00, the minimum is NTD 0.00, and the standard deviation is NTD 3,880,000.00. The average is greater than the median. The right-skewed distribution shows that some listed/OTC companies have accumulated more intangible assets. Moreover, the maximum is NTD 90,000,000.00 and the minimum is NTD 0.00. It means that there are listed/OTC companies with book intangible assets of up to NTD 90 million, and there are also companies with no listed book intangible assets, and the difference is very huge. The average annual advertising expense (*ADV*) invested by a corporate is NTD 878,418.75, the median is NTD 148,000.00, the maximum is NTD 102,000,000.00, the minimum is NTD 0.00, and the standard deviation is NTD 4,280,000.00. The average is greater than the median. The right-skewed distribution shows that some listed/OTC companies are more committed to investing in advertising expenses to improve the brand image of them. Moreover, the maximum is NTD 102,000,000.00 and the minimum is NTD 0.00. It means that there are listed/OTC companies with heavy investment in advertising expenses and companies without any investment in advertising expenses. It shows that listed/OTC companies have huge differences in advertising expenses.

In terms of independent variables, the average degree of separation between control rights and earnings distribution rights (*SEP*) is 26.20, the median is 24.12, the maximum is 89.95, the minimum is 0.01, and the standard deviation is 15.86. It shows that most listed/OTC companies have separation between control rights and earnings distribution rights and the values of them are not low. The average number of independent directors (*ID*) is 2.75, the median is 3.00, the maximum is 6.00, the minimum is 1.00, and the standard deviation is 0.57. It means that the number of independent directors in listed/OTC companies is 2-3 on average, and there is no huge difference.

In terms of control variables, the average debt ratio (*DEBT*) is 40.94%, the median is 41.34%, the maximum is 97.52%, the minimum is 1.63%, and the standard deviation is 17.31%. It shows that the average debt ratio of listed/OTC companies is about 40.94%. The average corporate size (*SIZE*) is 3464.48 person, the median is 623.00 person, the maximum is 878,000.00 person, the minimum is 9.00 person, and the standard deviation is 24,994.37 person. The average free cash flow (*FCF*) is 0.13%, the median is 0.11%, the maximum is 0.96%, the minimum is 0.00%, and the standard deviation is 0.10%. The average value of market type (*MARKET*) is 0.57, the median is 1.00, the maximum is 1.00, the minimum is 0.00, and the standard deviation is 0.49. It means that the number of listed companies is greater than that of OTC companies.

4.2. Analysis of Regression Results

Table 4 shows the regression results of the impact of the degree of separation between control rights and earnings distribution rights (*SEP*) and the number of

Table 4. Analysis of regression results.

Variable name	Dependent variable								
	<i>RD</i> Model (1)	<i>IA</i> Model (2)	<i>ADV</i> Model (3)	<i>RD</i> Model (4)	<i>IA</i> Model (5)	<i>ADV</i> Model (6)	<i>RD</i> Model (7)	<i>IA</i> Model (8)	<i>ADV</i> Model (9)
CONSTANT	7.479*** (33.301)	3.910*** (11.410)	6.614*** (39.023)	7.152*** (30.290)	3.199*** (8.791)	6.475*** (36.434)	7.489*** (16.627)	3.626*** (5.525)	6.714*** (20.284)
<i>SEP</i>	0.228*** (7.664)	0.229*** (5.332)	0.088*** (4.006)				-0.068 (-0.544)	-0.103 (-0.564)	-0.066 (-0.715)
<i>ID</i>				1.034*** (8.606)	1.404*** (7.724)	0.435*** (4.698)	0.097 (0.244)	0.381 (0.659)	-0.049 (-0.165)
<i>SEP</i> × <i>ID</i>							0.298*** (2.355)	0.327** (1.771)	0.158** (1.663)
<i>DEBT</i>	-0.074 (-1.327)	0.095 (1.136)	0.485*** (11.849)	-0.080 (-1.436)	0.099 (1.193)	0.478*** (11.715)	-0.061 (-1.110)	0.121 (1.466)	0.489*** (11.979)
<i>SIZE</i>	0.632*** (30.711)	0.750*** (24.785)	0.594*** (39.168)	0.627*** (30.461)	0.737*** (24.435)	0.591*** (38.858)	0.603*** (29.270)	0.714*** (23.516)	0.580*** (37.697)
<i>FCF</i>	0.190*** (7.110)	0.101** (2.500)	0.107*** (5.395)	0.178*** (6.687)	0.085** (2.113)	0.103*** (5.160)	0.183*** (6.929)	0.090** (2.244)	0.104*** (5.252)
<i>MARKET</i>	0.186*** (3.201)	0.303*** (3.461)	0.390*** (8.846)	0.153*** (2.627)	0.245*** (2.795)	0.378*** (8.546)	0.143** (2.477)	0.230*** (2.637)	0.371*** (8.405)
Adj. R ²	0.386	0.300	0.517	0.389	0.308	0.518	0.402	0.314	0.520
F-statistic	342.150***	230.050***	678.594***	347.043***	238.889***	681.080***	261.810***	176.218***	491.347***

Note: 1. *RD*: R&D expenditures; *IA*: Book intangible assets; *ADV*: Advertising expenses; *SEP*: Degree of separation between control rights and earnings distribution rights; *ID*: Number of independent directors; *DEBT*: Debt ratio; *SIZE*: Corporate size; *FCF*: Free cash flow; *MARKET*: Market type. 2. The numbers in () are within R-squared t values. Within R-squared is the R-squared under fixed effects. 3. ***p < 0.01, **p < 0.05, *p < 0.1.

independent directors (*ID*) on R&D expenditures (*RD*), book intangible assets (*IA*) and advertising expenses (*ADV*) that have been discussed in this study. Model (1) - Model (9) listed in this table are the results of regression models of 9 different hypotheses in this study, respectively.

The results of Model 1 in **Table 4** show that the degree of separation between control rights and earnings distribution rights (*SEP*) has a significant positive impact on R&D expenditures (*RD*). With a coefficient of 0.228 and a P value less than 0.01, H1a-2 is favored. In other words, according to the efficient contract theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a positive impact on R&D expenditures.

The results of Model 2 show that the degree of separation between control rights and earnings distribution rights (*SEP*) has a significant positive impact on

book intangible assets (*IA*). With a coefficient of 0.229 and a P value less than 0.01, H1b-2 is favored. In other words, according to the efficient contract theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a positive impact on book intangible assets.

The results of Model 3 show that the degree of separation between control rights and earnings distribution rights (*SEP*) has a significant positive impact on advertising expenses (*ADV*). With a coefficient of 0.088 and a P value less than 0.01, H1c-2 is favored. In other words, according to the efficient contract theory, the increase of the degree of the controlling shareholder' separation between control rights and earnings distribution rights will have a positive impact on advertising expenses.

The results of Model 4 show that the number of independent directors (*ID*) has a significant positive impact on R&D expenditures (*RD*). With a coefficient of 1.034 and a P value less than 0.01, H2a is favored. In other words, the number of independent directors will have a positive impact on R&D expenditures.

The results of Model 5 show that the number of independent directors (*ID*) has a significant positive impact on book intangible assets (*IA*). With a coefficient of 1.404 and a P value less than 0.01, H2b is favored. In other words, the number of independent directors will have a positive impact on book intangible assets.

The results of Model 6 show that the number of independent directors (*ID*) has a significant positive impact on advertising expenses (*ADV*). With a coefficient of 0.435 and a P value less than 0.01, H2c is favored. In other words, the number of independent directors will have a positive impact on advertising expenses.

The results of Model 7 show that the product ($SEP \times ID$) of the degree of separation between control rights and earnings distribution rights (*SEP*) and the number of independent directors (*ID*) has a significant positive impact on R&D expenditures (*RD*). With a coefficient of 0.298 and a P value less than 0.01, H3a-2 is favored. In other words, according to the efficient contract theory, the number of independent directors will strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on R&D expenditures.

The results of Model 8 show that the product ($SEP \times ID$) of the degree of separation between control rights and earnings distribution rights (*SEP*) and the number of independent directors (*ID*) has a significant positive impact on book intangible assets (*IA*). With a coefficient of 0.327 and a P value less than 0.05, H3b-2 proposed in this study is favored. In other words, according to the efficient contract theory, the number of independent directors will strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on book intangible assets.

The results of Model 9 show that the product ($SEP \times ID$) of the degree of separation between control rights and earnings distribution rights (*SEP*) and the

number of independent directors (*ID*) has a significant positive impact on advertising expenses (*ADV*). With a coefficient of 0.158 and a P value less than 0.05, H3c-2 is favored. In other words, according to the efficient contract theory, the number of independent directors will strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on advertising expenses.

In control variables, the direction of the debt ratio (*DEBT*) is opposite to the expected direction. The reason may be that corporates attach importance to the investment of intangible assets, and they may increase debts while growing. Therefore, the debt ratio (*DEBT*) is positively correlated with R&D expenditures (*RD*), book intangible assets (*IA*) and advertising expenses (*ADV*). In addition, corporate size (*SIZE*), free cash flow (*FCF*) and market type (*MARKET*) are all positively correlated with R&D expenditures (*RD*), book intangible assets (*IA*) and advertising expenses (*ADV*), same as the expected direction.

5. Conclusions and Suggestions

The shareholding structure of Taiwan's corporates is relatively concentrated. Controlling shareholders may increase their shares by means of cross-shareholding or pyramid structure, and participate in the management of the corporate. A series of issues arise from deviation between the shareholding control right (direct shareholding + indirect shareholding) and the earnings distribution right (direct shareholding). The purpose of this study is to explore the impact of the degree of separation between control rights and earnings distribution rights of the controlling shareholders of listed/OTC companies on the investment in intangible assets after the comprehensive mandatory establishment of the independent director mechanism in 2017. Before the comprehensive establishment of the independent director mechanism, most studies started from the perspective of agency problems, and proposed that controlling shareholders would erode the rights of minority shareholders and creditors and embezzle the assets of the corporate. In this study, the data after the comprehensive mandatory establishment of the independent director mechanism in listed/OTC companies was taken as samples. The empirical results support the efficient contract theory, and prove that the development of intangible assets is a powerful tool for corporates to enhance competitiveness and improve business performance [24] [25]. When the degree of separation between control rights and earnings distribution rights increases, owners may voluntarily hire professional managers and invest in self-restraint and self-supervision costs, and invest more R&D expenditures, book intangible assets and advertising expenses. Because of the independence and diversity of independent directors, the number of independent directors will have a positive impact on R&D expenditures, book intangible assets and advertising expenses. Moreover, the number of independent directors will strengthen the positive impact of the degree of separation between control rights and earnings distribution rights on R&D expenditures, book intangible assets and advertising expenses.

The limitation of this study is that it researched on listed/OTC companies after the comprehensive mandatory establishment of the independent director mechanism since 2017. However, the establishment of the independent director mechanism was implemented in stages. In addition, some listed/OTC companies that do not meet the paid-in capital requirements for the comprehensive mandatory establishment of the independent director mechanism may have established the independent director mechanism in advance.

Suggestions for the academic community and future research include: First, the research sample in this study is a full sample. It is suggested that further research could be carried out for different industries in the future, especially in the highly competitive electronics industry, where independent directors with professional knowledge and investment in intangible assets could create huge economic benefits. Second, in the future, more in-depth studies could be conducted on the adjustment effect of the impact of separation between control rights and earnings distribution rights on investment in intangible assets before the establishment of the independent director mechanism, after the voluntary establishment of the independent director mechanism and after the mandatory establishment of the independent director mechanism. In terms of government policies, it is recommended that competent authorities could directly establish relevant regulations on separation between control rights and earnings distribution rights. In terms of practice and management implications, if minority shareholders want to prevent controlling shareholders from embezzling their assets in the corporates by means of separation between control rights and earnings distribution rights, they could prevent these frauds by employing more independent directors.

Concerning the contributions of this study, first, no regulations have been formulated with regard to the degree of deviation in share earnings. The findings of this study may serve as a reference for competent authorities in formulating relevant regulations. Second, this study presents new evidence for the effect of the mandatory establishment of the independent director mechanism in listed/OTC companies on their investment in intangible assets.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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