

Dual-class Stock Structure and Corporate Innovation

— Evidence from Listed Companies on the Science and Technology Innovation Board

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Abstract: The dual-class stock structure is a common corporate governance model for science and technology enterprises. We explore the influence of the dual-class stock structure on the innovative behavior of companies listed on China's Science and Technology Innovation Board (STAR) and provide theoretical and practical insights for policymakers and enterprise managers. In our empirical analysis, we use a hand-collected sample to demonstrate that firms with dual-class stock structures exhibit a higher level of innovation, offering valuable insights into its practical effects and international practices. Furthermore, we find that only eight firms have adopted the dual-class stock structure, indicating that it is underutilized in China's capital market.

Keywords: Dual-class stock structure, Corporate innovation, Sci-tech Innovation Board.

1. Introduction

Among new technology enterprises, corporate governance exhibits some distinct characteristics. A notable example is Snap, a social media and technology company that adopted a triple-class stock structure in its initial public offering (IPO) in 2017. Snap's Class A shares lack voting rights, while the founders and early investors retain absolute control of the company by holding Class B and Class C shares. The triple-class stock structure is fundamentally similar to the dual-class structure, which has been developed in modern society to meet the needs of various development stages.

The dual-class stock structure, also known as the AB share structure, refers to stock classes with different voting rights within a company's shareholding structure [1]. Typically, Class A shares carry fewer voting rights, while Class B shares hold greater voting rights, though there is no significant difference in income distribution. This structure allows the company's founding team and core management to leverage the capital market while maintaining control of the company's decision-making, despite a lower shareholding ratio. This control enables long-term planning and strategic implementation during the innovation process.

Although the dual-class stock structure was initially applied in foreign countries, several listed companies on China's STAR have now adopted the AB share structure. Jingdong, a Chinese online shopping platform in the B2C market, uses the AB share structure in the stock market. Due to the high voting rights associated with Class B shares, the founder (Liu Qiangdong) maintains control of

the company while holding relatively few shares but owning nearly 80% of the voting rights. Additionally, as the “experimental field” of China’s capital market, the Sci-Tech Board carries the important mission of promoting scientific and technological innovation and supporting the development of emerging industries. In this context, the introduction of the dual-class stock structure has become a key feature of the Sci-Tech Board, attracting many technology enterprises to be listed.

The contributions of this paper are reflected in three main aspects. First, it examines the current dual-class stock companies listed on China’s Sci-Tech Innovation Board. It shows that, in China’s capital market, the usage frequency of the dual-class stock structure is quite low, and the existing dual-class stock companies adopt only a simplified version of the structure rather than utilizing its core principles. Second, this paper uses actual data from the Chinese Sci-Tech Board, offering a valuable supplement to previous empirical research. It also provides a more in-depth discussion of the dual-class stock structure from an international practice perspective. Third, this paper demonstrates the advantages of the dual-class stock system in terms of equity. By influencing voting rights and control rights, companies can make decisions without being swayed by financial investors, which has a profound and significant impact on their long-term development.

This paper aims to explore the influence of the dual-class stock structure on the innovation behavior of listed companies on the Sci-Tech Board, while further examining the applicability and development prospects of the structure in China’s capital market. It is hoped that this study will provide theoretical support and practical reference for policymakers and enterprise managers and contribute to the healthy development of China’s capital market and the growth of innovative enterprises.

2. Literature Review

2.1. Theoretical Basis and Governance Influence

Current research on the dual-class stock structure primarily focuses on its application, economic consequences, and agency costs. Regarding its application, previous foreign literature has shown that the dual-class structure occupies a unique position in corporate governance in the United States [2]. Shmuel and Beni further explored the impact of dual equity mergers on the voting value of majority shareholders, and Douglas et al. revealed the key role of voting power in enhancing corporate governance [3, 4]. In China, research has shown that the corporate governance level of Sci-Tech Board-listed enterprises has a significant impact on their financing [5]. In terms of economic consequences, in the era of the digital economy, corporate management reform drives enterprise innovation, and the design of a fair market system and strict review processes are essential for effective governance [6, 7]. Valentin & Prem demonstrated that the dual-class stock structure generally promotes innovation and performance in enterprises [8]. Moreover, companies should follow strict regulatory policies when issuing shares with different voting rights in an IPO [9]. However, this structure may also exacerbate agency problems, necessitating increased oversight of managerial behavior, and its governance efficiency requires effective institutional safeguards [10, 11].

2.2. Review of the Dual-class Stock Structure and Corporate Innovation

The dual-class stock structure has a significant impact on enterprise innovation. Studies have shown that this structure encourages stable investment in human capital and improves the innovation capacity of enterprises [12]. In the United States, the dual equity structure significantly enhances innovation, especially in companies facing a high threat of external takeover [13]. However, this structure also poses potential problems. For example, the dual-class structure can exacerbate excessive investment behavior, which may be alleviated by mechanisms such as the introduction of sunset clauses [14]. Zhou et al. further noted that although the structure plays a positive role in

promoting innovation, its actual effect in the Chinese market still needs to be analyzed in the context of the specific institutional environment [15].

H1: The dual-class stock structure has a positive effect on promoting corporate innovation.

Upon review, it becomes evident that the applicability of the dual-class share structure in the Chinese market requires further study. Thus, this paper proposes multiple shareholding structure policy suggestions adapted to China's realities, an important step in addressing the current research gap. This paper also incorporates real-world cases from Sci-Tech Innovation Board enterprises, providing both theoretical support and an empirical basis for constructing a dual-class stock structure system for listed companies on China's Sci-Tech Innovation Board.

Table 1: Summary of 8 Dual-class Stock Structure Listed Companies on the Sci-Tech Board.

	Corporate Name	Listing Time	Dual-class Stock Structure Design	Relevant Ratios of Stock Ownership	Sunset Terms
1	UCloud	20/01/2020	According to the special voting rights arrangement, the Class A shares held by Ji Xinhua, Mo Xianfeng, and Hua Kun, the joint actual controllers of the issuer, have 5 times the voting rights of Class B shares held by other shareholders.	I. Largest shareholder's holding ratio: 13.96% II. Controlling shareholders' holding ratio: 26.83% III. Actual controller's holding ratio: 26.83% IV. Actual controller's control ratio: 64.71%	Not involved
2	Segway-Ninebot	29/10/2020	Holders of Class A common shares have 1 vote per share, while holders of Class B shares have 5 votes per share. The company has a total share capital of 70,409,167 shares, consisting of 52,254,510 Class A shares and 18,154,657 Class B shares.	I. Largest shareholder's holding ratio: 30.88% II. Actual controller's holding ratio: 82.21% III. Actual controller's control ratio: 68.02%	Not involved
3	Seacross Pharma	26/10/2021	The issuer's shares are divided into special voting shares and ordinary shares. For special matters stipulated in the articles of association, each special voting share has five votes, while each ordinary share has one vote.	I. Largest shareholder's holding ratio: 36.80% II. Controlling shareholders' holding ratio: 36.80% III. Actual controller's holding ratio: 36.80% IV. Actual controller's control ratio: 66.63%	Not involved
4	Jing-Jin Electric Technologies	27/10/2021	Under the special voting rights arrangement, the 69,677,522 shares held by the controlling shareholder, Baixiang New Energy, are special voting shares. Each of Baixiang New Energy's shares has 10 times the voting rights of shares held by other shareholders (including those offered to the public).	I. Largest shareholder's holding ratio: 15.74% II. Controlling shareholders' holding ratio: 15.74% III. Actual controller's holding ratio: 20.79% IV. Actual controller's control ratio: 67.47%	Not involved

Table 1: (continued).

5	ACM Research	18/11/2021	The company has Class A and Class B common stock. The total number of Class A shares is 16,182,151, each with 1 vote, and the total number of Class B shares is 1,862,608, each with 20 votes.	I. Largest shareholder's holding ratio: 82.50% II. Controlling shareholders' holding ratio: 82.50% III. Actual controller's holding ratio: 15.15% IV. Actual controller's control ratio: 35.67%	Not involved
6	SmartSens Technology	20/05/2022	Under the special voting rights arrangement, the issuer's share capital consists of Class A shares with special voting rights and Class B shares. Each Class A share held by Xu Chen, the controlling shareholder and actual controller, has 5 times the voting rights of each Class B share held by other shareholders.	I. Largest shareholder's holding ratio: 15.23% II. Controlling shareholders' holding ratio: 15.23% III. Actual controller's holding ratio: 15.23% IV. Actual controller's control ratio: 51.46%	Not involved
7	Cloudwalk	27/05/2022	Under the special voting rights arrangement, the 146,505,343 shares held by the controlling shareholder, Changzhou Yuncong, are Class A shares, and the shares held by other shareholders (including those offered to the public) are Class B shares. Each Class A share has 6 votes, while each Class B share has 1 vote.	I. Largest shareholder's holding ratio: 24.42% II. Controlling shareholders' holding ratio: 23.32% III. Actual controller's holding ratio: 23.32% IV. Actual controller's control ratio: 64.60%	Not involved
8	Orbbec Inc.	07/07/2022	Under the special voting rights arrangement, before the issue, 82,800,000 shares held by Huang Yuanhao, the controlling shareholder and actual controller of the company, are Class A shares, while the remaining shares are Class B shares. Each special voting share has five votes, while each ordinary share has one vote.	I. Largest shareholder's holding ratio: 39.70% II. Controlling shareholders' holding ratio: 39.70% III. Actual controller's holding ratio: 39.70% IV. Actual controller's control ratio: 68.60%	Not involved

In general, the number of listed companies using the dual-class stock structure on the Sci-Tech Board is relatively small. Among these companies, the dual-class structure is clearly defined to ensure a certain level of control. For example, UCloud has enabled the actual controller to achieve a control ratio of 64.71% through a special voting rights arrangement. It is also worth noting that although the sunset clause is commonly discussed in academic papers, none of the eight companies mentioned currently employ it. However, more Chinese companies may gradually adopt the sunset clause to better ensure the legal and contractual validity within a specified period.

3. Data and Research Model

3.1. Description of Sample Data

This study selected listed companies from China's STAR as the research sample, providing a theoretical basis for examining the relationship between dual-class stock structures and enterprise innovation. The dual-class stock structure data were obtained from the prospectuses of listed companies on the Sci-Tech Board, and the financial data were primarily sourced from the China Stock Market Accounting Research (CSMAR) Database. The sample period covers 2019 to 2023, with 2019 chosen as the starting point since the Sci-Tech Board was launched in July of that year. This paper excluded samples with missing data, insolvency, delisting risks, and companies from the financial industry, resulting in 865 annual observations. Additionally, to mitigate the impact of outliers on the results, Winsorization was applied at the 1% and 99% levels.

3.2. Key Variables Description

Using Stata, Table 2 presents the key variables and their definitions, along with descriptive statistics. The primary explanatory variable in this study is Dual, which indicates whether a company listed on the Sci-Tech Innovation Board has adopted a dual-class stock structure. If the company has a dual-class stock structure, the value is 1; otherwise, it is 0. As shown in Table 2, the mean value of Dual is 0.009, with a standard deviation of 0.096, illustrating that only a small proportion of listed companies on the Sci-Tech Board (1.4% on average) have adopted this structure. The dependent variable is RD, representing total R&D investment. The mean R&D investment is 203.43 million, with a standard deviation of 442.764, indicating significant variation among different enterprises. This study also controls for various firm-level variables, including corporate size (Size), asset-liability ratio (Leverage), return on assets (ROA), tangible assets ratio (Tang_assets), board size (Board_size), and board independence (Board_ind), all of which are frequently used in the existing literature [14].

Table 2: Descriptive Statistics.

		(1)	(2)	(3)	(4)	(5)
Variables	Definition of Variable	N	Mean	Sd	Min	Max
Size (log)	Log of Total Assets	865	21.732	0.853	20.274	24.701
Leverage (%)	Asset-liability Ratio	865	26.734	16.874	3.880	71.410
RD(log)	Log of R&D Investment Amount	865	18.447	1.002	16.591	21.375
RD(million)	R&D Investment Amount (in millions)	865	203.430	442.764	7.926	6,898.656
ROA(%)	Return on Assets	865	6.357	4.836	0.231	31.628
Tang_assets(%)	Proportion of Tangible Assets	865	96.250	3.881	77.989	99.961
Board_size(log)	Log of Board Size	865	2.185	0.165	1.792	2.773
Board_ind(%)	Board Independence	865	38.056	4.776	33.330	50.000
Dual	Dual-Class Structure (0,1)	865	0.009	0.096	0	1

Table 3 presents the results of t-tests for the major explanatory variables. The dependent variable (RD) was analyzed to determine whether there is a significant difference in R&D investment between companies with and without a dual-class stock structure. As shown in Table 3, companies with a dual-

class stock structure have significantly higher R&D investments compared to those without such a structure on the STAR. This indicates that, to some extent, adopting a dual-class stock structure is associated with increased R&D investment.

Table 3: T-Test Results for Major Explanatory Variables.

Variables	G1(0)	Mean1	G2(1)	Mean2	MeanDiff
RD	857	18.43	8	19.94	1.504***

3.3. Research Design

To test the influence of the dual-class stock structure on enterprise innovation, this paper constructs the following model based on data from companies listed on the STAR:

$$RD_{i,t} = \alpha + \beta_1 Dual_{i,t} + \sum ControlVariables + \lambda_{in} + \lambda_t + \varepsilon_{i,t} \quad (1)$$

Here, $RD_{i,t}$ represents the innovation level of enterprises. R&D investment is chosen as the designated index because, compared to patent applications and other indicators, R&D investment directly reflects innovation activities over a short period and serves as a reliable quantitative measure. The model includes the primary explanatory variable (Dual) and control variables, with fixed effects for industry λ_{in} and year λ_t also accounted for in the regression analysis.

4. Regression Results of Dual-Class Stock Structure and Corporate Innovation

Table 4 presents the regression results based on the above model. Column (1) shows the results of the univariate regression, while Column (2) includes control variables. According to the results in Column (2), with other conditions held constant, the regression coefficient for Dual is 0.655 and is significant at the 1% level. This indicates a significant positive correlation, suggesting that the dual-class stock structure has a notable effect on promoting enterprise innovation, thereby confirming H1. Regarding the control variables, the study finds that company size and ROA significantly influence innovation, while leverage, tangible assets ratio (Tang_assets), and board size do not. Board independence (Board_ind) has a negative but marginally significant effect. These results are largely consistent with prior research.

Table 4: The Regression Results of Dual-Class Stock Structure and Corporate Innovation.

	(1)	(2)
	RD	RD
Dual	1.465*** (13.988)	0.655*** (8.574)
Size		0.968*** (40.697)
Leverage		-0.000 (-0.042)
ROA		0.015*** (3.678)
Tang_assets		-0.004 (-0.633)
Board_size		-0.101 (-0.790)
Board_ind		-0.007*

Table 4: (continued).

		(-1.655)
_cons	16.981***	-2.576***
	(160.192)	(-2.999)
N	865	865
r^2	0.088	0.738
Industry	Yes	Yes
Year	Yes	Yes

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

5. Conclusion

This paper summarizes the relationship between the dual-class stock structure and enterprise innovation through a literature review, and then uses actual data from companies listed on the Chinese STAR to verify this relationship in the context of the Chinese market. We examined a sample of 865 firms and conducted descriptive statistics, t-tests, and regression analyses. The findings indicate that, in the Chinese capital market, the use of the dual-class stock structure can promote corporate innovation, which aligns with previous literature. Additionally, this paper reviews the basic equity structures of eight companies using the dual-class stock structure on the Chinese STAR and finds that this structure indeed promotes enterprise innovation. However, it is also noted that, despite the common use of the sunset clause in dual-class stock designs, it has not yet been adopted in the Chinese capital market.

It should be noted that this study focuses exclusively on listed companies on the Chinese STAR. While the research uses typical data, the generalizability of the conclusions requires further testing and validation through additional studies. Future research should explore the potential for more companies in the Chinese market to adopt the dual-class stock structure to enhance their innovation capabilities. Moreover, it is hoped that more companies will consider the sunset clause to better protect the rights of dispersed shareholders. Future studies could also introduce more mechanistic analyses or use different samples and time intervals to conduct more comprehensive robustness tests.

References

- [1] Lease, R. C., J. J. McConnell, & W. H. Mikkelsen. (1983). The Market Value of Control in Publicly-traded Corporations. *Journal of Financial Economics*, 11(1-4), 439-471.
- [2] Gompers, P. A., Ishii, J., & Metrick, A. (2010). Extreme Governance: An Analysis of Dual-Class Firms in the United States. *Review of Financial Studies*, 23(3), 1051-1088. <https://doi.org/10.1093/rfs/hhp024>
- [3] Hauser, S., & Lauterbach, B. (2004). The Value of Voting Rights to Majority Shareholders: Evidence from Dual-Class Stock Unifications. *The Review of Financial Studies*, 17(4), 1167-1184.
- [4] Cumming, D., Meoli, M., & Vismara, S. (2019). Investors' choices between cash and voting rights: Evidence from dual-class equity crowdfunding. *Research Policy*, 48(8). <https://doi.org/10.1016/j.respol.2019.01.014>
- [5] Lu, Y., & Shi, H. (2022). Research on the determinants of financing of science and technology enterprises in China--machine learning analysis based on science and technology innovation board enterprises. *Financial Research*, (09), 132-151.
- [6] Qi, Y., & Xiao, X. (2020). Enterprise management changes in the era of the digital economy. *Management World*, (06), 135-152+250. [doi:10.19744/j.cnki.11-1235/f.2020.0091](https://doi.org/10.19744/j.cnki.11-1235/f.2020.0091).
- [7] Zhang, Q. (2019). Research on the dual ownership structure system of science and Technology Innovation Board--Based on an investor-protection perspective. *Shanghai Finance*, (09), 17-22. [doi:10.13910/j.cnki.shjr.2019.09.003](https://doi.org/10.13910/j.cnki.shjr.2019.09.003).
- [8] Dimitrov, V., & Jain, P. C. (2006). Recapitalization of one class of common stock into dual-class: Growth and long-run stock returns. *Journal of Corporate Finance*, 12(2), 342-366. <https://doi.org/10.1016/j.jcorpfin.2004.10.002>

- [9] Beladi, H., Hu, M., Yang, J., & Zhu, R. (2022). Dual-class stock structure and firm investment. *Finance Research Letters*, 47. <https://doi.org/10.1016/j.frl.2022.102939>
- [10] Aggarwal, D., Eldar, O., Hochberg, Y. V., & Litov, L. P. (2022). The rise of dual-class stock IPOs. *Journal of Financial Economics*, 144(1), 122–153. <https://doi.org/10.1016/j.jfineco.2021.12.012>
- [11] Li, H., Li, S., & Bi, X. (2017). Interest protection of small and medium investors under the dual ownership structure--Based on the case study of Facebook's acquisition of WhatsApp. *China's Industrial Economy*(01), 174-192. doi:10.19581/j.cnki.ciejournal.2017.01.010.
- [12] Cao, X., Leng, T., Goh, J., & Malatesta, P. (2020). The innovation effect of dual-class shares: New evidence from US firms. *Economic Modelling*, 91, 347–357. <https://doi.org/10.1016/j.econmod.2020.06.017>
- [13] Billings, M. B., Hsueh, K., Lewis-Western, M. F., & Shobe, G. (2023, January 1). Innovations in IPO Deal Structure: Do Up-C IPOs Harm Public Shareholders? *Management Science*, 69(5), 3048–3079.
- [14] Zheng, Z., Zhu, G., Li, Q., & Huang, J. (2021). Dual ownership structure, sunset clause and corporate innovation--evidence from American Chinese companies. *Economic Research*, (12),94-110.
- [15] Zhou, W., Gu, R., & Lu, S. (2020). Penetrating the real performance of SSE STAR enterprises: A double-market investigation. *Finance Research Letters*, 37. <https://doi.org/10.1016/j.frl.2019.101346>