



Impact of equity pledges on analysts earnings forecasts

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ABSTRACT

This study conducts an in-depth analysis of the relationship between the equity pledge phenomenon and analysts' earnings forecast behavior using China's A-share listed companies from 2017 to 2022 as the research sample. Findings indicate that the existence of equity pledges increases the error range, optimism, and disagreement among analysts when making earnings forecasts. However, for non-state-owned enterprises, companies with a relatively high proportion of institutional shareholders, and those with better transparency, the impact of equity pledges on analysts' forecasting behavior shows a weakening trend.

1. Introduction

Although equity pledges offer numerous advantages, they pose certain risks for the pledgor and pledgee. If the stock price of the pledged company falls to the warning line, the pledgor must add a margin to the account or increase the number of pledged shares within a certain period to stabilize the stock price and safeguard the interests of the pledgee. However, if the stock price drops to the liquidation line, the pledged equity may be subject to forced liquidation. This results in the transfer of the pledgor's control rights, affecting the secondary market, potentially leading to a stock price crash, and significantly reducing the pledgee's equity value (Wu et al., 2022). For small and medium shareholders within a pledged company, the equity pledge of major shareholders may be a form of arbitrage, exploiting the sharp fluctuations in stock prices before and after the pledge to hollow out a company's assets (Zhou et al., 2021). Therefore, regulatory authorities have issued several policies to regulate the equity pledge market and guide its stable and healthy development.

Securities analysts play a pivotal role as intermediaries between companies and capital markets. They systematically collect and process company information, communicating their analytical insights and rationale to the marketplace. This communication significantly influences investor sentiment, shaping investors' decision-making processes (Titman et al., 2022). Analysts must exercise independence, objectivity, thoroughness, and rationality in their judgments while meticulously guarding against any external distortions that could compromise the accuracy of their forecasts (Yu et al., 2021).

Publicly disclosed information regarding a company constitutes a vital information source for securities analysts in their analytical endeavors. Analysts meticulously sift through this public information, extracting and analyzing pertinent details using sophisticated financial tools. They further integrate this analysis with macroeconomic trends and the competitive dynamics within the industry to ascertain a company's standing within its sector.

Concurrently, investors scrutinize the company's public information. By combining this data with the research reports compiled by

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analysts, investors adjust their investment strategies and make informed decisions about investing in the company (Mihalyi and Scurfield, 2021). Thus, the role of securities analysts in facilitating the flow of information and shaping market perceptions cannot be overstated.

The existing literature on equity pledges focuses on the pledging company's perspective. It examines the impact of equity pledges on the value and risk of the company and its selective disclosure of information and earnings management to stabilize the stock price (Böhringer et al., 2021). Regarding analysts' forecasting behavior, the analyst profession has only been developed in China for over 30 years and is still in the exploratory stage. The existing literature primarily focuses on the impact of the completeness of information disclosure listed companies' equity pledges on analysts' earnings forecasting behavior when the analysts' brokerage firms are pledgees or underwriters (Babar and Habib, 2021). The literature on the aforementioned research directions is relatively comprehensive. However, there is a relatively scarcity of literature and research perspectives on the relationship between controlling shareholders' equity pledges and analysts' earnings forecasts.

We select China's A-share listed companies from 2017 to 2022 as the research sample to study the relationship between equity pledges and analysts' earnings forecasts. The findings reveal that equity pledges increase the error, optimism, and divergence of analysts' earnings forecasts. For a non-state-owned enterprise, the higher the proportion of institutional shareholders, the better the company's transparency, and the more the impact of equity pledges on analysts' forecasts will be weakened.

The research chain of this study is "Equity Pledge - Firm-level Factors and Analyst-level Factors - Impact on Analysts' Earnings Forecasts," linking equity pledges and analysts' earnings forecasts. Moreover, it analyzes and discusses equity pledges and analysts' earnings forecasts, adds related literature, broadens the scope of the study, and makes the existing literature increasingly complete, which is of particular significance for discussion.

2. Theoretical analysis and research hypotheses

Analysts harbor diverse perspectives regarding the practice of equity pledges, with some viewing it as advantageous while others contend that it can undermine a company's value and hinder its long-term development (Nguyen, 2020). A company's stock price volatility plays a crucial role in determining whether pledged shares will face liquidation. This scenario can alter shareholders' equity stakes or even result in shifts in controlling interests. Consequently, controlling shareholders have strong incentives to stabilize their stock prices.

Thus, investors heavily rely on analysts' recommendations when adjusting their investment portfolios by increasing or decreasing their holdings (Sun and Lei, 2021). During the equity pledge period, shareholders frequently communicate with analysts to mitigate stock price fluctuations. In these interactions, shareholders often emphasize the company's current positive operational aspects while potentially overlooking or concealing any underlying issues. This approach disseminates positive information to the market, reducing the risk of stock price volatility.

Consequently, analysts tend to exhibit greater optimism in their forecasts during the equity pledge period (Vamossy, 2021), potentially stemming from the positive information conveyed by shareholders, which analysts incorporate into their assessments and projections.

The quality of analysts' forecasts largely depends on the comprehensiveness and accuracy of information, with private information playing a crucial role. Although public information tends to be homogeneous, acquiring private information allows analysts to gain a comprehensive understanding of the company (Lee and Zhong 2022). The greater the differences in the extent of private information obtained, the more significant the variations in analysts' forecast results (Tsang et al., 2023). Typically, companies disclose information to analysts with whom they have good relationships, enabling these analysts to possess increased private information and exacerbating the dispersion of analysts' earnings forecasts (Wang et al., 2021).

Thus, this study proposes the following hypotheses.

H1. Controlling shares in equity letters will increase the error, optimism, and divergence of analysts and complete forecasts.

In China, the nature of enterprise property rights leads to significant differences in management style, difficulty of loans, and other aspects. Regarding company management, the government's policy on state-owned enterprises is inclined toward avoiding the loss of state-owned assets. However, the constraints of private enterprises' management mode are weaker than those of state-owned enterprises, with private enterprises having more personal color, being faster, and having more convenient management (Xu et al., 2021). Furthermore, the government endorses SOEs. Under the influence of the government, banks are more inclined to lend money to SOEs, with relatively low loan interest rates and without closely analyzing the company's operating conditions; hence, the lending environment for SOEs is highly relaxed (Cai et al., 2021). Meanwhile, private enterprises do not have political advantages and rely on their reputation to finance. Thus, private enterprises with a good reputation can obtain loans; however, for private enterprises with a relatively low reputation and small scale, banks may not lend loans considering risks. Thus, private enterprises require a higher value of the collateral and are subjected to significant constraints on financing. Obtaining a loan is relatively more difficult (Gelfand et al., 2022). Policies stipulate that SOEs' equity cannot be forced to close out when the equity pledge reaches the closeout line, resulting in the weaker voice of the pledgee when the SOEs' equity is pledged. Furthermore, when a situation that requires forced closeout occurs, it may be resolved privately, weakening the autonomy of the pledgee (Rohleder et al., 2022). However, the pledgee is active and has more autonomy when pledging equity in private firms. For risk considerations, banks tend to accept equity in reputable and well-performing privately listed firms as pledges rather than state-owned firms (Yasar, 2021).

Thus, this study proposes the following hypothesis.

H2. *Ceteris paribus, equity pledges by controlling shareholders of state-owned firms weaken the error and optimism in analysts' earnings forecasts compared to non-state-owned firms.*

Institutional investors play a vital role in corporate governance and analyst compensation. Institutional investors, as professional investors, can weaken a company's agency problem as well as improve the corporate governance and accounting management levels, thus improving the quality of corporate disclosure, which is conducive to analysts' access to information to make accurate judgments. Davidson (2022) argues that institutional investors attach increased importance to unbiased research results. Analysts will publish highly accurate reports on the institutional investors' long stock positions. According to the previous literature review description, two opposite theories exist on the relationship between institutional investors and analysts' earnings forecasts, namely, the maintenance of institutional investor relation effect and information transparency effect

Thus, this study proposes the following hypothesis.

H3. *Ceteris paribus, a listed company with equity pledges having a long position in a fund company reduces the error, optimism, and divergence of analysts' earnings forecasts.*

The primary source of analysts' earnings forecasts is the public information published by the company and the private information of the company. The more transparent a company is, the more readable its reports are. Moreover, the more timely, comprehensive, accurate, and complete a company's disclosures are, the more public information is available to analysts (Hossain et al., 2022). Publicly available information reveals the company's existing business status in detail. Public information is what the company discloses after conducting audits. Accounting firms audit financial statements, which are subject to laws, regulations, and public supervision. The disclosure covers a broader range of information and has higher credibility. Hence, increasing public information reduces the error and divergence in analysts' earnings forecasts and reduces their unquestioning optimism. Furthermore, research shows that high-quality disclosure affects the transparency of public information and increases the transparency of private information; the cost of analysts' access to information decreases, quantity of information increases, quality of information improves, and accuracy of forecasts further improves (Shen et al., 2023).

Thus, this study proposes the following hypothesis.

H4. *Ceteris paribus, the higher the firm's transparency, the lower the error, optimism, and disagreement of analysts' earnings forecasts.*

3. Study design

3.1. Sample selection

This study selects China's A-share listed companies from 2017 to 2022 as the initial sample. To ensure the accuracy of the results, we exclude ST, *ST, delisted companies, research objects with missing data, and the data of enterprises in the financial and insurance industries. Finally, we obtain 98,786 observations. The data mainly come from the China Stock Market & Accounting Research Database (CSMAR) and Wind databases.

3.2. Definition of variables

3.2.1. Dependent variable

Analyst earnings forecasts (*Analst*): This study measures analyst earnings forecast error (*Analst_S*), optimism (*Analst_O*), and disagreement (*Analst_D*).

One of the indicators of analyst earnings forecast error (*Analst_S*) is defined in the study as follows:

$$Analst_S = \frac{|AF_{i,t,j} - A_{i,t}|}{p_{i,t}} \quad (1)$$

Analyst earnings optimism (*Analst_O*) is defined in the metrics study as follows:

$$Analst_O = \frac{AF_{i,t,j} - A_{i,t}}{p_{i,t}} \quad (2)$$

Analyst disagreement degree (*Analst_D*) is defined in the metrics study as follows:

$$Analst_D = \frac{Std(AF_{i,t,j})}{p_{i,t}} \quad (3)$$

where $AF_{i,t,j}$ is the analyst's forecast of the firm's earnings per share in year t , $A_{i,t}$ is the actual value of the firm's earnings per share in year t , $p_{i,t}$ is the closing price of the firm's stock at the beginning of year t , and $Std(AF_{i,t,j})$ is the standard deviation of all analysts' forecasts of earnings per share for firm i in period t .

3.2.2. Independent variables

Equity Pledge (*Pledge*): The value is 1 when a shareholder has an equity pledge in the firm's year-end report; otherwise, it is 0. A shareholder who made a pledge and released it during the year is classified as not having an equity pledge.

Table 1
Variable definition table.

Variable type	Variable name	Variable symbol	Definition
Dependent variable	Analyst earnings forecasts	<i>Analst_S</i> <i>Analst_O</i> <i>Analst_D</i>	Eq. (1) was used for calculation. Eq. (2) was used for calculation. Eq. (3) was used for calculation.
Independent variable	Share pledge	<i>Pledge</i>	The value is 1 if there is a pledge of equity by the shareholder, and 0 otherwise.
Control variable	Enterprise size	<i>Size</i>	Natural logarithm of total assets of listed companies at the end of the year
	Financial leverage	<i>Lev</i>	Ratio of total liabilities to total assets of listed companies at the end of the year
	Shareholding ratio of the largest shareholder	<i>First</i>	Shareholding of the largest shareholder of listed companies at the end of the year
	Corporate Growth	<i>Growth</i>	Growth rate of main business income of listed companies
	Enterprise financial performance	<i>ROA</i>	Return on total assets of listed companies at the beginning of the year
	Cash flow	<i>CFO</i>	Ratio of net cash flow from operations to year-end total assets of listed companies
	Equity market value to book ratio	<i>MB</i>	Market value at end of period divided by book value

Table 2
Descriptive statistical analysis.

	N	Mean	Std	Min	Max
<i>Analst_S</i>	98,786	0.037	0.103	0	6.495
<i>Analst_O</i>	98,786	0.019	0.116	−2.324	6.275
<i>Analst_D</i>	98,786	0.356	0.493	0	9.963
<i>Pledge</i>	98,786	0.447	0.516	0	1
<i>Size</i>	98,786	22.382	1.574	17.909	27.736
<i>Lev</i>	98,786	0.436	0.197	0.009	0.927
<i>First</i>	98,786	0.329	0.153	0.029	0.0909
<i>Growth</i>	98,786	0.307	1.524	−0.437	2.167
<i>ROA</i>	98,786	0.063	0.085	−3.935	6.958
<i>CFO</i>	98,786	0.063	0.107	−0.168	0.254
<i>MB</i>	98,786	2.183	1.776	0.254	10.767

Table 3
Results of the main regression test.

	(1)	(2)	(3)
	<i>Analst_S</i>	<i>Analst_O</i>	<i>Analst_D</i>
<i>Pledge</i>	0.017*** (16.84)	0.026*** (21.03)	0.103*** (18.95)
<i>Size</i>	0.007*** (5.53)	−0.016*** (−11.76)	0.058*** (29.93)
<i>Lev</i>	−0.026*** (−14.39)	−0.019*** (−22.86)	−0.075*** (−11.93)
<i>First</i>	−0.010*** (−5.59)	−0.003** (−2.27)	0.001*** (7.73)
<i>Growth</i>	−0.027* (−1.73)	−0.006*** (−17.85)	0.001 (0.95)
<i>ROA</i>	−0.773** (−19.77)	−0.695*** (−22.06)	0.376*** (32.95)
<i>CFO</i>	−1.026** (−2.15)	−0.894*** (−3.35)	−1.253*** (−2.39)
<i>MB</i>	0.176 (1.27)	0.258* (1.73)	0.158*** (3.26)
<i>Ind</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>Cons</i>	0.375*** (3.23)	−0.876*** (−5.29)	−1.336*** (−7.29)
<i>N</i>	98,786	98,786	98,786
<i>Adj.R²</i>	0.295	0.363	0.194

3.2.3. Control variables

In this study, control variables are firm size (*Size*), financial leverage (*Lev*), first most significant shareholder ownership (*First*), firm growth (*Growth*), firm financial performance (*ROA*), cash flow (*CFO*), and stock market capitalization book-to-bill ratio (*MB*).

Table 4
Endogeneity test.

	Phase I	Phase II		
	Pledge	Analst_S	Analst_O	Analst_D
<i>Pledge</i>		0.023*** (13.79)	0.035*** (18.26)	0.131*** (17.36)
<i>Pledge_Year</i>	1.259*** (5.24)			
<i>Controls</i>	Yes	Yes	Yes	Yes
<i>Cons</i>	0.735*** (3.26)	2.053*** (4.63)	1.557*** (5.25)	1.787*** (4.63)
<i>Ind</i>	Yes	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes	Yes
<i>N</i>	98,786	98,786	98,786	98,786
<i>Adj. R²</i>	0.526	0.273	0.285	0.306
<i>Chi2</i>		1337.69	1495.27	1526.33

Furthermore, this study includes industry (*Ind*) and year (*Year*) dummy variables to control for industry and year-fixed effects.

Table 1 presents the definitions of specific variables.

3.3. Model construction

The basic model of the article is set up as follows:

$$Analst_{i,t} = \alpha_0 + \alpha_1 Pledge_{i,t} + \alpha Control_{i,t} + \sum Year + \sum Ind + \varepsilon_{i,t} \quad (4)$$

4. Empirical analysis

4.1. Descriptive statistical analysis

Table 2 presents the results of the descriptive statistical analysis. The mean value of the *Pledge* is 0.447, indicating that nearly half of the controlling shareholders in the sample have equity pledges. The mean values of *Analst_S*, *Analst_O*, and *Analst_D* are 0.037, 0.019, and 0.356, respectively, indicating that the differences in analysts' earnings forecasts in the sample are minor.

4.2. Main test regression results

Table 3 outlines the correlation between equity pledges and analysts' earnings forecasts. The regression analysis reveals that the coefficients linking equity pledges to analysts' earnings forecasts are positive and statistically significant at 1%. This finding confirms H1, suggesting that when controlling shareholders of listed companies pledge their equities, the accuracy of analysts' earnings forecasts decreases and their forecasts optimism increases. Furthermore, the dispersion in earnings forecasts among different analysts increases.

Several factors contribute to this phenomenon. First, equity pledges by controlling shareholders increase information asymmetry, potentially leading to self-interested behaviors. Moreover, behavioral finance factors, such as emotional and cognitive biases, play a role. Finally, the inherent difficulty and risk associated with earnings forecasting exacerbate analysts' challenges. Consequently, analysts may struggle more when making earnings predictions, leading to decreased accuracy, more optimistic outcomes, and greater forecast variability among analysts.

4.3. Endogeneity

This study adopts an instrumental variable (IV) approach, employing two-stage least squares (2SLS) regression, to address the potential endogeneity issues arising from omitted variables. The IV chosen for the equity pledge dummy variable is the average equity pledge rate within a specific year-province combination, denoted as *Pledge_Year*. The rationale behind this selection stems from the observation that various factors, including the local economic environment, financial policies, legal frameworks, and pledge practices, frequently influence the equity pledge behavior of listed companies within a region. The *Pledge_Year* indicator captures these pervasive regional influences, thus exhibiting a correlation with the equity pledge dummy variable.

As a regional metric, *Pledge_Year* primarily mirrors the local pledge culture or environment and is not directly implicated in shaping individual firms' analyst earnings forecasts. Rather, its influence on these forecasts is mediated primarily through its impact on firms' equity pledge behavior.

Table 4 presents the findings of the 2SLS regression, employing the year-province average as the IV. In the first-stage regression, the IV, *Pledge_Year*, demonstrates a statistically significant positive correlation with the equity pledge dummy variable (*Pledge*) at the 1% significance level. In the case of second-stage regression, equity pledge retains a statistically significant positive association with

Table 5
Regulatory analysis (1).

	(1) Analst_S	(2) Analst_O	(3) Analst_D
<i>Pledge</i>	0.013*** (17.29)	0.005*** (11.83)	0.049*** (13.76)
<i>Soe</i>	−0.025*** (−11.76)	−0.019*** (−21.75)	−0.036*** (−9.95)
<i>Pledge</i> × <i>Soe</i>	0.013*** (14.47)	0.026*** (8.05)	−0.026 (−0.73)
<i>Controls</i>	Yes	Yes	Yes
<i>Cons</i>	2.336*** (5.53)	−1.865*** (−7.93)	−0.334*** (−7.27)
<i>Ind</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>N</i>	98,786	98,786	98,786
<i>Adj.R</i> ²	0.303	0.375	0.095

Table 6
Regulatory analysis (2).

	(1) Analst_S	(2) Analst_O	(3) Analst_D
<i>Pledge</i>	0.013*** (12.59)	0.011*** (22.64)	0.075*** (14.83)
<i>Fund</i>	−0.026*** (−16.59)	−0.008*** (−19.93)	0.047*** (20.75)
<i>Pledge</i> × <i>Fund</i>	−0.017*** (−15.75)	−0.011*** (−11.98)	−0.007*** (−3.63)
<i>Controls</i>	Yes	Yes	Yes
<i>Cons</i>	3.207*** (3.97)	−1.775*** (−5.26)	−0.654*** (−5.35)
<i>Ind</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>N</i>	98,786	98,786	98,786
<i>Adj.R</i> ²	0.303	0.323	0.085

Table 7
Regulatory analysis (3).

	(1) Analst_S	(2) Analst_O	(3) Analst_D
<i>Pledge</i>	0.015*** (23.96)	0.011*** (13.69)	0.079*** (27.75)
<i>Tran</i>	−0.007*** (−11.37)	−0.001*** (−6.69)	0.053*** (18.46)
<i>Pledge</i> × <i>Tran</i>	−0.008*** (−11.76)	−0.005*** (−15.28)	−0.034*** (−10.95)
<i>Controls</i>	Yes	Yes	Yes
<i>Cons</i>	2.163*** (4.05)	−1.095*** (−3.79)	−0.945*** (−4.26)
<i>Ind</i>	Yes	Yes	Yes
<i>Year</i>	Yes	Yes	Yes
<i>N</i>	98,786	98,786	98,786
<i>Adj.R</i> ²	0.315	0.267	0.182

analyst's earnings forecasts at the 1% significance level. After incorporating the IV, the regression results of this study remain robust, thus affirming the initial findings.

4.4. Regulatory effect

Next, this study explores whether the effect of equity pledges on analysts' earnings forecasts is related to a firm's ownership relationship. This study defines a listed company, which is a state-owned enterprise, as *Soe*. If it is a state-owned enterprise, *Soe* takes the value of 1; otherwise, it is 0. An interaction term *Pledge* × *Soe* is added to the model; Table 5 presents the results, showing that the coefficients of the interaction term *Pledge* × *Soe* on analysts' error and optimism are significantly positive and that the coefficients of

disagreement are negative but not significant. This finding indicates that SOE pledges increase analysts' errors and optimism in earnings forecasting; thus, H2 is confirmed.

In this study, the sample is categorized into institutional long positions according to the median shareholding of institutional investors. If the proportion of institutional holders (*Fund*) is greater than the median, it takes the value of 1; otherwise, it is 0. Table 6 shows the results of adding the interaction term $Pledge \times Fund$ to the model. The coefficients of the interaction term $Pledge \times Fund$ are significantly negative, suggesting that the higher the proportion of institutional holders, the more it will ameliorate the impact of equity pledges on the forecasts of analysts' earnings; thus, H3 is confirmed. The higher the proportion of institutional shareholders is, the more attention analysts will pay to the company. Moreover, analysts will continue to track and exchange information with institutional investors to better grasp the company's future development status and reduce their earnings forecast errors.

This study adopts the CSMAR database to rate the transparency of listed companies based on the disclosure of the Shanghai and Shenzhen Stock Exchanges. The assessment of transparency is categorized into four grades, namely, excellent (A), good (B), qualified (C), and unqualified (D). In this study, excellent (A) and sound (B) are defined as the attainment group, whereas qualified (C) and unqualified (D) are defined as unattained values. Finally, the variable *Tran* is set up. If it is an attainment group, *Tran* takes the value of 1; otherwise, it is 0 and constructs the interaction term of $Pledge \times Tran$. Table 7 presents the regression results. The coefficient of the interaction term is significantly negative, indicating that the higher the transparency of listed companies, the more specific the company's development trend and the more comprehensive the financial information disclosure. This facilitates the market and analysts to understand the company's dynamics; reduces the cost of analysts' information collection; and weakens the impact of equity pledges on analysts' earnings forecast error, optimism, and disagreement. Thus, H4 is confirmed.

5. Conclusion

This study examines the relationship between equity pledges and analysts' earnings forecasts using a sample of China's A-share listed companies from 2017 to 2022. Findings indicate that equity pledges are associated with increased errors, optimism, and divergence in analysts' earnings forecasts. Furthermore, in non-state-owned enterprises, a higher proportion of institutional shareholders and improved company transparency mitigate the impact of equity pledges on analysts' forecasts.

Accordingly, several avenues for future research emerge. First, exploring the influence of different motives behind equity pledges and the macroeconomic environment on analysts' predictions will be insightful. Second, strengthening regulatory oversight of corporate governance and information disclosure practices is crucial. Third, enhancing analysts' independence and professionalism can further improve the accuracy and reliability of their forecasts. Fourth, adopting advanced statistical methods and models can deepen our understanding of this complex relationship.

Finally, disseminating these research findings and enhancing investor education are essential in helping investors better comprehend and assess the implications of equity pledges on analysts' predictions. Thus, we can empower investors to make more informed decisions and reduce investment risks.

CRedit authorship contribution statement

Xiaoguang Gao: Supervision, Software, Resources, Investigation, Funding acquisition, Formal analysis. **Juncheng Luo:** Validation, Supervision, Software, Resources, Methodology, Funding acquisition, Formal analysis. **Qiang Zhao:** Visualization, Validation, Software, Resources, Investigation, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

The authors do not have permission to share data.

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