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Analysis of the Market Reaction to the Information on Mergers and Acquisitions of High-Tech Family-Owned Companies in China

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ABSTRACT

Mergers and acquisitions (M&A) are used by many companies as a strategy for business expansion. Despite the turbulence of this market in recent years, family-owned companies often act as strategic acquirers, especially in the high-tech sector of the economy. Chinese family-owned companies are active players in this market. The **object** of the study are mergers and acquisitions performed by Chinese family-owned companies in high-tech sector of the economy from 2018 to 2022. The **purpose** of the study is the reaction of the Chinese stock market to the announcements on mergers and acquisitions made by high-tech public family-owned companies. The study was conducted by event study and multiple regression analysis methods on a sample of 259 Chinese family companies that had announced mergers and acquisitions in the high-tech sector. It was revealed that the market reacts positively to information about such transactions: 75% of deals in the sample generate positive cumulative abnormal returns, 1.7% higher on average than the return calculated based on the market model. Shareholder value increases as the share of family ownership in the acquiring company increases and decreases as the share decreases. Market reaction is positive when a deal diversifies the core business portfolio. If a chief executive officer does not belong to the owner's family, the deal is perceived negatively by the market. A positive market reaction is related to the independence of the acquirer's board of directors, whereas the large size of the board of directors is negatively associated with cumulative abnormal returns. Cross-border deals are negatively related to the market reaction. The results of the study may be useful for the management of Russian companies considering internationalization and investors due to the growing economic ties between Russian and Chinese businesses. They are also of interest to researchers who study mergers and acquisitions in emerging markets.

Keywords: mergers and acquisitions; family-owned companies; Chinese market; high-tech companies; event study analysis

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INTRODUCTION

In recent years, the mergers and acquisitions market (hereinafter referred to as M&A) has been characterized by significant turbulence. In 2021, the total value of M&A transactions in the world reached a record amount of \$ 5.9 trillion. Subsequently, it decreased: in 2022 by 36%, and in 2023 by another 15%. Nevertheless, over the past decade, the value of transactions has never fallen below \$ 3.2 trillion. In 2023, the market structure has changed by types of customers. The value of transactions made by strategic investors and serial acquisition companies decreased by only 6%, while transactions made by venture capital funds and private equity funds fell in value by 42% compared to 2022. Given this circumstance, M&A transactions made by companies — strategic or serial buyers are of particular interest to researchers in the current conditions.

Family companies that are under the control of the founder or his descendants and family members often act as such buyers [1]. They are characterized by features of corporate governance related to the resolution of possible contradictions between shareholders representing the company controlling the family and noncontrolling shareholders, as well as between controlling shareholders and the family itself [2, 3]. The level of family control affects both the acquisition decision itself and the market expectations regarding the transaction [4]. Since the owners of family businesses strive for longterm development and welfare growth, strategic investments in the acquisition of high-tech companies are fully consistent with their goals [5].

The purpose of this paper is to study the reaction of the Chinese financial market to information on M&A transactions of high-tech family companies. The choice of the country is explained by the large number of such companies in the Chinese market, as well as the long-term

high activity of Chinese companies in the mergers and acquisitions market [6].

FAMILY FIRMS AND M&A DEALS IN CHINA

Family companies include firms under the shareholder control of the founder or members of his family by blood or marriage [7]. The works [8, 9] revealed a positive reaction of shareholders to information on M&A transactions carried out by family high-tech companies in Canada, decreasing as the concentration of family control increases. As a result, the basic hypothesis of our research is as follows:

H0. In the Chinese financial market, the reaction of shareholders to announcements of M&A transactions made by family-owned high-tech companies is statistically significant and positive.

Analyzing the effectiveness of M&A transactions, researchers come to the conclusion that family companies can use the innovative potential of acquired firms better than nonfamily ones [10]. A high level of trust between shareholders and management allows family companies to successfully build long-term relationships with employees, suppliers and customers [11, 12]. Family companies are less prone to risk than non-family companies, which is explained by the concept of socio-emotional wealth [7]: the desire to preserve family values is the motive for abandoning high-risk decisions that, even potentially profitable, can jeopardize these values.

Comparing the financial performance of family and non-family Indian companies, A. Gupta and T. Nashier [13] concludes that the presence of non-family executives and board members contributes to increasing the market value of companies with a low share of family ownership. However, as the share of family property increases, the effectiveness of monitoring by representatives of non-family shareholders decreases.

Based on the studied literature, we hypothesize: H1: The reaction of the stock market to the announcement of M&A transactions made by high-tech Chinese companies varies depending on

¹ Global M&A Report 2024: Gaining an edge in a market reset. New York, NY: Bain & Company; 2024. 120 p. URL: https://www.bain.com/globalassets/noindex/2024/bain_report_global_m_and_a_report_2024.pdf (accessed on 30.01.2024).

the share of family property in the equity capital of the acquiring company: with a high share of family ownership, it is positive, and with a low share it is negative.

The desire to preserve the socio-emotional wealth of the family explains the tendency of family companies to take over in industries not related to the core business [14, 15]. This allows owners to diversify their business portfolios without selling family shares.

The authors of the article [16], considering the acquisition of research and development (R&D) companies by family companies, revealed contradictory trends. In an effort to preserve socio-emotional wealth, such firms avoid risky decisions in the short term. However, investments in R&D allow you to increase value in the long term, which is in the interests of family companies. The authors suggested that family firms invest less in R&D compared to non-family firms, but the variety of these investments is higher than that of non-family firms. These conclusions also support the hypothesis of the tendency of family companies to diversify long-term investments:

H2: The reaction of the Chinese financial market to information about diversifying M&A transactions carried out by family-owned high-tech companies is statistically significant and positive.

The paper [17] notes that the level of risk is affected by the diversity of the boards of directors: the lower it is, the more risks Chinese family companies take. The authors of the study come to similar conclusions [18]: the small size of the board of directors, the presence of independent directors and the separation of the positions of the chairman of the board of directors and the general director reduce the conservatism of family firms in relation to M&A transactions. Although the presence of hired top managers tends to increase the operational and financial performance of the company [19], managers — members of the controlling family are more successful in implementing acquisitions than hiring CEOs [8].

Based on the above, a third hypothesis can be formulated.

H3: If a high-tech family company is managed by a professional (hired) manager, the reaction of the

Chinese market to information about its acquisitions will be significant and negative.

DATA COLLECTION AND ANALYSIS

The empirical study was conducted by event analysis using the Win.d database, which contains information on M&A transactions for the period 2018–2022. At the first stage, Chinese public companies were selected that meet the following criteria: the controlling stake belongs to members of the same family; the company's activities belong to the field of high technology. The selection of industries was made on the basis of a work [20] describing the boundaries and features of high technologies in China. Next, data on M&A transactions were collected according to the following criteria: the dates of the transaction announcement and its completion are known; the acquisition or merger transaction has the status of completed (privatization and business restructuring transactions were not considered); the value of the transaction exceeds \$ 10 million or the equivalent amount in Chinese yuan.

More than 4700 observations obtained during the initial unloading were cleaned as follows. First, observations with missed values are excluded. Secondly, repeated transactions within one year for one company are excluded to avoid the effect of superimposing one event on another. Thirdly, the presence of company shares in the stock exchange listing during the transaction period has been clarified. Finally, shares of companies that had events that could potentially affect prices during the periods under review were excluded. There are 259 observations left in the final sample.

For each company, using the Stratosphere.io database, data on share prices, the CEO of the company, the size and composition of the board of directors, the share of ownership belonging to the founder's family, and other corporate governance data were collected.

² URL: https://www.wind.com.cn/portal/en/WDS/index.html (accessed on 30.01.2024).

Table 1

Description of Variables for the Models of the Study

Variable	Description				
1. Family control and family structure					
Family ownership stake (FO_stake)	The percentage of company shares owned by the family				
Control Enhancement Mechanisms (CEM)	Dummy variable: takes the value 1 if the acquiring company has multiple clas of voting shares, pyramidal or cross-ownership, and 0 otherwise				
Dummy variable for hired CEO (CEO)	Dummy variable: 1 if the acquiring firm was led by a non-family CEO before the transaction, and 0 if the CEO was a member of the controlling family				
2. Acquiring Company Characteristics					
Institutional Ownership Dummy Variable (IOW)	Dummy variable: 1 if one or more institutional investors own 10% or more of the acquiring firm's shares before the transaction, and 0 if the institutional investor ownership is less than 10%.				
Board Independence (BI)	Ratio of the number of non-company directors to the total number of board members in the acquiring firm before the transaction				
Board Size (BS)	Number of board members in the acquiring firm before the transaction				
Dual employment (CEOCOB)	Dummy variable: 1 if the CEO of the acquiring firm is also the chairman of the board before the transaction, and 0 if these positions are not combined				
3. Company Characteristics — Targets вместо Goals Transactions					
Public Target Company (PT)	Dummy variable: 1 if the target company is listed on a stock exchange, and 0 if the target company's shares are not traded on an exchange				
Diversification (D)	Dummy variable: 1 if the acquirer and target company have different activity classifications, and 0 if the acquirer and target company have the same activic classifications				
Cross-border transaction (CB)	Dummy variable: 1 if the target company's country of jurisdiction is not China, and 0 if a Chinese firm is being acquired				
Transaction value (log_value)	Logarithm of the total transaction value				

Source: Compiled by the authors.

Table 1 presents the variables used in the construction of research models. Dependent variable is the cumulative excess return of the shares of the acquiring company (cumulative abnormal return, CAR). The selection of independent variables was based on the work of other researchers who considered similar problems [2, 8, 21–25].

The distribution of the number of transactions by year is shown in *Fig. 1*. The peak value in 2021 is explained by the economic recovery in the post-pandemic period. There is an increase in the number of transactions, i.e. family companies in China are increasing their activity in the mergers and acquisitions market.

Fig. 2 shows the distribution of the sample companies by the share of family property in the capital. The minimum value of the entire sample and the first group is 11.5%, the maximum value of the sample and the last group is 62.5%. Groups of companies with the smallest and largest shares of family ownership in the capital are few (8 and 6 out of 259 companies, respectively), groups of companies with shares of family property from 20 to 30% and from 40 to 50% are represented almost the same (65 and 64 respectively) and account for 52% of the entire sample. Companies with a family share of 30 to 40% (116 companies, or 46.5%) have the largest representation.

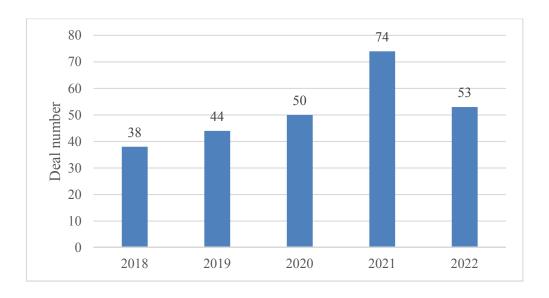


Fig. 1. The Distribution of M&A Deals by Year

Source: расчеты авторов / Authors' calculations.

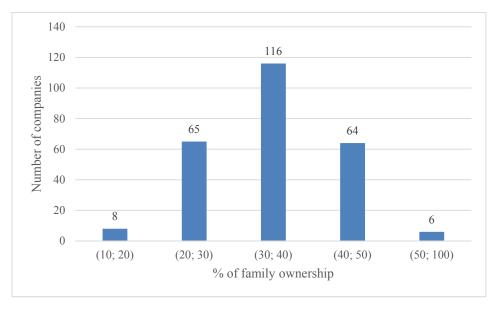


Fig. 2. The Distribution of Companies by the Share of Family Ownership in Capital from the Interval, % Source: Authors' calculations.

Fig. 3 reflects the dynamics of diversifying transactions. The peak falls on 2021. It can be seen that companies are making more and more diversifying transactions: their share in the total volume of transactions in 2018–2019 averaged 57%, and in 2020 and 2022 it increased to 68%. In total, 167 such transactions were realized over a five-year period (64.5% of all transactions).

Full descriptive statistics of variables are presented in *Table 2*.

In 71% of cases, the acquiring firm was managed by a general director who was not a family member before the transaction. In 65% of transactions, the buyer and the target company belong to different classifiers of activity. In 31% of transactions, the target company is public. In 27% of transactions, the acquiring company has mechanisms to strengthen corporate control, such as different classes of voting shares, pyramids or cross-ownership of shares. Cross-border transactions account for 26% of the total sample.

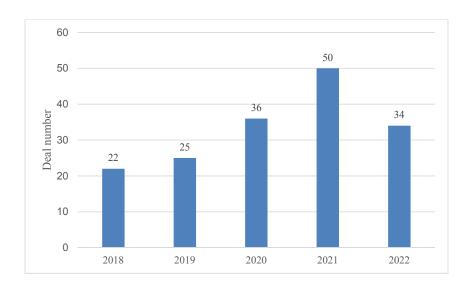


Fig. 3. The Distribution of Diversifying M&A Deals by Year

Source: Authors' calculations.

Descriptive Statistics for Variables

Table 2

Variable	Mean	Min	Max	Median
Family ownership stake (FO_stake)	0.3506	0.1152	0.625	0.3474
Control Enhancement Mechanisms (CEMs)	0.2703	0	1	0
Dummy variable for hired CEO	0.7066	0	1	1
Institutional Ownership Dummy Variable (IOW)	0.2201	0	1	0
Board Independence (BI)	0.72	0.62	0.77	0.74
Board Size (BS)	8.9	8	11	9
Dual employment (CEOCOB)	0.2162	0	1	0
Public Target Company (PT)	0.305	0	1	0
Diversification (D)	0.6448	0	1	1
Cross-border transaction (CB)	0.2625	0	1	0
Transaction value (log_value)	5.283	4.847	6.992	5.176

Source: Authors' calculations.

Cumulative Abnormal Return in the Event Window (CAR)

Window	Mean	Median	t-statistics	Share of positive CAR (%)
[-1; +1]	0.0171	0.0157	11.165***	74.90%

Source: Authors' calculations.

Note: Significance levels: "p < 0.001, t-statistics is given in parentheses.

In the event window [-1; +1], CAR is positive (+1.7%) and significant at the 0.1% level. Thus, the null hypothesis of zero average cumulative excess returns was rejected, and the study's main hypothesis (H0) was confirmed: that shareholders of high-tech Chinese family businesses react positively to news about M&A deals.

In 22% of transactions, the ownership share of institutional investors before the transaction exceeds 10%. 21.6% of transactions are carried out by acquiring companies, where the positions of CEO and Chairman of the Board of Directors are combined.

TESTING THE RESEARCH HYPOTHESES

The event study method was used for the research, which shows the short-term market reaction to information about the deal and is standard for its analysis [26]. The event study method [27] involves assessing the cumulative abnormal return (CAR). To calculate the market return, the SSE Composite Index is selected, and daily stock quotes are used. For each deal, the expected stock return of the company was calculated over a range of [-240; -40] days, where 0 is the day, the deal was announced. Excess return is defined by the formula:

$$AR_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i \times R_{mt}), \qquad (1)$$

where AR_{it} — excess return of stock i on day t; R_{it} — is the actual return of stock i on day t; R_{mt} — is the return of the stock exchange index on day t; $\hat{\alpha}_i \, \text{u} \, \hat{\beta}_i$ — are coefficients obtained from the regression equation of the relationship between stock and market returns over the estimation period, which is [-240; -40].

The sum of excess returns within the event window [-1, +1], where day 0 is the day, the deal was announced, represents the cumulative abnormal return (CAR). The choice of the event window is based on its use by other authors in

Diversified transactions are positively interrelated with the market reaction. This confirms the second hypothesis of our study and is consistent with the results obtained in the work [15]. In an article [8] that considered such a hypothesis, the results of its testing were insignificant. Perhaps the use of the activity code specified in the business licenses of organizations to determine the industry allowed us to more accurately determine whether the transaction is diversified.

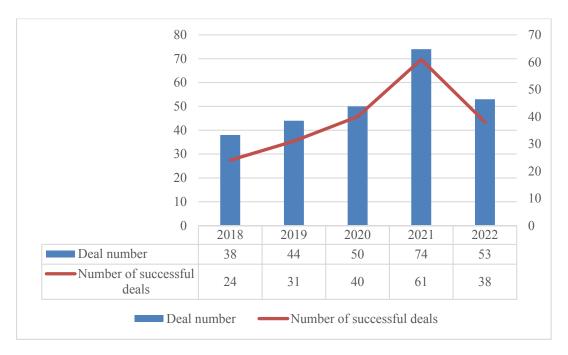


Fig. 4. Distribution of Deals with Positive CAR by Year

Source: Authors' calculations.

studies of similar events [9, 15]. The significance of the difference between the cumulative excess return and zero is tested using a parametric t-test. The results are presented in *Table 3*.

In the event window [-1; +1], CAR is positive (+1.7%) and significant at the 0.1% level. Thus, the null hypothesis of zero average cumulative excess returns was rejected, and the study's main hypothesis (H0) was confirmed: that shareholders of high-tech Chinese family businesses react positively to news about M&A deals. It should be noted that this dynamic is also characteristic of the Russian market: the increase in company value after M&A deals peaks at the time of the transaction and subsequently declines rapidly [28].

The distribution of transactions with a positive CAR by year (which can be considered successful in the short term) is presented in *Fig. 4*.

In 2020 and 2021, the share of successful deals was the highest for the entire observation period (80 and 82% respectively). In 2019 and 2022, the success rate of deals was slightly lower than in 2020 and 2021 (approximately 71%). In 2018, the share of transactions with a positive market reaction was over half of all transactions (63%).

By calculating the average family ownership share for transactions with negative and positive CAR, we obtained intuitive confirmation of the study's first hypothesis. For deals with a negative CAR, the share of family ownership in the acquiring companies' capital is 29.4%, while for deals with a positive CAR, it is 37%, meaning that the growth in the share of family ownership is positively correlated with the market's reaction to information about the deal.

Regression analysis was conducted to identify the relationships between the characteristics of companies involved in M&A transactions and the market reaction to information about the transactions. The first model includes all the variables presented in *Table 1*:

$$CAR_{i} = \beta_{0,i} + \beta_{1,i} \times FO_{stake} + \beta_{2,i} \times CEO + \beta_{3,i} \times CEM + \beta_{4,i} \times CB + \beta_{5,i} \times IOW +$$

$$+ \beta_{6,i} \times BI + \beta_{7,i} \times BS + \beta_{8,i} \times CEOCOB + \beta_{9,i} \times PT + \beta_{10,i} \times D + \beta_{11,i} \times \log_{2} value + \varepsilon,$$
(2)

where i — a separate event window for a specific transaction.

Results for four OLS models

Variable	Model 1	Model 2	Model 3	Model 4
FO_stake	0.1127	0.1129	0.1129	0.1136
	(8.343***)	(8.379***)	(8.390***)	(8.485***)
CEO	-0.0127	-0.0128	-0.0128	-0.0128
	(-5.641***)	(-5.699***)	(-5.724***)	(-5.751***)
CEM	-0.0013	-0.0013		
	(-0.587)	(-0.558)		
СВ	-0.0009			
	(-0.373)			
LOW	-0.0013	-0.0014	-0.0013	
IOW	(-0.546)	(-0.568)	(-0.542)	
ВІ	0.0659	0.0662	0.0663	0.0666
Ы	(2.909**)	(2.927**)	(2.938**)	(2.950**)
BS	-0.0070	-0.006944	-0.006959	-0.006964
D3	(-5.259***)	(-5.259***)	(-5.279***)	(-5.290***)
CEOCOB	0.0064	0.006341	0.006286	0.006261
	(2.617**)	(2.597**)	(2.581*)	(2.574*)
PT	-0.0081	-0.0081	-0.0082	-0.0082
	(-3.604***)	(-3.656***)	(-3.674***)	(-3.707***)
D	0.0100	0.0101	0.0101	0.0102
	(4.464***)	(4.505***)	(4.554***)	(4.651***)
	0.0035	0.0035	0.0035	0.0034
log_value	-1.347	-1.336	(-1.318)	-1.296
Intercept	-0.0220	-0.0224	-0.0225	-0.0227
	(-0.785)	(-0.801)	(-0.804)	(-0.815)
R 2	0.5904	0.5902	0.5897	0.5892
F statistic	32.37***	35.72***	39.76***	44.82***

Source: Authors' calculations.

Note: Significance levels: p < 0.05, p < 0.01, p < 0.001. t-statistics is given in parentheses.

In models 2–4, we consistently excluded variables that proved to be insignificant. In the second model, the variable representing the cross-border nature of the transaction was excluded; in the third model, the variable representing control enhancement mechanisms was excluded; and in the fourth model, the institutional ownership variable was excluded. The transaction cost variable is not excluded, as it has significant economic importance. The results are presented in *Table 4*.

For comparison and selection of the best model, the Akaike Information Criterion was used, according to which the fourth model was chosen:

$$CAR_{i} = \beta_{0,i} + \beta_{1,i} \times FO_{stake} + \beta_{2,i} \times CEO + \beta_{6,i} \times BI + \beta_{7,i} \times BS + + \beta_{8,i} \times CEOCOB + \beta_{9,i} \times PT + \beta_{10,i} \times D + \beta_{11,i} \times \log_{value} + \varepsilon.$$
(3)

The tests conducted showed that the variables are normally distributed, there is no correlation between the variables, and there is no heteroskedasticity or multicollinearity.

RESULTS AND DISCUSSION

According to the chosen model (*Table 4*), the variables were significant, at least at the 5% level: shares of family property, employed CEO, dual employment, size and independence of the board of directors, diversification and public purpose of the transaction.

The share of family property is positively related to the reaction of investors to information about M&A transactions, which confirms the hypothesis H1. It is also revealed that with a low share of family property, the CAR becomes negative (*Fig. 4*). This also confirms the first hypothesis of the study about the nature of the relationship between the market reaction and family ownership. The results coincide with those obtained in studies [8, 9], but contradict the paper [19], where it is claimed that the market reaction is higher when there is equality between family and non-family shareholders. The similarity with the results obtained in the article [8] can be explained by the similarity between Canadian and Chinese high-tech family companies in terms of such parameters as the cost of raised capital, the share of independent directors in the board of directors, the level of market regulation, etc.

A negative relationship between the fictitious variable of the hired CEO and the cumulative excess profitability was revealed, which confirms the third hypothesis of the study and coincides with the conclusions of the work [8]. The variable of dual employment of the manager, as well as the independence of the board of directors, has a positive relationship with excess profitability. Thus, investors react positively to transactions made by companies where family control is carried out through the combination of the functions of the general director and the chairman of the board of directors by the family representative. At the same time, the independence of the board of directors is important, which is consistent with the findings of the research [17, 18]. In the paper [18], the authors revealed that the smaller size of the board of directors causes a positive market reaction to the transaction. In our model, with the increase in the size of the board of directors, the excess profitability also decreases.

Diversified transactions are positively interrelated with the market reaction. This confirms the second hypothesis of our study and is consistent with the results obtained in the work [15]. In an article [8] that considered such a hypothesis, the results of its testing were insignificant. Perhaps the use of the activity code specified in the business licenses of organizations to determine the industry allowed us to more accurately determine whether the transaction is diversified.

Announcements of cross-border transactions, as can be seen from *Table 4*, have a negative connection with the market reaction. Although this connection is statistically insignificant, the result is interesting and can be explained by the rapid growth of the Chinese economy, which creates attractive opportunities for investment in companies within the country.

The reaction increases with the increase in the share of family property in the capital of acquiring companies; the decrease in the share of family ownership causes a weakening of the market reaction.

CONCLUSION

The work empirically proves that the announcements of M&A transactions of Chinese family public high-tech firms have a positive and significant relationship with the excess yield of buyers' shares, i.e. family property and family management positively create value for investors in the short term. The reaction increases with the increase in the share of family property in the capital of acquiring companies; the decrease in the share of family property causes a weakening of the market reaction. It is important for the market that the company is managed by a family member: if the CEO is not a

family member, the market reacts negatively to announcements of high-tech M&A transactions.

The results obtained are of interest to potential investors, as they allow you to predict how the prices of company shares will change at the time of the announcement of the transaction. Given the actively developing economic relations between China and Russia, there is reason to assume that the results of the study may be of interest to Russian investors, as they allow for a better understanding of ways of integration with Chinese buyers with family ownership and management.

One of the limitations of this study is that it is aimed only at studying the short-term reaction of shareholders to M&A transactions and does not consider changes in the investor wealth of the buyer firm in the long term. The relationship between investors' reactions and corporate control mechanisms is also not considered. In further studies, it is worth more carefully studying their features and the nature of the impact on investors' reaction to information on mergers and acquisitions.

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