

Research on Relationship Between Governance Structure and Corporate Performance of Chinese Technology Companies

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Abstract: In the post-pandemic age of 2023, the economy is in recovery. Despite the distinctive qualities of technology firms, such as quick development and high levels of innovation, they face problems such as economic downturns and funding issues. As a result, the corporate governance structure is critical to guaranteeing the firms' long-term viability. The purpose of this article is to examine 252 publicly traded technology companies and investigate the link between corporate financial performance and corporate governance arrangements. This article used Ordinary Least Squares (OLS) analysis to look at the link between board independence, Chief Executive Officer (CEO) duality, ownership concentration, and return on equity (ROE). The regression findings indicate a negative association between ROE and the proportion of independent directors. However, there is no substantial association between the duality of ROE and the CEO, and ROE has a U-shaped relationship with ownership concentration. The study's findings imply that corporate executives and regulators should adopt an effective monitoring mechanism to ensure the impartiality and reliability of independent directors' oversight. To ensure strong financial performance, organizations should maintain appropriate levels of independent director percentages and stock concentration.

Keywords: OLS Regression, Corporate Governance Structure, Corporate Performance.

1. Introduction

In recent years, China's technology industry has shown a high degree of rapid development. On the other hand, big data, new energy, and artificial intelligence drive the industry's intelligence and innovation, providing technology-based enterprises with significant advantages and performance improvements. On the other hand, with the effects of increased competition in the industry and the special economic recovery period after the COVID-19 pandemic, technology companies are also facing problems such as slowdowns in development and financing difficulties. Therefore, against this realistic background, exploring the governance structure of technology companies is crucial to their healthy development.

Academics have increasingly studied corporate governance issues over the past few decades. High-profile scandals and the growing influence of institutional investors have prompted companies to focus more attention on their governance practices. Existing research has primarily focused on the

structure of boards, shareholding structures, and environmental, social, and governance factors. They have also explored the relationship between corporate performance and these governance variables, concluding with valuable findings. Gupta et al. suggest that larger boards can enhance environmental, governance, and society (ESG) performance, thereby improving corporate performance [1]. However, a number of high-impact governance issues have surfaced in China's tech sector, including allegations of financial misconduct, concerns about the independence of boards, the impact of controlling shareholders, and allegations of financial misconduct by large companies. This exposes the lack of independence of boards, internal control deficiencies, and other governance weaknesses in the technology industry.

What is more, when examining corporate governance issues from theoretical perspectives, it can refer to stakeholder theory and agency theory. The former argues that firms need to balance the relationship between shareholders, employees, customers, and many other relevant stakeholders [2]. The latter focuses on the problem of agency between managers and business owners [3]. The business characteristics of the technology industry, along with its rapid growth, often lead to increased conflicts among related stakeholders and agency problems [3].

As corporate governance issues are increasingly receiving more scrutiny in the field of listed companies' corporate governance, abundant literature can be found. Research can test the characteristics of a listed company's board of directors and corporate performance. Regression analysis using OLS and t tests can explore financial performance and governance structure variables, providing valuable insights into the relationship between corporate performance and the independence of the board of directors [4]. However, some studies have reached a different conclusion [4]. The relationship between performance and the CEO reflects this phenomenon. However, these studies have focused more on listed companies across the whole market than specializing in the technology sector. Furthermore, the findings on crucial governance variables like CEO duality, ownership concentration, and board independence exhibit significant divergences. By exploring the governance structure of technology companies, this gap can be filled. Exploring technology companies' corporate governance issues can help ensure the healthy development of this emerging industry, as well as provide effective insights into corporate governance reforms in other industries.

This paper's research method is quantitative analysis, and its research object is China's listed technology companies. Firstly, the background of the study as well as the relevant theories are sorted out. This study will review the literature and concepts in the field of corporate governance and test three related research hypotheses. After outlining the data sources, research methodology, and model design of this study, it can be tested the validity of the hypothesis, discuss the implications of the study results, and unveil the analysis results. Finally, the results of this study are summarized, and future research directions can be proposed.

2. Literature Review

2.1. Definition

Company governance is responsible for overseeing and regulating process systems, procedures, and company norms [5]. Corporate governance encompasses the controller and the system for ensuring the company's responsibility, while other connections exist between other stakeholders, the board of directors, and the company's management.

Key elements of corporate governance include ownership arrangements, control and motivation mechanisms that align with the interests of managers and other stakeholders, and the composition of the board of directors.

2.2. Important Results

The proportion of independent directors can serve as a governance variable when the proxy variable for board independence is quantifiable. Independent directors, who have no direct or indirect commercial ties with management, are in charge of managing shareholders who own a small percentage of the company [6]. However, new research indicates that a large share of independent directors may have a detrimental influence on the company's performance. Tran used fixed-effects modelling to study 545 big Asian enterprises, and the findings indicate that independent directors have no statistically significant direct impact on company profitability [7]. In 2024, researchers examined panel data from 152 Pakistani non-financial listed corporations. The authors found that in emerging economies, independent directors have tighter contact with corporate management, reducing the efficacy of their monitoring, and hence the percentage of independent directors has a negative impact on financial performance [8]. A 2022 panel data analysis on the Bangladesh Dhaka Stock Exchange discovered that having additional independent directors did not significantly boost corporate profitability and may even have a negative impact owing to inefficient monitoring [9]. The study findings presented above called into question the conventional premise that board independence may typically increase company governance and performance. Given the specific conditions of technology businesses, the complexity of this industry is likely to require a greater degree of specialized knowledge and faster execution of strategy, skills that independent directors may lack. In particular, the close relationship between independent directors and management in emerging markets reduces the efficacy and neutrality of their supervision.

This study examines CEO duality as a governance variable, which occurs when the CEO also serves as the chairman of the board. Opponents of CEO duality claim that it increases agency costs and undermines board scrutiny by allowing the CEO to easily manipulate the board, compromising the board's capacity to defend shareholders' interests [10]. Several studies have investigated and debated this concept, with many empirical findings indicating that CEO double-hatting can negatively impact business profitability. Debnath et al. conducted a meta-analysis, which found that organizations with CEO duality typically have poorer financial performance due to excessive control, over-centralization, insufficient supervision, and agency difficulties. [11]. Duru and others hypothesized that a dynamic negative link exists between CEO and business performance, resulting in an adjustment of board independence [12]. Additionally, research analyzed data from 200 organizations from 2016 to 2020, identified management theory, country theory, and agency theory, and determined how CEO duality affects company performance. [13]. In China, where the legal and regulatory environment is largely weak, CEOs can operate in their own self-interest without concern for the board of directors' scrutiny. According to the argument presented above, there is a negative association between business earnings and the CEO.

The shareholding degree of a few major shareholders in a company's shares can represent ownership concentration, and this study uses the shareholding proportion of the largest shareholder to calculate the index of ownership concentration [14]. From a theoretical perspective, ownership concentration can be beneficial or detrimental to the performance of a firm. First, if the major shareholders oversee management and take the best actions, the company will succeed more. Nevertheless, it is important to note that large shareholders can also seize value from small shareholders, where the investors' rights are not well protected. Machek and Kubek analyzed companies listed on the Prague Stock Exchange of the Czech Republic from 2011 to 2015, exploring the nonlinear relationship between company performance and ownership concentration [15]. The research shows that there is an inverted U-shaped relationship between the performance of a business and the concentration of ownership. This means that there is a best level of equity concentration that causes the performance of the business to go down [15]. The 2022 China Panel Data study analyzes

the relationship between corporate performance and equity characteristics of A-share listed companies from 2007 to 2020. The researchers propose that the degree of ownership concentration and financial performance reflect the significance of the inverse U-shaped relationship. Appropriate equity concentration increases firm profitability, while excessive concentration jeopardizes firm performance [16]. The above literature conclusions mean that a moderate shareholding ratio can positively improve firm performance, whereas a high shareholding ratio may increase the incidence of large shareholders' misconduct and harm firms.

2.3. Hypothesis Development

Previous studies conclude that the variables of corporate performance and corporate governance have solid foundations. The characteristics of technology companies and the non-objective nature of emerging markets may compromise the significance and effectiveness of independent directors' oversight. This leads to regulatory ineffectiveness and a negative correlation with a company's level of profitability. Second, the chief executive and chairman overly concentrate power, thereby weakening the board's supervisory role and negatively impacting the company's financial performance. This disadvantage could be particularly problematic in China due to the country's weak legal and institutional framework. Third, moderate equity concentration may encourage large shareholders to engage in corporate governance and improve performance, whereas high ownership concentration may be detrimental to the firm's interests.

Thus, the following hypotheses are proposed:

H1. Board independence is negatively correlated with technology firm profitability.

H2. CEO duality negatively affects the profitability of technology firms.

H3. There is an inverse U-shaped relationship between technology companies' profitability and ownership concentration.

It can be concluded that Chinese technology companies are the sample of this paper, and the main purpose of testing these hypotheses is to contribute to the existing literature that can be made on the relation between the performance of the company and the governance of the corporation. Investors, policymakers, and managers, with a greater interest in supporting the sustainable growth of China's technology sector, have reinforced corporate governance.

3. Methodology

3.1. Research Design

To enable the data collected in this study to be analyzed, the model could be estimated using a multiple linear regression model, and the three hypotheses in the literature review could be tested. The study uses multiple linear regression as the main statistical method to test for linear correlation between independent variables and one dependent variable [17]. ROE, the dependent variance, measures corporate financial performance, while ownership concentration, CEO duality, and board independence, the three dimensions of corporate governance structure, are independent variables. Research on firm performance and corporate governance encourages the use of multiple linear regression models. Many researchers have adopted OLS regression analysis to analyze or test the hypotheses relating to the governance structure variables and financial performance [18–20]. This study reveals direct relationships between company performance, ownership concentration, and board independence.

Furthermore, multiple regression analysis allows for the inclusion of control variables that explain other factors influencing corporate financial performance. The literature frequently employs several control variables in this study, including net profit margin, asset-liability ratio, earnings per share,

and gross profit margin [21–23]. How do the governance variables that identify the model affect ROE? Here's the multiple linear regression model (Formula 1):

$$ROE = \beta_0 + \beta_1 INDEP + \beta_2 DUAL + \beta_3 TOP1 + \beta_4 TOP1^2 + \sum_{i=1}^n \beta_{4+i} Control_i + \varepsilon_i \quad (1)$$

The terms ROE, Independent Director Ratio (INDEP), and DUAL refer to financial profitability, the proportion of independent directors, and binary variables, respectively. For example, 1 is when the CEO is also chairman; otherwise, it is 0; TOP1 and TOP1² refer to the ownership ratio of the biggest principal shareholder and the square of the value, which can be harnessed to analyze the nonlinear relationship. The series of control variables includes gross margin (GPM), earnings per share (EPS), debt-to-asset ratio (DAR), total asset turnover (TAT), and net profit margin (NPM). The constants and random error terms can be expressed in terms of β_0 and ε_i .

3.2. Data Collection & Analysis

The main study subjects in this work are 252 Chinese listed technology businesses, and the primary data sources are the Accounting Study (CSMAR), the WIND database, and the Chinese securities market, with a temporal horizon of the end of 2023. This time period was selected to enable the use of the most recent data and to represent the efficiency of tech company governance during the key year of China's post-pandemic economic recovery.

Previous research has extensively used ROE as a representative indication of a firm's financial success. The corporate governance structure variables selected are based on the three hypotheses proposed in the preceding section. These are the INDEP, if the CEO also serves as chairman (DUAL), and the largest shareholder's ownership proportion (TOP1). Continuous variables can be used to reflect the largest shareholder's ownership ratio as well as the percentage of independent directors. The proportion of independent directors is calculated by dividing the number of independent directors by the total number of directors, and the shareholding ratio of the largest shareholder is represented by the ratio of the number of shares held by the largest shareholder to the total number of shares in the company. DUAL, a categorical variable, is given the values 1 and 0. To further limit the possible influence of business characteristics, this paper may include a number of control variables, such as net profit margin, total asset turnover, leverage, and profits per share.

Statistical Product and Service Solutions (SPSS) generated all of the data shown above and the accompanying econometric tests. Before doing the regression analysis, the study uses descriptive statistics to assess the relationships between the variables. The three assumptions provided above can then drive the development of the multiple linear regression model.

4. Results

4.1. Descriptive Analysis

All the descriptive data can be seen in Table 1, the ROE, standard deviation, minimum ROE, and maximum ROE of the sample companies are 5.20%, 10.90%, -31.40%, and 47.70%, respectively, indicating that the sample companies maintain a medium level of overall profitability, although there are significant differences between them.

The average proportion of independent directors is 39.30%, and listed companies can meet the requirement if their proportion is one-third lower than that of independent directors. The lowest value was 33.33 percent, and the highest value was 80 percent, indicating that most of the companies complied with the relevant regulations, but the proportion of independent directors in individual companies was significantly higher than the regulatory requirement. This difference reflects the differences in understanding and practice of corporate governance structure among companies.

Because of the dual role of the CEO, 48% of companies have a CEO who is not the chairman of the board, but 52% of the companies' CEOs are also the chairpersons of the board of directors. This

result suggests that there is a rough balance between centralization and decentralization of CEO power in the sample.

The average, lowest, and highest values of the shareholding ratio of major shareholders are 29.10%, 4.00%, and 71.90%, respectively. The ownership structure of the sample companies reflects concentration, yet there are significant differences between different companies.

The descriptive statistics suggest the average gearing ratio of the sample companies is 28.70%, which is at a reasonable level. The sample companies need to improve their overall asset utilization efficiency, as evidenced by the average total asset turnover ratio of 0.46. The average net sales margin was 3.30%, indicating that overall profitability was medium, but the minimum value was -551% and the maximum value was 53.55%, highlighting the huge difference in profitability among companies. The average gross profit margin is 40.70%, which is at a good level, but the differences in cost control and pricing ability among companies are very obvious. The average earnings per share of RMB 0.93 suggests that the overall profitability of the companies is not bad, but the range from RMB -7.95 to RMB 15.60 confirms the huge span of profitability of the companies.

Table 1: Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
ROE	252	-0.314	0.477	0.052	0.109
INDEP	252	0.333	0.800	0.393	0.074
DUAL	252	0	1	0.52	0.501
TOP1	252	0.040	0.719	0.291	0.135
DAR	252	0.012	1.223	0.287	0.202
TAT	252	0.034	1.772	0.462	0.258
NPM	252	-5.510	0.536	0.033	0.411
GPM	252	-0.643	0.971	0.407	0.223
EPS	252	-7.951	15.601	0.9289	2.318

4.2. Correlation Analysis

In the correlation analysis (Table 2), a weak positive correlation exists in ROE and the proportion of independent directors ($r=0.128$, $p<0.05$), but the correlation coefficient is small. The correlation between dual CEO positions and ROE is not significant ($r=-0.032$, $p>0.05$). The connection between majority shareholders' ownership and ROE is not significant ($r=0.069$, $p>0.05$).

Table 2: Correlations

		ROE	INDEP	DUAL	TOP1
ROE	Pearson	1	0.128*	-0.032	0.069
	Sig.		.042	.608	.275
	N	252	252	252	252
INDEP	Pearson	0.128*	1	-0.008	0.003
	Sig.	.042		.895	.964
	N	252	252	252	252
DUAL	Pearson	-0.032	-0.008	1	-0.037
	Sig.	.608	.895		.556
	N	252	252	252	252
TOP1	Pearson	0.069	0.003	-0.037.	1
	Sig.	.275	.964	.556	

Table 2: (continued).

N	252	252	252	252
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*. Significant correlation at the .05 level (bilateral)

4.3. The Multiple Linear Regression's Analysis

In light of the results of the model summary table, it can be seen that there is a significant divergence in the explanation between Model 1 and Model 2. There are only four independent variables in Model 1: the proportion of independent directors, the number of dual positions held by CEOs, the proportion of major shareholders, and a quadratic term. The values before and after the R-square adjustment are 0.036 and 0.020, respectively. This means that the independent variables can only explain 3.6% of the variation in ROE, which means that Model 1 is not very good at explaining things. Upon adding a series of control variables to Model 2, including total asset turnover, debt ratio, gross margin, and net sales margin, the R2 significantly increases to 0.629, and the adjusted R2 reaches 0.615, demonstrating the effective enhancement of the illustrative power of this model (Table 3 to 4).

Table 3: Enter/Remove the Variable ^a

Model	The Variable entered	The removed Variable	Method
1	INDEP, DUAL, TOP1, TOP ² ^b	-	Input
2	INDEP, DUAL, TOP1, TOP ² , DAR, TAT, NPM, GPM, EPS ^b	-	Input

Note: a. Dependent variable: ROE. b. All of the requested variables have been entered.

Table 4: Model Summary

Model	R	R ²	Adjust the R ²	The error of the standard estimates
1	.189 ^a	.036	.020	.1076203515
2	.793 ^b	.629	.615	.0674756111

Note: a. Predictor variables: (constant), INDEP, DUAL, TOP1, TOP²

b. Predictor variables: (constant), INDEP, DUAL, TOP1, TOP², DAR, TAT, NPM, GPM, EPS

In addition, from the ANOVA results (Table 5), the F-statistic of model 1 is 2.295, corresponding to a 0.060 sig., which not reaches the 0.05 level of significance, indicating that the poor overall fitting effect is represented by Model 1. On the other hand, the F-statistic of model 2 is as high as 45.521, and the p-value is far less than 0.001, indicating the model 2 has more statistically significance, and the model's fitting effect is greatly improved after the introduction of control variables.

Table 5: ANOVA ^a.

Model		Quadratic Sum	Degree Freedom	of	Mean Square	F	Sig.
1	Regression	.106	4		.027	2.295	.060 ^b
	Residual	2.861	247		.012		
	Total	2.967	251				
2	Regression	1.865	9		.207	45.521	.000 ^c
	Residual	1.102	242		.005		
	Total	2.967	251				

Note: a. Dependent Variable: ROE.

b. Predictor variables: (constant), INDEP, DUAL, TOP1, TOP²

c. Predictor variables: (constant), INDEP, DUAL, TOP1, TOP², DAR, TAT, NPM, GPM, EPS

Model 1 contains only independent variables, while the Model 2 adds control variables to the independent variables. With the results of Model 2 as the main basis, the equation can be embodied as follows:

$$ROE = -0.069 - 0.128 \times INDEP - 0.012 \times DUAL + 0.334 \times TOP1 - 0.399 \times TOP1^2 + 0.029 \times DAR + 0.106 \times TAT + 0.072 \times NPM + 0.100 \times GPM + 0.022 \times EPS + \varepsilon_i \quad (2)$$

As can be seen in Table 6, the coefficient of the independent directors' proportion is -0.128, with a significant negative displayed at the significance level of 5% ($p = 0.040$). The inverse of Model 1 to this result indicates that other financial factors are controlled for; the proportion of independent directors may not effectively perform a supervisory role, but instead negatively impact the company's performance, thereby supporting Hypothesis 1.

The data does not support Hypothesis 2, as the coefficient of the CEO's dual position is -0.012, but it is not significant ($p = 0.164$), suggesting that the CEO's dual role as chairman significantly affects ROE.

The beta of the majority shareholder's ownership is 0.334, and the beta of the secondary term is -0.399, reaching the 0.05 significance level. Corporate performance and ownership structure reflect the nonlinear relationship; there is an optimal level of shareholding concentration, and too high or too low a concentration will lead to a decline in performance, supporting Hypothesis 3.

Among the control variables, the betas of TAT, NPM, GPM, and EPS all arrive at the 0.01 level, indicating that the efficiency of asset utilization, profitability, and shareholders' returns are important factors impacting the company's performance. The gearing ratio's beta value is positive but not significant, suggesting that debt level may not directly affect ROE.

Overall, the regression results partially support the hypotheses proposed in this paper. Upon taking into account other financial factors, this paper finds that the independence of directors has a negative relationship with ROE, dual CEO positions do not significantly impact ROE, and the return on equity and ownership concentration exhibit a U-shaped relationship.

Table 6: Coefficient.

		Non-standardized coefficients		Standardized Coefficients	t	Sig.
Model		B	The Error of Standard	Beta		
1	(constant)	-.089	.050		-1.791	.075
	INDEP	.190	.092	.129	2.066	.040
	DUAL	-.008	.014	-.036	-.570	.569
	TOP1	.438	.210	.545	2.084	.038
	TOP1^2	-.559	.298	-.492	-1.880	.061
2	(constant)	-.069	.034		-2.024	.044
	INDEP	-.128	.062	-.087	-2.066	.040
	DUAL	-.012	.009	-.056	-1.397	.164
	TOP1	.334	.132	.416	2.525	.012
	TOP1^2	-.399	.187	-.351	-2.129	.034
	DAR	.029	.023	.054	1.292	.198
	TAT	.106	.019	.252	5.613	.000
	NPM	.072	.012	.273	6.012	.000
	GPM	.100	.021	.206	4.735	.000
	EPS	.022	.002	.471	9.752	.000

Note: Dependent variable: ROE.

5. Discussion

In summary, after controlling for other financial factors, this study draws three important conclusions. First, a significant negative correlation exists between the return on equity and the independent directors' proportion, indicating that independent directors are unable to play an effective monitoring role in the technology industry but rather harm the company's performance, which supports Hypothesis 1 of this paper. This is consistent with the findings of research on independent directors in emerging markets in recent years [8]. Secondly, the analysis do not support Hypothesis 2, suggesting that CEOs who also chair boards of directors do not significantly affect ROE. This may be due to the lagged and cumulative effect of CEO duality, which requires longer data to observe. ROE and ownership concentration exhibit an inverse U-shaped relationship, while firm performance and ownership structure confirm the nonlinear relationship [15, 16]. Thus, there exists an optimal level of shareholding concentration, and both too high and too low concentrations are detrimental to the firm's profitability, which supports Hypothesis 3.

Based on the aforementioned findings, this study proposes the following recommendations for corporate governance practices in Chinese technology companies: Firstly, it is crucial for the study to meticulously examine the proportion of independent directors. This is because an increase in the proportion of independent directors does not necessarily fulfil the supervisory role but rather impacts the efficiency of the company's decision-making process. It is crucial to prioritize the independence and professionalism of these directors. Second, it should be open to the idea that the CEO's concurrent chairmanship may not exacerbate the agency problem in China's institutional context but should be considered in light of the company's specific situation and the independence of the board of directors. Thirdly, companies should maintain an appropriate degree of shareholding concentration, as too much dispersed shareholding may lead to insufficient incentives for the majority shareholders to supervise. Excessive concentration will harm the interests of minority shareholders, necessitating a balance between promoting active governance by the majority shareholders and preventing the transfer of benefits. Additionally, policymakers should enhance the A-share market's regulatory system to guarantee the efficacy of external regulation and to effectively and efficiently carry out the regulatory responsibilities of independent directors.

6. Conclusion

This paper focuses on Chinese technology companies as its research objects, explaining the relationship between corporate financial performance and the structure of corporate governance in the technology industry, with the post-epidemic economic recovery period of 2023 serving as the epochal backdrop. This paper adopts agency theory and stakeholder theory as its theoretical foundation, and proposes three hypotheses based on past literature. The final linear regression analysis through SPSS leads to three conclusions: First, in China, an emerging market as well as the technology industry, a negative correlation exists between corporate profitability and the proportion of independent directors, which validates this paper's Hypothesis 1. This may be due to the fact that an overly close relationship between independent directors and management in an emerging market leads to ineffectiveness and independence of supervision. In addition, the complexity and rapid development of the technology industry require directors to have more specialized knowledge, which may be lacking in independent directors. Secondly, CEO duality does not significantly affect corporate financial performance. This result contradicts Hypothesis 2 of this paper, possibly because the effect of CEO duality has a latency and requires a longer time span to manifest itself, whereas this study focuses on the time cross-section of 2023. Thirdly, the concentration of ownership shows a non-linear relationship, i.e., an inverted U-shape, with a firm profitability level, validating this paper's Hypothesis 3. This result, which is in line with expectations, highlights the fact that moderate equity

concentration facilitates the participation of large shareholders in the firm's affairs while at the same time protecting the interests of small shareholders, and that both excessively high and excessively low levels of concentration can adversely affect firm performance.

This research, which fills a gap in existing research, focuses on the governance of China's science and technology industry. The inverse U-shaped relationship exists between the negative effects of ownership concentration, independent directors, and corporate performance. The study's results provide a reference for policymakers to improve the governance policies of Chinese technology companies and can help corporate managers optimize corporate governance structures and improve corporate performance. However, this study's sample, limited to cross-sectional data at the end of 2023, fails to observe the long-term trend. Future research can adopt the longitudinal method and observe the long-term impact of corporate governance structure on performance. How the governance of the company is affected by the effectiveness of technology industry characteristics can be discussed.

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