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The influence of diversification on business performance

and the impact of the institutional ownership to the firm valuation

Abstract: On the basis of reviewing the existing research, this paper puts forward the research hypothesis that diversification may reduce the business performance of enterprises. However, for technology enterprises, diversification means relatively lower risks on the one hand, and potential synergies in related businesses on the other hand. As a result, the market is likely to give it a higher valuation than a single operation. The impact of institutional investors on the valuations of diversified Nasdaq-listed companies may be even more pronounced.

Using the data of Nasdaq Select index related listed companies from 2015 to 2019, we proved these theoretical assumptions. (1) Diversification reduces the profitability and operation capacity of the company to a certain extent. However, the solvency of diversified enterprises has been improved to a certain extent, which is mainly due to the differences in the use cycle of various business funds after decentralized operation, leading to the reduction of corporate debt pressure. In addition, diversification does not affect the growth of enterprises. (2) Diversification actually distracted the risks by diversifying investment. As a result, investors value companies with diversified investments at a higher price. (3) When we add the shareholding situation of institutional investors into the model, we find that the existence of institutional investors leads to an increase in the valuation of diversified enterprises.

Contents Table

1. Introduction	5
1.1 Research background	5
1.2 Research Significance	7
1.3 Research Design	7
2. literature review	9
2.1 The definition of the concept of diversification	9
2.2 The measure of diversification	10
2.3 Impact of diversification on enterprise operation and valuation	13
2.4 Summary	16
3. Theoretical analysis and research hypothesis	16
3.1 Theoretical Analysis	16
3.1.1 Transaction cost theory	16
3.1.2 Principal-agent theory	17
3.2 The relationship between diversification and firm performance and valuation	19
3.2.1 Diversified operation and corporate performance	19
3.2.2 Diversification and enterprise valuation	20
4. Research design	21
4.1 Sample selection and data sources	22
4.2 Variable Selection	23
4.2.1 Measured variables of diversification strategy	24
4.2.2 Measure variables of a company's financial performance	24

4.2.3 Measured variables of company valuation	28
4.2.4 Shareholding ratio of institutional investors	30
4.2.5 Control variables	30
4.3 Empirical model setting	32
5. Analysis of empirical results	34
5.1 Descriptive Statistics.....	34
5.2 The impact of diversification on financial performance	37
5.2.1 Does diversification affect the profitability of the company.....	37
5.2.2 Does diversification affect the Operating capacity of the company	39
5.2.3 Does diversification affect the Solvency of the company	41
5.2.4 Does diversification affect the Growth capacity of the company	43
5.3 The impact of diversification on valuation	45
5.4 The impact of diversification on valuation	46
6. Conclusion.....	48

1.Introduction

1.1 Research background

Under the background of economic globalization, diversification, as a strategic choice, is highly valued by business circles around the world. One of the criteria for judging whether the diversification of an enterprise is reasonable is whether it can improve the value of the enterprise, especially the investment value of the shareholders. Some theoretical studies show that the implementation of diversification can give full play to the internal advantages of the enterprise, reduce the operating risk of the enterprise and continuously enhance the value of the enterprise itself. Diversified enterprises can be seen as a combination of multiple single-operated enterprises to form an enterprise to conduct business activities, creating an opportunity for the management authority to coordinate and manage different operating departments. Managers in this enterprise can allocate resources in different business directions through administrative means, thereby reducing transaction costs, efficiently solving resource allocation problems, and bringing higher returns to the enterprise.

In recent years, the relationship between diversification and corporate value has gradually become a hot topic of research and discussion in academia and industry. Existing research has produced several different and distinctive views:

One of them stated that a diversified business model can enhance the listed company's ability to resist external risks, eliminate the threat of competition and enable the sharing of resources within the enterprise. In addition, it can rationally redistribute resources within the company in the internal capital market, so as to break the restrictions on financing in the external capital market, create more value, and achieve the effect of $1 + 1 > 2$. This is the so-called diversification premium. Another point of view is that once a listed company

chooses to diversify, it will lead to the dispersion of internal resources of the company, increase the difficulty of organization and management, reduce the coordination ability, and weaken the competitive advantage of the company. At the same time, due to limited internal funds, there may be over-investment or under-investment, which may lead to investment risks due to diversification and reduce the value of the enterprise. There is also a view that diversification is not related to enterprise value.

In particular, some studies believe that although enterprises in the process of diversification, their profits and output have increased significantly. However, enterprises may be taking more risks in the process of diversified management. As a result, there is a discount in the valuation of diversified enterprises. In other words, the valuation of diversified companies is always lower for companies with similar business performance and growth. The empirical study shows that the valuation discount phenomenon is more common in diversified enterprises. Scholars from various countries have further explored the theoretical relationship between diversification and enterprise value. So far, many different viewpoints have been generated, including diversified value spillover theory, diversified discount theory and value invariance theory. Most of the existing research are carried out from the perspective of strategic management. In addition to discussing the value of diversified companies from this perspective, some have tested the development of diversification with empirical evidence. But these studies have many gaps. For example, it not only fails to consider how enterprises choose and carry out diversified management to enhance enterprise value, but also lacks analysis of the logical relationship between diversified development strategy and enterprise value evaluation.

1.2 Research Significance

In essence, diversification is also a way to expand enterprises and improve market share. When enterprises reach a certain stage of operation, the vast majority of enterprises will choose to expand the scale of operation through diversification so as to reduce operating costs and improve marketing level. However, not all enterprises are suitable for diversification and can use it to enhance their value. Studies show that proper application of diversification will promote the development of enterprises, on the contrary, if improper application may cause enterprises into difficulties, and even reduce the value of enterprises.

This dissertation defines the concept of diversification and the connotation of the value of listed companies, discusses the theoretical framework and thinking of the value analysis of listed companies diversified enterprise, and provides a perspective based on financial statement analysis, and with the help of profit forecast, valuation model and the comparison of the market value of enterprises before and after diversification, etc. It helps investors and managers objectively and scientifically evaluate the diversification of enterprises and provides reference for investors to invest. At the same time, it has a certain guiding role for enterprise managers whether and how to implement diversified management to increase enterprise profits and enhance enterprise value.

1.3 Research Design

From the reality, the company in the implementation of diversification strategy, there are still some problems can not be ignored. For example, the blind implementation of diversification without considering the actual operating level of the company, resulting in losses of the company, there is the problem of excessive implementation; Due to the difficulty in responding to the external environment and the lack of flexible operation

mechanism, some companies can not make full use of the remaining resources, risk can not be effectively transferred, and there are problems of insufficient implementation.

According to the research content of this dissertation, the architecture is divided into five chapters.

Chapter one is Introduction. This chapter outlines the research background and significance, and outlines the research ideas of the thesis. Based on the life cycle theory, this thesis proposes a research purpose to explore the relationship between NASDAQ's diversification and financial performance, and provides basic framework guidelines for the empirical analysis and policy recommendations.

Chapter two is Literature Review. This chapter summarizes the definition of diversification, the measurement of diversification indicators, and the impact of diversification on enterprise performance and valuation, summarizes previous research results, and clarifies the main line and research ideas of this thesis.

Chapter three is theoretical analysis and research hypothesis. This chapter mainly analyzes the specific impact of NASDAQ-listed companies' diversification on corporate financial performance and diversification on corporate valuation from a theoretical perspective. And the impact of Nasdaq's diversification on the overall financial performance under different life cycle stages is also clarified, which provides a reference for NASDAQ-listed companies to carry out its diversification strategy.

Chapter Four is empirical research and results discussion. This chapter explains specific research methods, relevant data sources and processing methods, model architecture, descriptive statistics of relevant variables and specific regression analysis. Combined with the theoretical analysis, this chapter verifies the research hypothesis and specifically analyzes the reasons leading to the results of empirical analysis.

Chapter five is the conclusion and prospect.

2.literature review

Since the wave of enterprise merger in the 1970s, scholars have started to study the diversification of enterprise management and obtained abundant research results. According to the research ideas of this thesis, we have sorted out and analyzed the existing research from four aspects: how to define enterprise diversification, how to measure the degree of enterprise diversification, the impact of enterprise diversification on financial performance, and the impact of enterprise diversification on enterprise value.

2.1 The definition of the concept of diversification

Klier (2009) defined diversification as two aspects of operating state and operating process. Enterprises in different operating states will show different diversified product management modes, enterprises in different operating processes will also explore diversified business markets and business fields, which fully shows the characteristics of diversity.

Bernheim and Winston (1990) believe that diversification is actually a kind of "compromise" behavior, whose essence is to coordinate and balance the interests of competitors and themselves, and reduce their aggression in a certain market field by expanding into different market fields, mainly for diversification from different market perspectives.

Ansoff (1957) focused on the products that companies operate and produced, arguing that the market can be divided into different fields according to the type and applicability of the company's products. He emphasized that developing emerging markets by producing

new products is a business model for growing companies to sell and launch new products into new markets to expand market share.

Gort (1962) believed that two products exist independently in the market if they have small cross-elasticity of demand and the resources required to produce them cannot be transferred and influenced by each other in a short term. The supply of several products in an independent market is called diversification.

Since then, Pitts and Hopkins (1982) have used the term "business" instead of "industry" or "market" and redefined the concept of diversification. Jingoo Kang (2013) believes that the essence of enterprise diversification is to balance the relationship between existing resources and future resources. When the implementation of diversification does not lead to the mutual influence of corporate cash flow, then diversification will help reduce business risks and improve the level of financial performance.

Graham Kenny (2011) defined diversification as a way to expand the scale of the industry and increase the competitive advantages of enterprises in different market areas through mergers and acquisitions, so as to improve corporate performance and increase corporate profits. He believes that financial indicators can be used to measure the operating status of enterprises, and incentive means can be used to improve the decision-making level of operators and managers, so as to develop diversification into a sustainable strategy of enterprises.

2.2 The measure of diversification

There are many indicators for the measurement of diversification, and some representative propositions mainly include Herfindahl Index (HHI), Entropy Index (EDI), Number of Operating Items (N) and Specialization Rate (SR).

First, the Herfindahl Index (HHI). It is commonly used to measure the concentration degree of equity or property rights. Specifically, it is the sum of squares minus the percentage of total assets or total income of each competitive subject in an industry in the whole market, so as to reflect the concentration degree and dispersion degree of property rights of the scale of the manufacturer. This measure not only examines the number of companies' businesses or products, but also covers the proportion of each business or product in the industry's total assets, which clearly and directly reflects the company's degree of diversification. For a company, the larger the calculated HHI, the more diversified the company is, and its value usually ranges from 0 to 1. The HHI can easily and intuitively reflect the degree of diversification of different companies, and is a widely used measure by economists and scholars. The formula for calculating the HHI is given in this thesis as follows:

$$HHI = 1 - \sum_{i=1}^N P_i^2, P_i = \frac{X_i}{X}$$

Among them, X represents the total assets or total revenue of all businesses in the company; X_i represents the total assets or revenue of the i -th business in the company; $P_i = X_i/X$ represents the proportion of the total revenue (total assets) of the i -th business in the company to the total revenue (total assets); N represents the total number of individual businesses within the company.

Second, the entropy index (EDI). From the existing literature, Berry and Jacquemin (1979) first used the index of entropy (EDI) to measure the degree of diversity. It mainly uses a four-digit code, the first two of which are industry categories, and the latter two represent the company's industry category or special industry category. Its calculation formula is:

$$EDI = \sum_{i=1}^N P_i \ln \frac{1}{P_j}$$

Among them: P_i represents the proportion of the company's sales in the i th business (product) to the total sales. The larger the value of the entropy index, the higher the degree of diversification of the company, and vice versa.

Third, the number of operating projects (N). Existing studies mainly set thresholds and calculate the number of operating items according to the number of participating industries announced in the annual reports of listed companies, or the proportion of business (product) income and assets of enterprises in various industries, so as to measure the diversified operation of enterprises. The higher the number of projects, the higher the degree of diversification of the company, and vice versa.

Fourth, the specialization rate (SR). The specialization rate is generally based on the relevant information and values of the industry (product) with the largest proportion of main business income disclosed in the company's annual report, and the proportion of the main business income of the largest business (income) to the company's total operating income is measured. The larger the value of the specialization rate, the lower the degree of diversification of the company, and vice versa.

To sum up, through the measurement of the above four diversification indicators, it can be found that the number of business projects indicator (N) and specialization rate (SR) are relatively simple to measure and calculate, but accurate analysis and calculation are required by using the information and values disclosed in financial statements. On the one hand, due to the use of manual finishing calculation, easy to appear errors; On the other hand, the semi-annual report issued by the SEC does not require companies to disclose

their main business by industry, but only by product and region, so it is not suitable to make a full response to diversification.

Entropy index has high requirements on the degree of segmentation of enterprises in different industries, and incomplete data will appear in the process of data collection of listed companies, so the measurement of entropy index will have a great impact. The Herfindahl index is not only a good measure of the diversification degree of listed companies, but also widely used by many scholars and economic experts because relevant data are obtained from many sources. Therefore, this thesis will take the Herfindahl index as a measure of corporate diversification.

2.3 Impact of diversification on enterprise operation and valuation

Diversification belongs to the strategic level of the company as a whole and has an important impact on the increase of shareholders' wealth and the evaluation of company value. Existing research has drawn rich research conclusions mainly by exploring the relationship between enterprise diversification and financial performance. This involves the calculation of corporate financial performance and the relationship between diversification and corporate financial performance.

The financial performance of an enterprise is an important indicator for judging the growth status of an enterprise. The commonly used methods for evaluating the financial performance of an enterprise include the single-index evaluation method and the multi-index comprehensive evaluation method. The indicators commonly used in the single indicator evaluation method are: return on investment, economic value added, Tobin's Q value, return on equity and so on. The indicators commonly used in the multi-index comprehensive evaluation method are: factor analysis method, comprehensive scoring method and balanced scorecard method.

After Norton and Kaplan proposed that the principle of balanced scorecard could be applied to corporate strategic management, scholars tend to divide financial performance indicators into four dimensions, namely profitability, debt paying ability, operating ability and growth ability, to weigh the financial performance of enterprises in a qualitative and quantitative way. These studies not only pay attention to internal and external factors, but also introduce other subjective indicators to evaluate the financial performance of enterprises from multiple perspectives and multi-dimensions. For example, Louca. and Petrou (2016) believe that A company's financial performance can be divided into three aspects: efficiency, effect and adaptability. Efficiency is usually measured by the ratio of the revenue a firm earns to the capital invested. The effect is mainly reflected in the evaluation of the results of the same trade competition. Adaptability is measured by how well a company responds to external threats and emergencies, as well as changes in the environment and opportunities.

In terms of the diversification premium theory, the premium theory represented by Park(2002) believes that the total profits obtained by enterprises with related diversification are greater than those obtained by enterprises with unrelated diversification. CamPa and Kedia (2002) also believe that with the increase of the company's diversification level, the financial performance level will be significantly improved, that is, the diversification premium effect exists. Villalonga (2004) studied the diversification of listed companies and found that although diversification increased the operation and financial risks of enterprises to a certain extent, it significantly promoted the improvement of financial performance and profitability of enterprises.

In terms of the discount theory of diversified operation, represented by Imen(2011), through studying the diversified operation mode of American listed companies, the author concludes that coordinated allocation of resources to make up for cultural differences will

have a negative impact on corporate financial performance. Gu, Yang and Strange (2018) found that diversification was negatively correlated with financial performance in global manufacturing enterprises, especially for high-tech enterprises, which was not conducive to the long-term and stable development of enterprises. Lin et al. (2005) also explored the relationship between product diversification and corporate financial performance from the perspective of group products and found significant negative correlation between the two. Claessens (2002) studied the internal business activities of enterprises and found that when principal-agent relationship lacks a strict and effective restraint mechanism, large shareholders will "tunnel dig" through diversified operation, which damages the interests of enterprises and minority shareholders, affects the performance level of enterprises and reduces the value of enterprises.

In terms of the "inverted U" theory of diversification, Zahavi and Lavie (2013) believes that there is not a linear relationship between the diversification and financial performance of American software companies. In the short term, the diversification of the company has a restraining effect on the financial performance, there is a discount phenomenon. However, with the gradual deepening of diversification, the company-wide economic effect is significant, diversification will promote the development of corporate performance, the overall existence of an "inverted U" relationship. Some scholars represented by Hashmi and Mehmood (2016) believe that there is an "inverted U-shaped" linear relationship between diversification and corporate financial performance. Benner and Zenger (2016) also pointed out that the adverse selection risk between the market and the enterprise can be fully reduced in the process of diversification, so as to improve the company's financial performance.

2.4 Summary

As can be seen from the above literature, scholars have studied diversification from multiple perspectives and obtained many important conclusions. In general, the company's diversification has an important impact on financial performance. For the correlation between diversification and corporate financial performance, scholars have obtained different research results according to different research objects. Some scholars believe that diversification is positively correlated with financial performance. Some scholars believe that there is no significant correlation between diversification and financial performance. Some scholars believe that there is an "inverted U" relationship between diversification and financial performance. Some scholars also study the relationship between diversification and financial performance from the perspective of life cycle and believe that diversification in different life stages has different impacts on financial performance. Among them, the mainstream view is that with the increase of diversification, the financial performance level of enterprises will be significantly reduced.

3. Theoretical analysis and research hypothesis

3.1 Theoretical Analysis

3.1.1 Transaction cost theory

As for the transaction cost theory, Coase (1937) discussed the existence, merger and diversification of companies around transaction costs, and made an in-depth study on the reasons and rationality of the existence of companies. Williamson (1975) further discussed the problems of corporate merger and diversification, pointing out that special assets have particularity. When a transaction subject conducts a specific investment, it will increase the

cost at the cost of transferring the trading partner, which reflects that the transaction cost increases with the increase of asset specificity.

Based on the transaction cost theory, Santalo and Becerra (2008) found that the relationship between diversification and financial performance depends on the industry category of the enterprise. If an enterprise is involved in a hot industry with high requirements for specialization, the implementation of diversification strategy is not conducive to the improvement of financial performance of the enterprise. If a company is involved in unpopular industries with low specialization, diversification will improve the financial performance of the company and increase the value of the company.

The inspiration of transaction cost theory for this study lies in: Both market environment and resource endowment of an enterprise will affect the performance of diversified operation. Only when diversified management reduces transaction costs can it improve business performance. From this point of view, there is uncertainty about the influence of operation distance on enterprise performance.

3.1.2 Principal-agent theory

As for the principal-agent theory, the earliest proposer believed that enterprises should separate management rights from ownership. Principal-agent theory is built on the premise of information asymmetry. One party can grasp the information that the other party does not have, which easily leads to moral hazard and opportunism, leading to principal-agent problems.

Jensen and Mecking (1976) made an in-depth study of the agency problem through a formal theoretical framework and believed that the agency relationship is actually a contractual relationship. The principal entrusts the agent with certain decision-making power, so that the agent is engaged in relevant business activities and strategic decisions.

But principals and agents often have conflicts of interest because of their different personal preferences. The output right of the agent will decrease with the decrease of the share of shares, which will lead to the agent occupying a large amount of resources of the company in the form of extra subsidies, increasing the input cost of the shareholders, bringing serious negative externalities, damaging the interests of the principal and the shareholders of the company, and resulting in the loss of the company value.

Natasha (2010) believes that principal-agent relationship is a relationship in which the principal seeks help from the agent, and the agent takes this opportunity to help the principal take action on a single matter and solve the problem for the principal.

Aggrawal & Samwick (2006) believed that continuous and effective contractual constraints could help solve the problem of insufficient investment of enterprises and promote the development of enterprises in production and operation.

Olive Hart (2010) believes that principal-agent relationship is based on the ability difference between different people. When a person has rich professional abilities and core skills, he or she will be chosen to engage in professional matters in this field and act as an agent to help clients solve problems. Principal-agent relationship is actually based on the authorization of the principal, the agent handles matter for the principal. Based on the static cash holding tradeoff theory, they study the influence of agency problem and cash holding level on sample firms that adopt diversified management. It is found that diversified companies have significant internal capital market advantages and the degree of diversification is negatively correlated with cash holdings. This shows that the complex organizational structure will lead to some agency conflicts, which weaken the function of diversification to reduce cash holdings and seriously affect the corporate governance level.

Based on the principal-agent theory, Scharfstein & Stein (2000) believed that enterprise managers aim to maximize their own interests in the process of production, operation and decision-making. However, it ignores the overall interests of enterprises and shareholders, which leads to the phenomenon of diversification discount.

3.2 The relationship between diversification and firm performance and valuation

3.2.1 Diversified operation and corporate performance

At present, there have been a lot of studies on the correlation between diversification and corporate financial performance, but the results are quite different. Some studies believe that diversification will promote the improvement of corporate financial performance. However, some scholars believe that diversification has no significant impact on corporate financial performance. In addition, some studies believe that moderate diversification can improve financial performance, while excessive diversification can reduce financial performance, that is, there is an "inverted U-shaped" relationship. From the perspective of the company's life cycle, some studies believe that diversification in different development stages has different impacts on financial performance.

In this paper, we plan to use NASDAQ listed companies as the research sample. Most of the companies in the sample are high-tech enterprises with small scale, flexible operation mechanism and good growth. For such enterprises, diversification will reduce the advantages of flexible operation and good growth to a certain extent, and may increase the coordination costs within the group enterprises. This will bring about the decline of business performance. Based on the above analysis, this paper proposes the following hypotheses:

H1: Among listed companies that implement diversification, the higher the degree of diversification is, the lower the company's financial performance level is, that is, the overall degree of diversification is positively correlated with the company's financial performance.

3.2.2 Diversification and enterprise valuation

Considering that the listed companies selected in this paper are all Nasdaq listed companies. Most of these companies are high-tech and high-growth enterprises. Profitability does not often determine the value of tech companies. Investors and investors tend to place more value on the potential growth of listed companies. Diversified listed technology companies often have two characteristics. One is that diversification means more possibilities and therefore more potential growth expectations. And the synergistic effect between various businesses of the enterprise may be higher. Second, diversified operation means lower risk. Compared with single-operation enterprises, diversified enterprises have stronger ability to resist risks.

Academically, there are two different views on the governance role of institutional investors: some scholars believe that institutional investors. They will not actively monitor the company's operating conditions, that is, they will "vote with their feet" and only achieve short-term profit demands through frequent turnover transactions. Porter (1992) found that institutional investors may conspire with the management to obtain relevant private returns and damage the interests of other investors and shareholders. Based on the long-term corporate governance view, other scholars have found that institutional investors can actively participate in the daily business activities of enterprises through their own investment advantages, capital advantages, information advantages and team advantages, so as to improve corporate governance input and control income uncertainty. Chung et al. (2002) believe that institutional investors in the capital market, as part of the external

supervision mechanism, can improve the supervision efficiency, improve the quality of accounting information of listed companies, and timely insight into the behavioral deviation of management, thus playing a significant role of constraint.

In my opinion, for institutional investors, whose degree of specialization is higher, they can often obtain unexpected information about the financial data of listed companies. In this sense, institutional investors are likely to give a higher valuation to diversified investors. The higher the shareholding ratio of institutional investors, the greater its impact on the valuation of listed companies, and the valuation of diversified enterprises may be higher.

Based on this, we put forward the theoretical hypothesis:

H2: Diversified Nasdaq-listed companies, the valuations are also likely to be high than those of similar companies.

H3: Higher institutional stakes could boost valuations of diversified Nasdaq-listed companies.

4. Research design

Through the above theoretical analysis and the summarization of the scholars' research results, the relevant hypothesis of the relationship between the diversification operation and the corresponding financial performance is put forward. In order to better test the hypothesis, this dissertation uses the relevant data of NASDAQ listed companies to test this relationship, and further discusses the relationship between corporate diversification and corporate valuation, so as to put forward relevant suggestions on how diversification can improve the financial performance of listed companies. Stata15 is the software used for empirical analysis in this thesis, and MS Office Excel 2007 is the software used for preliminary processing of original data.

4.1 Sample selection and data sources

One of the key purposes of this study is to study the impact of Nasdaq-listed companies' diversification on financial performance and corporate valuation. In order to enable the collected data to effectively test relevant hypotheses, this dissertation selects NASDAQ-listed companies from 2015 to 2019 as the research sample. The data in this interval is selected for the following reasons: First, during this period, the US market basically got rid of the impact of the international financial crisis and the European debt crisis. Second, the data for this period also sidestepped the impact of the COVID-19 pandemic in early 2020 on the stock market.

In order to ensure the accuracy of the sample data as much as possible, the following selection principles are adopted: First, to eliminate the sample of listed companies whose relevant data are missing, incomplete and unable to distinguish whether they belong to diversified management; Second, excluding listed companies that do not list corresponding main business income by industry in any annual financial report; Third, Companies with excess losses in the sample years were excluded. On this basis, this dissertation uses panel data to analyze the impact of Nasdaq-listed companies' diversification on financial performance and valuation, and puts forward corresponding improvement suggestions.

In this paper, the basic data related to the diversification degree of the sample companies are mainly from the annual financial reports of the sample companies and Yahoo Finance, covering the annual sales revenue, cost, operating income and other relevant financial ratio data. The data related to the financial performance of the sample companies and the operation situation of different industries mainly come from WRDS database. Excel software is used to preprocess the collected original data, and Stata15

software is used for statistical analysis and multiple regression analysis of the processed data.

4.2 Variable Selection

This dissertation takes NASDAQ listed companies as the research object and comprehensively considers such factors as the company's asset-liability ratio, company size, company age and company's growth ability, and empirically studies the difference in the impact of diversification on financial performance and market valuation level within the sample.

Among them, when analyzing the financial status of listed companies, this dissertation measures 12 indicators in total, including profitability, solvency, operating ability, and growth. When analyzing the valuation of listed companies, this dissertation uses PE to represent the valuation level of listed companies, takes the asset scale of listed companies in various industries as the weight, and the average PE value of listed companies with non-diversified operations in the corresponding industry is used as the core indicator to calculate the market fair valuation level of listed companies. This dissertation will further calculate the discount degree of the actual PE of listed companies compared with the market level, so as to calculate whether there is widespread discount in the valuation among diversified listed companies. Correspondingly, this paper takes the dummy variable of whether the listed company conducts diversification as the explanatory variable, takes the financial status and valuation status of the listed company as the explained variable, and adds the control variable to carry out the regression analysis. In this way, dissertation examine the impact of company diversification on financial performance and valuation, and provide reference for the diversification of Nasdaq-listed companies.

4.2.1 Measured variables of diversification strategy

Through the analysis of financial statements and data statistics of Nasdaq-listed companies, this dissertation finds that the number of fully specialized companies (that is, only operating a single business) in the listed companies is very small, and the degree of diversification varies greatly among different companies. Combined with the above research on the indicators of diversification,, this thesis defines diversified companies by calculating the industry distribution of its main business.

4.2.2 Measure variables of a company's financial performance

Nasdaq-listed companies generally have greater development potential and higher price-earnings ratios, their main businesses are prominent, and investors are more optimistic about their development prospects and investment returns. However, the applicability of different Nasdaq-listed companies to financial performance is quite different. Therefore, when evaluating the financial performance of Nasdaq-listed companies, the selection of measurement indicators is particularly important, which will directly affect the comparison of financial performance levels of different types of Nasdaq-listed companies, and then affect the company's decision-making behavior.

Combined with the above requirements, this paper selects the main indicators that reflect Nasdaq's profitability, solvency, operating ability and growth ability to measure the company's overall financial performance. In order to make the selection of indicators more standardized and reasonable, the following principles are determined in this study: First, each measure is an intuitive response to the corresponding ability it represents; Second, the indicators under a certain capability can complement each other in order to comprehensively measure the corresponding capability; Third, each measurement indicator can not only reflect the company's short-term capabilities, but also has important

significance for measuring the company's long-term development; Fourth, the calculation method of each measurement index is relatively simple, and the relevant data is easy to obtain.

A. Profitability

The indicators that reflect the company's profitability include operating profit rate, return on assets (ROA) and return on equity (ROE).

Operating profit margin is the ratio of the total operating profit of the company to the total sales revenue, which can intuitively reflect the operating efficiency of the company. The higher a company's operating profit margin, the more profit each unit of sales provides, and the more profitable it is.

The return on total assets (ROA) is the ratio of the company's operating net profit to the average total assets, and is an important indicator to measure the company's profitability. This indicator is helpful for managers to grasp the persistence and stability of the company's profitability, and it is convenient for managers to have a clear understanding of the utilization efficiency of assets, which is helpful to measure the company's operating level.

The return on equity (ROE) is the ratio of a company's after-tax profits to its net assets, and it is an intuitive reflection of the company's shareholder returns. The higher the company's return on equity, the more profits the investment has formed, and the more helpful it is to measure the operating efficiency of the company's own capital.

B. Solvency

Liquidity ratio, equity multiplier and quick ratio are selected as indicators reflecting the company's solvency.

The current ratio is the ratio of the company's current assets to current liabilities at a specific point in time, which is used to measure the company's ability to realize current assets and use it to repay debts before short-term debt matures. The larger the value of the company's current ratio, the stronger the liquidity of the assets, and the stronger the solvency at the same time.

Equity multiplier is the ratio of a company's total assets to total shareholders' equity, and is an important indicator to measure a company's financial leverage. The larger the value of the equity multiplier, the smaller the proportion of shareholders' equity in total assets, the greater the company's financial leverage, and the higher the degree of debt.

The quick ratio is the ratio of the company's quick assets to current liabilities at a specific point in time, which is used to measure the company's ability to realize current assets and repay current liabilities in a short period of time. If the value of the quick ratio is too low, it will affect the company's solvency. If the value is too high, it will waste the company's resources and increase the investment cost. Therefore, the value should be controlled at a reasonable level.

C. Operating capacity

Accounts receivable turnover, inventory turnover and current assets turnover are selected as indicators reflecting operating capacity.

The accounts receivable turnover ratio is the ratio of the company's total operating income to the average accounts receivable balance, reflecting the turnover rate of the company's accounts receivable. This indicator represents the frequency of the company's accounts receivable into cash, which is the time it takes to convert the company's accounts receivable into the company's cash, and can measure the company's capital turnover level.

The inventory turnover ratio is the ratio of the company's total operating costs to the average inventory balance, reflecting the number of times the company's inventory turns over. A reasonable inventory turnover ratio not only enables the company to maintain a stable operating capacity, but also improves the company's short-term solvency and capital efficiency.

The current asset turnover ratio is the ratio of the net operating income to the average total current assets, and is an important indicator to measure the utilization rate of a company's assets. The full use of current assets can not only create investment income, but also expand sales and improve the utilization efficiency of current assets.

D. Growth capacity

The growth rate of total assets, net profit and operating income are selected as the indicators reflecting the growth capacity of the company.

The growth rate of total assets is the ratio of the growth of the company's total assets at the end of the year to the total assets at the beginning of the year, and is an important indicator to measure the company's development capability and capital accumulation capability. The higher the index value, the greater the expansion scale of the company in a certain period. At the same time, it is necessary to evaluate the development potential of the company and avoid blind expansion.

Net profit growth rate is the ratio of the company's current net profit growth to the previous period's total net profit. It is an important indicator to measure the company's scale and growth factors. The larger the net profit growth rate is, the stronger the company's ability to expand and the better the growth potential.

The growth rate of operating income is the proportion of the company's current operating income increase to the previous year's total operating income, and is an important indicator to measure the company's development status and growth ability. The larger the value of this indicator, the better the growth of the company, the better the development prospects, and the faster the growth rate of operating income.

On the basis of determining the relevant indicators, this paper adopts the principal component analysis method to synthesize a comprehensive evaluation index to measure the company's financial performance. The relevant financial performance evaluation system is shown in the following Table.

4.2.3 Measured variables of company valuation

The price-earnings ratio is one of the important indicators reflecting the valuation level of listed companies. Price Earnings Ratio refers to the ratio of the stock price divided by the earnings per share (EPS). It can also be calculated by dividing the company's market capitalization by annual shareholder earnings. When calculating PE, the latest closing price at the time point is usually used as the stock price of the listed company. In terms of EPS, if calculated based on the published EPS of the previous year, it is called the historical price-earnings ratio (historical P/E). When calculating the estimated value of EPS used to estimate the P/E ratio, consensus estimates are generally used, that is, the average or median of the forecasts obtained by the institutions tracking the company's performance by collecting the forecasts of multiple analysts.

The P/E ratio used in this study is calculated by taking the estimated EPS of the current year as the denominator and the closing price of the stock at the end of the year as the numerator. After examining the P/E ratio of listed companies, this dissertation uses the weighted P/E ratio of similar listed companies as a benchmark to calculate the valuation

discount (or premium) of listed companies. According to the proportion of industry sector revenue, this dissertation can calculate the valuation of each listed company, which is actually the weighted sum of the valuation of each industry sectors. This dissertation takes the median P/E ratio of the industry to which each business belongs as the standard P/E ratio of the listed company. The benchmark P/E ratio of listed companies can be calculated by weighting the weight of each business of listed companies.

$$PE^e = \sum_{j=1}^n w_j PE_j$$

Among them, PE represents the P/E ratio of listed companies. w_j represents the proportion of the sales revenue of the listed company in the j sector to its total sales revenue, PE_j is the median PE of listed companies with j-type business in the market. On this basis, the discount (or premium) of the listed company's valuation can be further calculated:

$$Discount_{it} = \ln \left(\frac{PE_{it}}{PE_{it}^e} \right)$$

In the research of this paper, $Discount_{it}$ is used to represent the degree of deviation between the valuation of listed companies and market expectations. When the diversification variable is negatively correlated with $Discount_{it}$, it means that there is such a valuation discount in diversified companies. On the contrary, if the diversification variable is positively correlated with $Discount_{it}$, it means that there is a valuation premium for a diversified company.

4.2.4 Shareholding ratio of institutional investors

To verify the impact of institutional investors' shareholding on the valuation of listed companies. We need to combine both. First, institutional investors' shareholding must reach a certain scale before it can have an impact on the valuation of listed companies. Second, single (or top shareholding ratio) institutional investors hold a larger number of shares. Only then can institutional investors have the ability and willingness to influence the decisions of listed companies and change the market valuation. Therefore, we choose the shareholding ratio of the top five institutional investors as the institutional investor variable

4.2.5 Control variables

When conducting empirical analysis, the introduction of control variables can effectively exclude the influence of some important variables on the explained variables, thereby enhancing the explanatory effect. In this study, the company's debt-to-equity ratio (DEBT), company size (SIZE), and company age (AGE) are used as control variables. In this paper, DEBT, AGE and GROW are selected as control variables because the above indicators have an important impact on the company's diversification expansion and financial performance. SIZE is selected as the control variable because large-scale companies can better achieve economies of scale, enable companies to implement diversified business strategies, and thus affect the company's financial performance.

1. DEBT. Asset-liability ratio has a great impact on the company's solvency and operating capacity, and to some extent, it will affect the company's operating decisions. For the diversified NASDAQ-listed companies, on the one hand, the asset-liability ratio of the company will bring tax benefits to the company, but on the other hand, it will increase the company's operation and financial risks, affect the company's solvency and operation ability, and make the company face the risk of bankruptcy.

2. SIZE. In this study, the company size is measured by the total amount of company assets at the end of the year, but considering that if the asset size is too large, it will have a greater impact on other variables in the regression results, so it is expressed by taking the natural logarithm of the net assets at the end of the year.

3. AGE. The third is the age of the company. In this study, the age of a company is measured by subtracting the value of the company's listing year from the year of sample investigation. The specific measurement method is as follows: The age of a company = the year of sample - the year of listing.

4. SHARE. The shareholding ratio of major shareholders of a company usually reflects the corporate governance structure, while the decision-making and formulation of diversified business strategy of a company depend on a sound governance structure, which will have an important impact on the financial performance of the company.

5. GROW. The growth capacity of a company reflects the development potential of the company. It is precisely because investors are optimistic about the development potential and return on investment of Nasdaq-listed companies that they urge the company to seek diversification to obtain higher returns, thus affecting the company's financial performance.

The list of variables in this thesis can be summarized as follows:

Table Variable comparison

The variable name	Abbreviations
price earning ratio	pe
Whether to diversify	diversification
Is there a discount to the valuation	discount

Return on equity	roe
Return on total assets	roa
The profit margin	npr
Accounts receivable turnover	operation_a
Inventory turnover	operation_b
Current asset turnover	operation_c
Current ratio	debt_a
Quick ratio	debt_b
The rights and interests multiplier	debt_c
Growth rate of net assets per share	grow_a
Year-on-year growth rate of total operating revenue	grow_b
Year-on-year growth rate of operating profit	grow_c
Total assets	asset
Asset-liability ratio	liability_ratio
Set up the year	fund_date

4.3 Empirical model setting

As mentioned above, this dissertation will use the data from 2015 to 2019 of selected stocks (1,600 in total) in NASDAQ-listed companies to examine the impact of listed companies' diversification on their operating performance and valuation levels. Following this logic, this dissertation will build empirical models and make estimates to test research

hypotheses. In the process of empirical research, this dissertation will use Stata15 to estimate the multiple regression model to test the hypothesis proposed in this paper. The specific empirical research is divided into the following steps:

(1) Examine the impact of a company's diversification on its financial performance. In this part of the study, a total of 12 corporate financial indicators of the four categories mentioned above were taken as explained variables, whether the company has diversified operation was taken as explanatory variables, and the company's asset scale, debt ratio and company age were taken as control variables for regression analysis. Model 1 is constructed based on hypothesis H1:

$$financial_{it} = \alpha_0 + \beta_1 diversification_{it} + \beta_2 Asset_{it} + \beta_3 EBIT_{it} + \beta_3 Age_{it} + \varepsilon$$

(2) Test the impact of the company's diversification on the company's valuation level. In this part of the research, the listed company's PE (Price/Earning) is used as the explained variable, the company's diversification is used as the explanatory variable, and the company's asset size, debt ratio and company age are used as control variables to carry out regression analysis. Model 2 is constructed based on hypothesis H1:

$$PE_{it} = \alpha_0 + \beta_1 diversification_{it} + \beta_2 Asset_{it} + \beta_3 EBIT_{it} + \beta_3 Age_{it} + \varepsilon$$

(3) Test the impact of the company's diversification on the company's relative valuation level. In this part of the study, the ratio of PE (Price/Earning) and matched average PE of listed companies was taken as the explained variable, the diversification of the company was taken as the explanatory variable, and the company's asset scale, debt ratio and company age were taken as the control variables for regression analysis. Model 3 is constructed based on hypothesis H1:

$$Discount_{it} = \alpha_0 + \beta_1 diversification_{it} + \beta_2 Asset_{it} + \beta_3 EBIT_{it} + \beta_3 Age_{it} + \varepsilon$$

(4) Verify the impact of institutional investors on the discount rate of multi-yuan Chinese enterprises. In this part of the study, the ratio of PE (Price/Earning) and matched average PE of listed companies was taken as the explained variable, The company's asset scale, debt ratio and company age were taken as the control variables for regression analysis.

We also added the shareholding ratio of the top five institutional investors (Top5) and the interaction between top and the dummy variable of diversification into the model.

Model 4 is constructed based on hypothesis H3:

5. Analysis of empirical results

This part uses Stata15 to perform descriptive statistical analysis on various financial data of the sample companies, and further estimates the aforementioned empirical models (1) ~ (4).

First of all, statistical analysis of various financial indicators of the enterprises in the sample will help to have a systematic and intuitive understanding of the operating conditions of the relevant enterprises, and provide a reference for further analysis.

Secondly, the estimation results of relevant empirical models are helpful to recognize the role of enterprise diversification, thereby verifying the theoretical assumptions proposed above.

5.1 Descriptive Statistics

The descriptive statistics of the company's financial performance show that the financial performance of the sample companies obeys a normal distribution. The statistical analysis of the specific variables is as follows:

(1) The financial status of enterprises in the sample is described and analyzed. As mentioned above, the financial performance is divided into four capability indicators, and each capability indicator is specifically divided into three sub-indicators, so as to explore the impact of enterprise diversification on financial performance. Table 5-1 lists the descriptive statistics of the 12 indicators.

On the whole, since the listed companies with losses were excluded in the analysis, the financial indicators of the companies in the sample are relatively good. The average value of asset growth rate and operating income growth rate is greater than 0.

At the same time, the company's solvency and operational status indicators are also relatively satisfactory. Of course, judging from the standard deviation of 12 financial indicators, there are still great differences in the company's operating conditions, which also shows from one side that the research in this dissertation may be meaningful.

(2) A large proportion of enterprises have carried out the diversification strategy. Data showed that about 55.1% of the observation enterprises had two or more main business, and their income accounted for 10% of the total main business income of the enterprise in that year. It shows that the diversification of selected listed companies listed on NASDAQ has been obvious, while there are about 45% of non-diversified companies. This also creates conditions for comparing the operation and valuation of the two types of companies in the regression analysis.

(3) It can be seen that the average PE of the companies in the sample is as high as 93.859, which is a very high PE. Moreover, the listed company with the highest valuation has a PE as high as 127053.5. This is also understandable. Most of the companies listed on the Nasdaq market are technology-based growth companies. For such companies, the

market often pays more attention to the growth of the company and less emphasis on the current profit, so the phenomenon of PE is generally high.

(4) Company characteristic variables. The average age of NASDAQ listed companies is 32 years old, the average liability ratio is 57.987, and the average asset size is 10037.160million dollars. On the whole, the samples are mainly listed companies that already have a certain development foundation and have good growth potential.

Table 5-1 Descriptive analysis of variables

Variable	Obs	Mean	Std. Dev.	Min	Max
Pe	3,955	93.859	2054.236	0.638	127063.500
Discount	3,955	-0.564	1.025	-8.229	3.792
Roe	3,932	13.252	57.656	-1185.278	1150.478
Npr	3,923	13.724	272.371	-16726.500	360.264
Roa	3,945	5.716	8.039	-109.879	74.121
Operation a	2,729	34.450	371.960	0.682	14202.550
Operation b	1,918	25.058	160.806	0.328	5444.713
Operation c	2,834	2.980	2.746	0.000	25.275
Debt a	2,842	2.938	4.699	0.028	125.103
Debt b	2,039	2.181	2.583	0.061	74.327
Debt c	3,936	3.448	24.163	-956.750	773.500
Grow a	3,867	21.094	596.305	-3264.920	36587.970

Grow b	3,921	12.044	42.530	-100.000	2002.420
Grow c	3,909	29.573	455.111	-11004.070	19207.160
Div	3,955	0.551	0.497	0.000	1.000
Top5	3,544	0.285	0.114	0.000	0.990
Asset	3,940	10037.160	28288.960	7.196	375319.000
Liability ratio	3,935	57.987	27.657	0.409	260.881
Age	3,955	32.341	24.096	0.000	119.000

5.2 The impact of diversification on financial performance

According to the previous ideas, after having a systematic understanding of the operating conditions of the enterprises in the sample, it is necessary to estimate the empirical model and verify the two previous theoretical assumptions.

In order to ensure the reliability of the study, financial indicators of 12 items in four categories of enterprises in the sample this dissertation taken as explanatory variables, valuation level variable of listed companies (PE) and valuation deviation variable of listed companies (the natural logarithm of the ratio of PE and median market valuation) this dissertation respectively taken as explanatory variables for analysis. Table 5-2 to 5-6 shows the estimated results.

5.2.1 Does diversification affect the profitability of the company

First of all, it is necessary to discuss whether the diversification of listed companies affects the profitability of the company. Here, the listed company's Return on equity, the profit margin and return on total assets are used as explained variables. Taking the listed

company's diversification as the core explanatory variable, the regression analysis is carried out, and the multiple regression model is used to test whether the hypothesis of the relationship between this dissertation the two is valid. The specific results are shown in Table 5-2.

It can be seen from the regression results that all three regressions passed the F test at the 1% level, and their F values this dissertation 1.427, 7.731 and 125.491, respectively. It shows that the setting of the model is reasonable, and the explanatory variables have the ability to explain the explained variables. Judging from the regression coefficients of the diversified variables, the regression coefficients of div in the three models are all significant at the statistical level of at least 5%, and the regression coefficients are all negative. This shows that companies with diversified operations have a certain degree of decline in their profitability. This is consistent with our theoretical expectation, that is, after the company's diversification, the diversification of investment reduces the operating risk, but also makens the company's profitability to a certain extent. this dissertation

For the control variable, total assets have a significant positive impact on ROA, but the regression coefficient is small, indicating that the return on assets will increase to a certain extent after the company becomes larger. At the same time, the company's liability_ratio has a negative relationship with roe and roa, and has a positive relationship with npr. The company's Age has a positive correlation with the company's npr and roa.

Finally, according to the results of the regression model, it can be seen that under the action of the control variables, the R2 values all reach above 0.05. This shows that the relevant explanatory variables can explain more than 5% of the total variance of the equation, which meets the minimum requirements for R2 in statistical analysis, and has certain practical significance.

Table 5-2

	(1)	(2)	(3)
	roe	npr	roa
div	-29.360**	-708.722**	-8.172***
	[-2.22]	[-2.25]	[-15.48]
asset	0.000	0.005	0.001***
	[0.95]	[0.97]	[8.62]
liability_ratio	-0.013	16.642***	-0.079***
	[-0.07]	[3.63]	[-10.33]
age	0.076	16.627***	0.116***
	[0.31]	[2.81]	[11.79]
_cons	18.852	-1.5e+03***	5.961***
	[1.08]	[-3.64]	[8.54]
N	5365	5370	5370
r2_a	0.062	0.065	0.085
F	1.427	7.731	125.491

t statistics in brackets, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.2.2 Does diversification affect the Operating capacity of the company

It is necessary to discuss whether the diversification of listed companies affects the operational capability of the company. Here is a discussion on whether the diversification of

listed companies affects the operating ability of the company. Here, the listed company's Accounts receivable turnover, Inventory turnover, and Current asset turnover are used as explained variables, and whether the listed company has diversified operations is used as the core explanatory variable for regression analysis, and the relationship between the two is tested through multiple regression models. Whether the assumption is established, the specific results are shown in Table 5-3.

It can be seen from the regression results that all three regressions passed the F test at the 1% level, and their F values are 1.356, 1.852 and 101.993, respectively. It shows that the setting of our model is reasonable, and the explanatory variables have explanatory power to the explained variables. From the regression coefficients of diversification, the regression coefficients of DIV in regression (2) and regression (3) are significant at the statistical level of 10%, and the regression coefficients are all negative. This shows that companies with diversified operations have a certain degree of decline in their operational capabilities. This is consistent with the theoretical expectation, that is, after the diversification of the enterprise, the difficulty of the enterprise operation may increase, and the turnover rate may decline. Finally, according to the results of the regression model, it can be seen that under the action of the control variables, the R² values all reach above 0.05. This shows that the relevant explanatory variables can even explain more than 5% of the total variance of the equation, which meets the minimum requirements for R² in statistical analysis, and has certain practical significance.

Table 5-3

(1)	(2)	(3)
operation_a	operation_b	operation_c

div	-6.970	-11.115*	-1.132***
	[-0.57]	[-1.68]	[-11.32]
asset	-0.000	0.000	0.000
	[-0.86]	[0.13]	[0.81]
liability_rati	0.091	-0.027	0.018***
o			
	[0.51]	[-0.27]	[13.85]
age	-0.076	-0.225**	0.015***
	[-0.36]	[-2.07]	[8.85]
_cons	32.700**	40.291***	2.057***
	[2.18]	[4.92]	[17.04]
N	3948	2689	4222
r2_a	0.071	0.056	0.087
F	1.356	1.852	101.993

t statistics in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.2.3 Does diversification affect the Solvency of the company

The third is to discuss whether the diversification of listed companies affects the solvency of the company. Here, the current ratio, Quick ratio, and the equity multiplier of the listed company are used as the explained variables, and whether the listed company has diversified operations as the core explanatory variable is, to conduct regression analysis,

and the hypothesis of the relationship between the two is tested by the multiple regression model. Whether the assumption is established, the specific results are shown in Table 5-4.

It can be seen from the regression results that all three regressions passed the F test at the 1% level, and their F values were 148.048, 136.899 and 1.755, respectively. It shows that the setting of the model is reasonable, and the explanatory variables have the explanatory power to the explained variables. From the regression coefficients of multiple variables, the regression coefficients of div in regression (1) and regression (2) are both significant at the 1% statistical level, and the regression coefficients are all positive.

This shows that the solvency of enterprises with diversified operations is obviously stronger. It can be understood that a diversified enterprise has more room for capital turnover, and the use cycle of business funds varies greatly, and the solvency of the enterprise also increases. This is consistent with the theoretical expectation, that is, after the diversification of the enterprise, the debt repayment risk of the enterprise tends to decrease, and the debt repayment ability increases. Finally, according to the results of the regression model, it can be seen that under the action of the control variables, the R² values all reach above 0.1. This shows that the relevant explanatory variables can even explain more than 10% of the total variance of the equation, which meets the minimum requirements for R² in statistical analysis, and has certain practical significance.

Table 5-4

	(1)	(2)	(3)
	debt_a	debt_b	debt_c
div	0.479***	0.322***	-0.227

	[2.89]	[2.87]	[-0.17]
asset	-0.000***	-0.000**	-0.000
	[-4.13]	[-1.99]	[-0.18]
liability_ratio	-0.049***	-0.037***	0.051***
	[-22.20]	[-22.33]	[2.59]
age	-0.019***	-0.010***	0.005
	[-6.67]	[-5.34]	[0.20]
_cons	6.059***	4.284***	0.539
	[30.32]	[30.73]	[0.30]
<hr/>			
N	4231	2890	5370
r2_a	0.122	0.158	0.121
F	148.048	136.899	1.755

t statistics in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.2.4 Does diversification affect the Growth capacity of the company

Fourth, it is necessary to discuss whether the diversification of listed companies affects the Growth capacity of the company. Here, Growth rate of net assets per share, Year-on-year growth rate of total sales revenue, and Year-on-year growth rate of operating profit are used as the explained variables, and whether the listed company has diversified operations as the core explanatory variable is, to conduct regression analysis, and the hypothesis of the relationship between the two is tested by the multiple regression model. Whether the assumption is established, the specific results are shown in Table 5-5.

It can be seen from the regression results that the coefficients of div in the three regressions are not significant, and whether the company is diversified has no obvious impact on its growth. In the regression, the significance of the explanatory variables is still good, and the model has passed the relevant test. It can be considered that diversification will not affect the growth of the company, and each business is still carried out relatively independently.

Table 5-5

	(1)	(2)	(3)
	grow_a	grow_b	grow_c
div	-9.435	50.559	16.784
	[-0.40]	[1.36]	[0.15]
asset	0.002***	-0.000	-0.000
	[4.20]	[-0.69]	[-0.11]
liability_ratio	-1.100***	-0.459	3.435**
	[-3.21]	[-0.80]	[2.08]
age	-0.208	-1.434**	0.809
	[-0.47]	[-2.06]	[0.38]
_cons	69.954**	89.138*	-195.000
	[2.23]	[1.77]	[-1.29]
N	5184	5315	5332

r2_a	0.004	0.001	0.000
F	6.351	1.957	1.145

t statistics in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5.3 The impact of diversification on valuation

Now, we discuss whether the diversification of listed companies affects corporate valuation. We take Price Earnings ratio and Discount as explained variables, and take the diversification of the company as the core explanatory variable for regression analysis. Multiple regression model is used to test whether the hypothesis of the relationship between the two is valid. The specific results are shown in Table 5-6.

As can be seen from the regression results, the coefficients of DIV were significantly positive in both regressions. This shows that after the diversification of enterprises, their valuation has a certain improvement, and to a certain extent, higher than the average level of the market. In the regression, the significance of explanatory variables is still good, and the model has passed the relevant tests. This proves the theoretical hypothesis 2 of this paper, that the market will give a higher valuation to diversified enterprises.

Table 5-6

	(1)	(2)
	Pe	Discount
div	28.889*	0.351***
	[1.71]	[3.77]
asset	-0.000	-0.000***

	[-1.61]	[-2.88]
liability_ratio	-0.270	-0.001
	[-1.23]	[-0.54]
age	-0.818***	-0.006***
	[-3.27]	[-4.39]
_cons	82.787***	0.968***
	[3.97]	[8.40]
<hr/>		
N	3932	3932
r2_a	0.004	0.009
F	4.476	10.283
<hr/>		
<i>t</i> statistics in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$		

5.4 The impact of diversification on valuation

Finally, we're going to talk about the impact of institutional investors on stock valuations. We also take PE and discount as explained variables respectively. We add the shareholding ratio of top five institutional investors (Top5) and the interaction between top5 and DIV into the model to further explore the influence of institutional investors' shareholding on stock valuation.

From the regression results, when the shareholding ratio of institutional investors increases, the valuation of non-diversified enterprises is relatively lower. For diversified companies, valuations have risen significantly. From the perspective of valuation, among

the Nasdaq listed companies selected by us, institutional investors are more willing to give higher valuation to those diversified enterprises.

Table 5-6

	(1)	(2)
	pe	discount
top5	-188.538***	-1.449***
	[-3.02]	[-3.32]
Top5*div	104.796**	1.228***
	[2.18]	[3.66]
asset	-21.885***	-0.133***
	[-6.35]	[-5.52]
liability_ratio	-0.028	0.002
	[-0.14]	[1.08]
age	-0.769***	-0.007***
	[-3.53]	[-4.60]
_cons	285.269***	2.312***
	[9.39]	[10.91]
<i>N</i>	3531	3531
r2_a	0.017	0.017

F

13.376

13.267

t statistics in brackets * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

6. Conclusion

In recent years, the relationship between diversification and enterprise value has gradually become a hot topic in the academic and business circles. There is no consistent answer as to whether enterprise diversification can improve enterprise performance and valuation level. On the basis of reviewing the existing research, this paper puts forward the research hypothesis that diversification may reduce and improve the business performance of enterprises. However, for technology enterprises, diversification means relatively lower risks on the one hand, and potential synergies in related businesses on the other hand. As a result, the market is likely to give it a higher valuation than a single operation. On this basis, this dissertation uses empirical research method to verify the research hypothesis with the data of Nasdaq Select index related listed companies from 2015 to 2019. The results show:

(1) Diversification reduces the profitability and operation capacity of the company to a certain extent. This is consistent with the research ideas of principal-agent theory. However, the solvency of diversified enterprises has been improved to a certain extent, which is mainly due to the differences in the use cycle of various business funds after decentralized operation, leading to the reduction of corporate debt pressure. In addition, diversification does not affect the growth of enterprises.

(2) The relationship between diversification and company valuation. Our theory assumes that H2 believes that diversification actually enterprise risks by diversifying investment. As a result, investors may value companies with diversified investments at a

higher price. Our empirical results also confirm this research hypothesis, that is, diversification is significantly positive correlated with Price Earnings ratio and PE discount.

(3) When we add the shareholding situation of institutional investors into the model, we find that the existence of institutional investors leads to an increase in the valuation of diversified enterprises.

Reference

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