

The Governance Effect of Short Selling Mechanism on Information Disclosure

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Abstract: This research takes A-share listed companies in China from 2013 to 2023 as the research sample, and empirically tests the impact of the short sale mechanism on the timeliness of annual report disclosure of listed companies by constructing a Difference-in-Differences (DID) model, with a total of 27035 valid observations obtained after sample screening. The results show that the short sale mechanism significantly increases the lag of annual report disclosure and reduces the timeliness of information disclosure of listed companies, and this conclusion still holds after robustness tests such as excluding the 2020 special sample and adopting the Tobit regression model. From the perspective of transmission mechanism, reducing information asymmetry and increasing analyst attention play a partial mediating role in the above impact, which can alleviate but not offset the disclosure delay effect caused by the short sale mechanism. Further heterogeneity analysis reveals that the delayed effect of short-selling mechanisms on annual report disclosure was significantly observed only in state-owned enterprises and those with higher internal control quality. This study enriches the achievements in related fields and provides empirical reference for supervision and enterprise practice.

Keywords: Short Sale Mechanism; Timeliness of Information Disclosure; The Temporal Lag of Annual Report Release; DID Estimation Strategy; Mediating Effect

1. Introduction

The promptness of data release represents a primary criterion for how listed firms communicate financial results, which directly governs the decisional speed of investors and the allocative capability of capital market. Past investigations into the short-selling system and

the reporting standards of corporate data transparency mainly focuses on the veracity and integrity of information disclosure, while the exploration into the temporal aspect is relatively scarce.

Based on this, the current study takes A-share listed companies from 2013 to 2023 as samples, constructs A DID model, systematically tests the impact of short sale mechanism on the reporting schedule of annual financial statements, analyzes its mechanism from two perspectives of information asymmetry and analyst attention, while also investigating the foundational influence of corporate ownership nature along with the standing of internal oversight on this impact.

The primary academic value of this work is essentially demonstrated in the following aspects: first, focusing on the existing academic void of information disclosure timeliness, this manuscript elucidates the positive consequence of short sale mechanism regarding annual report disclosure delay, and delivers verifiable insights for understanding the correlation involving the two in China's capital market; Second, from the perspective of information asymmetry, attention, an analyst at double reveal intermediary path, clarify the transmission mechanism, rich shorting mechanism research governance effect; Thirdly, it scrutinizes the varied effects of the nature of ownership as well as the grade of internal control, so as to provide reference for the formulation of differentiated regulation and corporate disclosure strategies.

2. Literature Review and Hypothesis Formulation

Foreign research on short sale mechanism started earlier. Miller (1977) [1] proposed the hypothesis that "restricting short sale will lead to stock price overvaluation", and believed that short sale can integrate negative information into market pricing and improve market efficiency. Boehmer & Wu (2013) [2] confirmed that the

short sale activity is positively correlated with the quality of corporate financial information, and the short sale mechanism has a significant role in external supervision. In domestic research, Jiang et al. (2024)[3] found that short sale pressure can inhibit the equity pledge behavior of controlling shareholders, reflecting its positive role in corporate governance; Hsu feng (2025) [4] confirmed that the short selling system by raise the cost of management accounting information manipulation, reversed transmission enterprise improving the quality of information disclosure, and alleviate the financing constraints. However, some studies have pointed out that the short sale mechanism may have negative effects. For example, Goldstein & Guembel (2008) [5] warned that short sellers may manipulate the market through false information and cause abnormal stock price fluctuations. Coffee & Mitts (2020)[6] proposed real information driven to short the report the necessary mechanism is still a market correction. Influence factors regarding information disclosure timeliness can be categorized into internal and external governance environment. At the corporate level, Crabtree and Kubick (2014)[7] argued that an elevated level of organizational tax avoidance is, the greater the audit risk is, the longer the audit time is, and the more delayed the annual report disclosure is. At the level of external environment, Bamber et al. (1993) [8] pointed out that factors such as company size and profitability would significantly affect the timeliness of information disclosure; Whittred (1980)[9] confirmed auditor change negative influence on the annual report disclosure timeliness. In addition, there is a trade-off between the timeliness of information disclosure and audit quality, and early disclosure may reduce the reliability of financial reports. Previous investigations concerning the short-selling system and the promptness of data transparency is relatively limited. Some studies believe that the external supervision pressure of the short sale mechanism will promote the timely disclosure of information, so as to diminish the disparity of information between parties and the risk of short sale. Other studies believe that to circumvent the influence of short sale, enterprises will choose to delay how they release data and improve the standard of the report through more adequate information review and collation, that is, to adopt the strategy of "exchange time for quality". Li Dan

et al. (2010)'s [10] research provided support for this view. Their findings revealed a notable inverse relationship between the reliability as well as the speed of accounting information. In general, the existing research has not been clear the specific influence to the disclosure of information timeliness short mechanism, and lack of background heterogeneity analysis on China's capital market system and mechanism, it left a space for the research of this paper.

The implementation of the short selling mechanism makes face short of potential impact of listed companies, information disclosure behavior of enterprises will directly affect the short-seller decision-making and judgment of market investors. From the perspective of corporate behavior selection, the external pressure brought by the short sale mechanism may prompt enterprises to postpone the disclosure of annual reports strategically, mainly based on the following logic: first, to avoid the impact of short sale, the information review time is extended to improve the quality of the report; Second, in response to the market, more fully analyze business data collection, elongated disclosure cycle; The third is to seize the initiative of information by delaying the disclosure and reduce the market impact of negative information. Based on this, this paper puts forward the following hypothesis:

Hypothesis 1: the implementation of the short selling mechanism will be a significant increase in the annual reports of listed companies to disclose delay, reduce the timeliness of information disclosure.

The effect of short sale mechanism on the time delay of annual report disclosure plays a role through a specific intermediary path. From the perspective of information asymmetry, the implementation of short sale mechanism will encourage short sellers and investors to dig deeper into corporate information, and promote enterprises to disclose more internal information, which will reduce the degree of information asymmetry between enterprises and the market, relieve the pressure of disclosure of enterprises, and reduce the strategic delay of enterprises to avoid information risk. From the perspective of analyst attention, the implementation of short sale mechanism will make the target company become the focus of market attention, and analysts will increase the tracking and research of the target company, which will form stronger external supervision for the company and force

the company to accelerate the process of information disclosure. Based on this, this paper puts forward hypothesis 2:

Hypothesis 2: The short sale mechanism alleviates its positive impact on the annual report publication lag by reducing the extent of information gaps between parties and enhancing analysts' attention.

In China's capital market, the essence of corporate ownership and the standard of internal control are important institutional characteristics that influence the decision-making of enterprises' behaviors. From the perspective of ownership attributes, the governance background of state-owned entities is special, and their manner of revealing information is more standardized and cautious. Under the short-selling mechanism, to prevent short-selling risks, information review will be strengthened and the duration of the annual report release process will be extended; while non-state-owned enterprises have a higher degree of marketization and their information disclosure decisions are more flexible. They are less affected by short-selling shocks and how the short-selling system affects the time lag for annual report disclosure may not be significant. Regarding the standard of internal oversight, firms with high internal audit quality have more complete information systems and review processes, and are more sensitive to short-selling pressure. They will further strengthen information review and risk control to prolong the time lag for annual report disclosure. While enterprises with low internal control quality have relatively weak information disclosure systems and processes, and limited adjustment space. How the short-selling system affects the time lag for annual report disclosure may not be significant. In light of this, the current study presents hypothesis 3:

Hypothesis 3: The positive impact of short sale mechanism on annual report disclosure delay exists in state-owned entities, but lacks a notable impact on the private-sector sample, and is mainly reflected in listed companies with high internal audit standards, but lacks a notable impact on organizations with low internal audit quality.

3. Research Design

3.1 Data Origin and Selection of Observations

The current study chooses A-share listed companies from 2013 to 2023 as the primary

research subjects. After omitting firms in the finance and insurance sectors and those under special treatment, along with organizations lacking complete or valid information, 27035 valid observations are finally obtained. In this paper, the shorting of related data from taian (CSMAR) database and Wind database, information disclosure of data from the stock exchange's website and CSMAR database information disclosure, corporate finance and management data acquisition from CSMAR database, internal control quality data using DIB Internal Control Database related indicators. To avoid extreme value influence, 1% and 99% of all continuous variables on quantile shrinkage end processing.

3.2 Empirical Model and Variable Definition

To test Hypothesis 1, this paper constructs the DID benchmark regression model as follows:

$$\ln\text{reportlag}_{i,t} = \alpha_0 + \alpha_1 \text{did}_{i,t} + \sum \alpha_k \text{Control}_{k,i,t} + \mu_i + \lambda_t + \varepsilon_{i,t}(1)$$

Where, i represents individual listed companies, and t represents the year, and the explanatory variable for the annual report disclosure lag ($\ln\text{reportlag}_{i,t}$) is the natural logarithm of the number of days between the end of the accounting year and the actual date of the annual report's release. $\text{did}_{i,t}$ is the core explanatory variable of the difference-in-differences term. This article draw lessons from the classical design of double difference method, the core set the following variables: (1). Whether the entity is eligible for margin lending and short selling (List) : if the firm belongs to the category of margin lending and short selling, it is 1; otherwise, it is 0; (2) Time point of short sale mechanism (Post) : 1 for the year after the firm is designated as a margin lending and short selling target, and 0 for the year before; (3) $\text{did} = \text{List} \times \text{Post}$, which is used to test the net effect of short sale mechanism on the temporal lag of annual report release. Are a series of control variables, integrated with prior studies, select the essential attributes that affect the timeliness of enterprise information disclosure as control variables, including: (1) firm magnitude (Size), which is the natural logarithm of the aggregate assets of the organization as of December 31st; (2) profitability on equity (ROE) pertaining to firms at the close of the period, calculated as the ratio of net income and net assets; (3) Audit quality (AQ), quantified via the absolute value of discretionary accruals derived from the modified Jones model, where a smaller

value indicates superior audit quality; (4) The ownership concentration of the lead shareholder (Top1) is the proportion of equity held by the primary owner relative to the overall share count at the period-end; (5) Debt-to-asset ratio (Lev) is the proportion of aggregate debt to total firm assets as of the year-end; (6) Directorate size (Board), which is the natural logarithm of the total count of board participants; (7) Net operating cash stream (CashFlow), the ratio representing the firm's net operating cash flow at the end of the year to its total assets; (8) enterprise Growth (Growth), operating income Growth of listed companies, namely the growing rate of the current revenue compared to the preceding term and the historical revenue level. Is the individual fixed effect, while the remaining term signifies the time fixed effect and the final component is the random disturbance term.

To test Hypothesis 2, we first test the influence of short sale mechanism on the extent of information gaps between parties, and the model is structured follows:

$$ASY_{i,t} = \beta_0 + \beta_1 did_{i,t} + \sum \beta_k Control_{k,i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (2)$$

The degree of information asymmetry (ASY) was incorporated into the benchmark model to test its mediating effect, and the model is as follows:

$$\ln reportlag_{i,t} = \gamma_0 + \gamma_1 did_{i,t} + \gamma_2 ASY_{i,t} + \sum \gamma_k Control_{k,i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (3)$$

Where is the index of information asymmetry. $ASY_{i,t}$

Secondly, the influence of short sale mechanism on analyst attention is tested, and the model is as follows:

$$\ln AnaAttention_{i,t} = \delta_0 + \delta_1 did_{i,t} + \sum \delta_k Control_{k,i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (4)$$

Analyst attention ($\ln AnaAttention$) was

incorporated into the benchmark model to test its mediating effect, and the model is as follows:

$$\ln reportlag_{i,t} = \theta_0 + \theta_1 did_{i,t} + \theta_2 \ln AnaAttention_{i,t} + \sum \theta_k Control_{k,i,t} + \mu_i + \lambda_t + \varepsilon_{i,t} \quad (5)$$

Where is the indicator of analyst attention after taking the natural logarithm of the number of analyst followings. $\ln AnaAttention_{i,t}$

In order to test Hypothesis 3, this paper groups the samples according to the ownership nature (state-owned/non-state-owned) and the quality of internal control (high/low), and puts the grouped samples into the benchmark regression model (1) for regression to test the significance and size difference of the DID coefficients under different groups.

3.3 Descriptive Statistics of Variables were Used

There were 27035 valid observations for each variable in this study, and the overall sample size was sufficient. The primary summary of indicators is presented in Table 1. According to information regarding the dependent factor $\ln reportlag$, variance exists regarding the reporting lag for yearly statements among A-share listed firms, but the dispersion degree is low, and this timing gap for the majority of organizations is at A medium level. The average figure for List stands at 0.673, demonstrating that 67.3% of sampled listed companies within the study group constitute margin trading targets. The mean values of Post and did are 0.458, indicating that 45.8% of the observations in the sample are in the stage following the introduction of the short-selling system, and the distribution associated with the DID term is consistent with the time point variables of the short sale mechanism.

Table 1. Descriptive Statistics

Variables	Sample size	Mean	Standard deviation	Minimum	Median	Maximum
$\ln reportlag$	27035	4.614	0.192	2.639	4.691	5.209
List	27035	0.673	0.469	0.000	1.000	1.000
Post	27035	0.458	0.498	0.000	0.000	1.000
did	27035	0.458	0.498	0.000	0.000	1.000
Size	27035	22.312	1.270	20.201	22.089	26.406
ROE	27035	0.061	0.106	-0.484	0.068	0.295
AQ	27035	-0.031	0.106	-0.905	-0.010	-0.002
Top1	27035	0.335	0.147	0.084	0.311	0.742
Lev	27035	0.403	0.190	0.059	0.396	0.836
Board	27035	2.111	0.194	1.609	2.197	2.639
CashFlow	27035	0.052	0.064	-0.125	0.050	0.234
Growth	27035	0.142	0.318	-0.496	0.097	1.689

4. Empirical Results

4.1 Benchmark Regression Analysis

The outcomes of the primary regression for Model 1 are detailed in Table 2. The empirical evidence suggests that in the regression models excluding external factors in column (1) and incorporating these variables in column (2), did coefficients are significantly positive and reach statistical importance at the statistical levels of 1% and 5% respectively, suggesting that even if enterprise characteristics and macro time factors are controlled, the implementation of short sale mechanism still significantly increases the reporting lag of yearly statements of listed companies. It also reduces how quickly information is shared, which verifies Hypothesis 1.

Table 2. Benchmark Regression Analysis

Explained variable	(1)	(2)
	lnreportlag	lnreportlag
did	0.019 *** (4.739)	0.008 ** (1.982)
Size		0.049 *** (14.871)
ROE		-0.164 *** (-12.268)
AQ		-0.084 *** (-7.625)
Top1		-0.029 (-1.446)
Lev		0.042 *** (3.273)
Board		-0.012 (-1.176)
CashFlow		-0.069 *** (-3.414)
Growth		-0.019 *** (-5.477)
cons	4.604 *** (2253.581)	3.557 *** (48.652)
Individual	Yes	Yes
Time	Yes	Yes
N	26689	26689
Adj. R ²	0.363	0.383

The predictive fit of the model increased starting at 0.363 and reaching 0.383 once these additional metrics were included, demonstrating that the inclusion of these factors improved the model's robust interpretive capacity, and the analysis accounted for both individual and time fixed effects, so the regression results were reliable.

4.2 Mechanism Test

Table 3 presents the findings from the mediating effect test, and the regression outcomes demonstrate that both mechanisms perform a mediating role. During the examination of the information asymmetry mechanism, Column (1) details that the did coefficient is -0.201, which possesses a significantly negative value at the statistical threshold of 1%, suggesting that the implementation of the short sale mechanism significantly reduces the degree of information asymmetry of listed companies. Column (2) shows that after ASY is included in the model, the did coefficient is 0.009 and attains significance at the 5% level, while the ASY coefficient is 0.007 and is noteworthy at the 10% level, indicating that the reduction of information asymmetry serves to dampen the positive impact of short sale mechanism on the temporal lag of annual report release.

In the examination of analyst attention mechanism, column (3) displays the regression output for short sale mechanism on analyst attention, and the did coefficient is 0.136, which reaches a significantly positive threshold at the statistical threshold of 1%, indicating how the implementation of the short sale mechanism significantly boosts the analyst attention for listed companies. Column (4) shows the benchmark regression results after the inclusion of analyst attention. The did coefficient is still 0.009 and significantly positive at the 5% statistical level, and the lnAnaAttention coefficient is -0.008 and significantly negative at the 1% statistical level, indicating that the improvement of analyst attention will significantly shorten the temporal lag of annual report release. Therefore, the positive effect associated with short sale mechanism on the reporting delay of yearly statements is alleviated, thereby supporting Hypothesis 2.

On the whole, although the short sale mechanism can alleviate the temporal lag effect of yearly reporting by reducing information asymmetry and increasing analysts' attention, this mitigation effect is limited, and the implementation of short sale mechanism still leads to the increase of the temporal delay pertaining to the annual report publication of listed companies.

4.3 Heterogeneity Test

This paper conducts heterogeneity test from the

two dimensions of enterprise ownership and internal control quality, and explores whether there are individual differences in the impact of short sale mechanism on the reporting lag of yearly statements. Table 4 shows the findings from the analysis of individual variations, which are grouped according to the property rights of the organization and the standing of internal oversight. The regression results associated with the ownership category show that the did coefficient within the group of state-owned enterprises in column (1) is 0.023, which reaches a significantly positive threshold at the statistical level of 1%, and the did coefficient within the group of non-state-owned enterprises in column (2) is 0.001 and insignificant, suggesting that the positive effect of short sale mechanism

associated with the annual report disclosure delay exists in state-owned entities, but lacks a notable impact on the private-sector sample. The regression outcomes for the internal control quality dimension show that in column (3), the did coefficient of high internal control quality samples is 0.021, which possesses a significantly positive value at the 1% statistical threshold, and the did coefficient pertaining to low internal control quality samples is 0.002, which lacks statistical importance, suggesting that the positive impact of short sale mechanism on annual report disclosure delay is mainly reflected within organizations with high internal audit standards. It has no significant effect on firms with low internal audit quality, which verifies Hypothesis 3.

Table 3. Mediating Effect Test

	Information asymmetry mechanism		Analyst attention mechanism	
	ASY	lnreportlag	lnAnaAttention	lnreportlag
did	-0.201 *** (-28.527)	0.009 ** (2.250)	0.136 *** (7.469)	0.009 ** (2.212)
Size	-0.251 *** (-38.751)	0.050 *** (11.962)	0.572 *** (34.595)	0.053 *** (12.503)
ROE	-0.450 *** (-17.103)	-0.161 *** (-12.721)	1.531 *** (22.676)	-0.153 *** (-11.880)
AQ	0.093 *** (4.805)	-0.085 *** (-8.478)	-0.158 *** (-2.979)	-0.086 *** (-8.525)
Top1	0.693 *** (18.753)	-0.033 (-1.417)	-0.222 * (-2.262)	-0.031 (-1.340)
Lev	0.221 *** (9.434)	0.040 *** (2.658)	-0.622 *** (-10.279)	0.037 ** (2.447)
Board	0.066 *** (3.432)	-0.013 (-1.148)	0.054 (1.105)	-0.012 (-1.073)
CashFlow	-0.423 *** (-11.945)	-0.067 *** (-3.088)	0.088 (0.989)	-0.069 *** (-3.189)
Growth	-0.016 ** (-2.517)	-0.019 *** (-4.730)	0.142 *** (8.824)	-0.018 *** (-4.522)
ASY		0.007 * (1.726)		
lnAnaAttention				-0.008 *** (-4.691)
cons	4.829 *** (33.513)	3.526 *** (37.966)	-11.353 *** (-30.687)	3.470 *** (36.948)
Individual	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes
N	26688	26688	26689	26689
Adj. R ²	0.771	0.383	0.712	0.383

Table 4. Heterogeneity Test

	State-owned enterprises	Non-soes	High internal control	Low internal control
	lnreportlag	lnreportlag	lnreportlag	lnreportlag
did	0.023 *** (3.478)	0.001 (0.131)	0.021 *** (3.497)	0.002 (0.344)
Size	0.043 ***	0.050 ***	0.034 ***	0.058 ***

	(7.663)	(11.959)	(6.517)	(11.732)
ROE	0.108 ***	0.178 ***	0.203 ***	0.134 ***
	(-4.526)	(-10.814)	(-7.203)	(-7.709)
AQ	0.077 ***	0.085 ***	-0.033	0.085 ***
	(-3.553)	(-6.521)	(-0.510)	(-7.052)
Top1	0.036	-0.038	0.058 *	-0.027
	(1.163)	(-1.338)	(-1.815)	(-0.914)
Lev	0.038 *	0.035 **	0.078 ***	0.032 *
	(1.716)	(2.201)	(3.746)	(1.708)
Board	0.010	-0.022	-0.009	-0.019
	(0.628)	(-1.584)	(-0.507)	(-1.221)
CashFlow	-0.053	0.077 ***	0.053 *	0.083 ***
	(-1.616)	(-3.013)	(-1.737)	(-2.585)
Growth	-0.002	0.023 ***	0.011 **	0.018 ***
	(-0.303)	(-5.263)	(-2.076)	(-3.229)
cons	3.532 ***	3.579 ***	3.848 ***	3.379 ***
	(28.077)	(38.058)	(32.829)	(30.613)
Individual	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes
N	8084	18573	12786	12758
Adj. R ²	0.460	0.348	0.394	0.373

5. Robustness Checks

To confirm the dependability of the primary regression findings, this study conducts robustness tests by eliminating the 2020 sample and using Tobit regression model to verify the consistency of the main regression conclusion. The findings are displayed in Column (1) of Table 5. The did coefficient is 0.008, which reaches a significantly positive threshold at the statistical threshold of 10% and aligns with the benchmark regression results, suggesting that the short sale mechanism still significantly increases the annual report disclosure delay after excluding special years. Considering that the temporal lag of yearly reporting has a certain value range, the current study employs Tobit regression model to replace the standard OLS regression, and the findings are displayed in Column (2) of Table 5. The did coefficient is 0.025, significantly positive at the statistical threshold of 1%, which further verifies the conclusion that the implementation of short sale mechanism significantly increases the reporting lag of yearly statements of listed firms.

Table 5. Robustness Test

	Eliminate 2020	Tobit
	lnreportlag	lnreportlag
did	0.008*	0.025***
	(1.807)	(9.306)
Size	0.050***	-0.004***
	(14.702)	(-3.088)
ROE	-0.173***	-0.206***

	(-11.810)	(-15.417)
AQ	-0.089***	-0.092***
	(-7.479)	(-7.834)
Top1	-0.032	-0.040***
	(-1.498)	(-4.922)
Lev	0.035***	0.029***
	(2.606)	(3.719)
Board	-0.013	-0.063***
	(-1.124)	(-10.299)
CashFlow	-0.068***	-0.092***
	(-3.127)	(-4.638)
Growth	0.020***	0.024***
	(-5.246)	(-6.402)
cons	3.520***	4.847***
	(45.910)	(177.811)
var(e.lnreportlag)		0.036***
		(116.265)
Individual	Yes	Yes
Time	Yes	Yes
N	23982	27035
Adj. R ²	0.379	

6. Conclusion

Focusing on the core research problem of how the short sale mechanism affects the timeliness of corporate information disclosure, as well as the impact path and situation differences that have not been clarified in the existing research, this paper comprehensively tests the relationship between the short sale mechanism and the temporal lag of annual report release, and finally obtains the following distinct and dependable

analytical findings: (1) The implementation of short sale mechanism significantly increases the reporting delay of yearly statements of listed companies along with reduces how quickly information is shared; (2) Short sale mechanism alleviates the reporting lag for yearly statements by diminishing the extent of information gaps between parties and increasing analyst attention, but the mitigation effect of both is limited; (3) There is significant heterogeneity in the effect of short sale mechanism on annual report disclosure delay. The positive effect only is present within state-owned entities and listed companies with high internal control quality, but lacks a notable impact on the private-sector sample and organizations with low internal control quality.

From the findings of this research, we should coordinate the supervision of short sale and information disclosure, implement differentiated disclosure control within state-owned entities and organizations with high internal control, and standardize the market information transmission. For enterprises, it is necessary to balance the timeliness and reliability of information disclosure, optimize the audit process, and enterprises with low internal control should improve the disclosure system to reduce information risk. As investors, the reasons for the delay of disclosure can be judged based on the characteristics of corporate property rights and internal control, so as to improve the scientific decision-making of investment.

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