Management Ability, Property Rights and Corporate M&A Performance — Empirical Evidence Based on Engineering Companies

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Abstract. The project is the cell of an enterprise, and the engineering project management is the foundation of the construction enterprise management. Strengthening the management research of the construction enterprise can improve the ability of the enterprise project to succeed in the market. M&A is an inevitable requirement of socialized large-scale production, an important way for enterprise expansion and industrial structure upgrading. This paper examines the impact of engineering company management ability on long-term M&A performance of companies, which takes 2014-2016 China A-share construction industry and real estate industry listed companies as samples. The paper analyses the lagging effect of management ability and corporate M&A performance, and uses group regression to test the regulation effect of property rights on management ability and M&A performance. This study finds that management ability has a significant positive impact on long-term M&A performance, that is, the stronger ability the management has, the higher performance the corporate mergers and acquisitions will show. Further research also indicates that under different property rights, there is no significant difference in the impact of management ability on long-term M&A performance. However, compared with non-state-owned enterprises, state-owned enterprises are more cautious about M&A, so their business performance is more stable.

1. Introduction
With the development of market economy and global integration, the competition between enterprises has become increasingly fierce. As a means of rapid growth, M&A have become a prominent phenomenon in the history of modern economy. Some scholars seek ways to improve M&A performance from the perspective of executive characteristics, information asymmetry between the two parties, and corporate culture. However, these studies rarely explore the role of management capacity in the process of M&A. This paper will take the management capability as the starting point, based on the perspective of M&A performance deeply explore the impact of management capacity on M&A performance, and further tests the similarities and differences of such relationships under different property rights.

The main contributions of this paper are as follows: Firstly, this paper takes management capacity as the starting point, studies the influence of management ability on the level of M&A. Secondly, this paper pays attention to the influence of managerial ability under different property rights, quantifies
the sensitivity of listed companies with different property rights to mergers and acquisitions. Finally, the results of this study can provide advice and decision support for companies to improve M&A performance and help to further standardize the professional manager market.

2. Literature review

The goal of maximizing the value of the company requires management to make strategic adjustments based on environmental changes, seize investment opportunities, improve investment efficiency, and efficiently allocate company resources. Mergers and acquisitions are considered to be important ways for enterprises to seek development. Compared with the long and unstable internal expansion process, mergers and acquisitions are gradually becoming the primary choice for their expansion. High returns are usually accompanied by high risks. The factors affecting M&A performance are mostly based on the characteristics of company managers and the internal and external environmental characteristics of the company.

In terms of company manager characteristics, He Ren and Shao Shuai (2019) proposed that the shareholding ratio of managers is positively related to the performance of M&A. Huang Xu et al (2013) believe that companies with the smaller the average age of executive teams, the shorter the average term and the larger the team size tend to adopt M&A behaviour; companies with larger woman proportion in executive teams tend not to conduct M&A.

Senior management is the company's most valuable human capital and plays a decisive role in the company's investment decisions. With the continuous integration of sociology, demography and behavioural finance, people began to explore the influence of investment decision-making on corporate behaviour from the perspective of the background characteristics of senior managers. Hambrick and Mason (1984) proposed the “high-level echelon theory”, arguing that top-level managers' decision-making behaviour is influenced by their background characteristics. Based on this, foreign academic circles have conducted in-depth research on the economic consequences of the background characteristics of managers. Demerjian et al. (2013) use their new approach to measure overall management capacity demonstrating that earnings quality is significantly positively correlated with senior managerial capabilities. These studies use empirical data from foreign mature capital markets to conclude that different levels of senior management capability can have a significant impact on the company's investment and financing decisions, disclosure policies and earnings quality. Domestic research on management capacity and innovation efficiency started late so the empirical research is relatively rare.

The impact of management capacity on corporate M&A performance is also expected to be influenced by the nature of corporate property rights. The government will impose strong intervention on state-owned enterprises for certain political goal. For this reason, state-owned enterprises may abandon investment-high-risk M&A projects. They may carefully evaluate their own conditions and target enterprises before M&A, so Effective mergers and acquisitions can be conducted in order to improve the long-term performance of the company. To this end, whether the influence of management ability on the performance of M&A is different due to the nature of property rights remains to be further tested.

3. Theoretical analysis and research hypothesis

Why do competent managers have a positive impact on corporate mergers and acquisitions?

First, the difference in management capabilities will reduce the information asymmetry between the company and the outside to some extent. This is because management with high management ability is more willing to release real company earnings information of its high efficiency in using assets. In addition, management capability itself is a kind of signal that reduces the degree of information asymmetry. The more effective management uses assets, the higher degree of external recognition company will receive. Whether the management can judge the changes in the social and economic environment and adjust the company's business strategy in a timely manner, whether it can effectively allocate the company's resources and improve the efficiency of capital investment,
determines the survival of the company. Under the same conditions, the companies with high management ability have a deeper understanding of the industry's development trend than the lower ones, which can more rationally allocate the company's existing resources and improve the M&A performance. In this regard, the first research hypothesis of this paper is proposed:

**H1: Management capacity is positively correlated with long-term M&A performance**

One of the most important institutional background issues in China's capital market is the impact of the nature of property rights. Listed companies can be divided into two types, state-owned companies and non-state-owned companies, depending on the nature of the property rights of the actual controllers, which provides a new research perspective of the relationship between management ability and the M&A performance.

The management of state-owned listed companies is subject to a series of assessments by superiors and performance indicators. The actual regulatory pressure is stronger than that of private ones. Therefore, the company's daily operations are more in compliance with laws, regulations and accounting standards. The company's accounting is more stable. Therefore, state-owned enterprises will be more cautious in making M&A decisions, which means that their long-term profitability is stronger. Therefore, this paper proposes the following research hypotheses:

**H2: Compared with non-state-owned listed companies, the state-owned listed companies have a more significant positive impact on M&A performance.**

4. Research Design

4.1. Sample selection and data source

This paper takes 2014-2016 China A-share construction industry and real estate industry listed companies as samples. 2016 is the latest annual data that this study can obtain from this study, and analyses the three-year A-share company samples. The specific steps are as follows: Firstly, in view of the particularity of financial enterprises, this paper first removes the samples of financial listed companies. Next, this article excludes samples with missing data. The number of final samples is 351. In order to eliminate the influence of outliers, this paper has a 1% winsorise for all continuous variables. All data in this article are from the CSMAR database.

4.2. Variable selection

4.2.1. Corporate M&A performance. Dependent variable M&A performance is measured by long-term M&A performance in order to measure the impact of managerial ability on M&A performance in the longer term. In view of the existing literature, corporate M&A performance is measured by the change in performance within one year before and after the merger, and is expressed by the change in the common financial indicator ROA.

4.2.2. Management Ability. This paper uses the model proposed by Dermerjian et al. (2012) to measure management capabilities. The basic steps of the method are as follows:

The first step is to use data envelopment analysis to measure the company's productivity (EFF). Sales revenue (Sales) is the sole output variable. Net fixed assets (FA), net R&D expenditure (Net R&D), goodwill (Good-will), intangible assets (Intan), operating costs (CoGS) and Sales expenses and management fees (SG&A) are used as input variables. Building the model (1):

\[
EFF = \frac{Sales}{a_1 FA + a_2 R&D + a_3 Good - will + a_4 Intan + a_5 CoGS + a_6 SG&A} \quad (1)
\]

The second step is to estimate management capacity (MA). Enterprise productivity can measure management ability in an approximate way. In order to eliminate the impact of production efficiency on the enterprise level, this paper selects the following enterprise-level factors that may affect the production efficiency: Size, Market Share, Free Cash Flow (FCF), Age (Age). Then build model (2) and use cutoff regression model to estimate management ability (MA):
EFF = \alpha_0 + \alpha_1 Size + \alpha_2 Marketshare + \alpha_3 FCF + \alpha_4 Age + \epsilon 

The residual \epsilon of the regression of model (2) can measure the ability of the management of the enterprise (MA).

### 4.2.3. Control variable

#### Table 1. Variable definitions

| Variable category | Variable name | Variable symbol | Variable definitions |
|-------------------|---------------|-----------------|----------------------|
| Dependent variable | M&A performance | \Delta \text{ROA} | \Delta \text{ROA}_{t+1}-\text{ROA}_{t-1} - \text{ROA}_{t-1}, |
| Explanatory variable | Management ability | MA | Demerjian (2012) ’s method |
|                     | Year of establishment | \text{Lnage} | \text{Ln(Year of establishment)} |
|                     | Fixed Asset Incentive | \text{PPE} | \text{Fixed Asset / Total Asset} |
|                     | Firm Size | \text{Lnta} | \text{Ln(Total Asset)} |
|                     | Tobin Q | \text{TQ} | \text{Market value / Total Asset} |
|                     | Assets liabilities ratio | Lev | \text{Total Asset / Total Liability} |
|                     | Capital Expenditure | \text{Capex}_\text{ta} | \text{Capital Expenditure / Total Asset} |
|                     | R&D Expenditure | \text{Rd}_\text{ta} | \text{R&D Expenditure / Total Asset} |
|                     | Management Compensation | \text{Lnsala} | \text{Ln(Salary of Management)} |
|                     | Management Shareholding Ratio | MSR | Proportion of the top three shareholders |

#### 4.3. Model building

This paper uses model (3) to examine the impact of management capacity on long-term performance of the firm. In addition, the model also adds industry fixed effects and annual fixed effects in order to control the impact of the industry and the year:

\[
\Delta \text{ROA}_{it} = \beta_0 + \beta_1 \text{MA}_{it} + \beta_2 \text{Lnage}_it + \beta_3 \text{PPE}_it + \beta_4 \text{Lnta}_it + \beta_5 \text{TQ}_it + \beta_6 \text{Lev}_it \\
+ \beta_7 \text{Capex}_\text{ta}_it + \beta_8 \text{Rd}_\text{ta}_it + \beta_9 \text{Lnsala}_it + \beta_{10} \text{MSR}_it + \epsilon 
\]

#### 4.4. Descriptive statistics

Table 2 reports descriptive statistics for each variable of the full samples. The long-term M&A performance (\Delta \text{ROA}) has a minimum of -2.83, a maximum of 0.42, and an average of -0.01, indicating a large difference in M&A performance among enterprises. Meanwhile, the maximum value of Tobin Q is 18.86, and the minimum value is 0.22. The value difference between enterprises is large. The standard deviation of management compensation is 0.64, indicating that the variation of this variable is great. In addition, the management capacity average is -0.018, the minimum value is -0.0191, and the maximum value is 0.507.

#### Table 2. Data descriptive statistics

| Variable | Obs | Mean | Max | Min | Std Dev. |
|----------|-----|------|-----|-----|----------|
| \Delta \text{ROA} | 991 | -0.01 | 0.42 | -2.83 | 0.12 |
| MA | 991 | -0.018 | 0.507 | -0.191 | 0.227 |
| \text{Lnage} | 991 | 1.75 | 3.14 | 0 | 0.65 |
| \text{PPE} | 991 | 0.18 | 0.56 | 0.02 | 0.66 |
5. Empirical analysis

5.1. The impact of management ability on long-term performance of the company

From Table (3), it can be seen that the companies with long-established feature can have better M&A performance. The greater the proportion of fixed assets in total assets is, the more sufficient production strength of the company is beneficial to the company's long-term production. The market value has a negative impact on the performance of mergers and acquisitions. For companies with high market value, there may be motives for blindly expanding in order to rapidly enlarge its scale. Because it is not familiar with the business field of the target company, the combined company will not be effective in allocating resources in deployment and production, resulting in inefficient operation of the entire organization. The regression results show that the improvement of the manager's salary makes the executives have no worries and can make full use of personal talents providing strategies for the development of organization. At the same time, Managerial Ability (MA) has a positive impact on the long-term M&A performance of the firm, and the regression coefficient is significant at the 1% level, which means that when the management ability of the company is high, it can increase the positive impact on M&A. H1 is thus verified.

5.2. Empirical analysis under different property rights

Table 3. Regression analysis result

| Variable | Full sample regression | State-owned enterprise | Non-state-owned enterprise |
|----------|------------------------|------------------------|---------------------------|
|          | β t                    | β t                    | β t                       |
| c        | 0.435*** 4.03          | 0.215*** 2.90          | 0.326*** 3.75             |
| MA       | 0.862*** 3.78          | 0.875*** 2.02          | 0.752*** 2.93             |
| Lnage    | -0.067*** -1.10        | -0.134*** -1.97        | -0.903*** -1.92           |
| PPE      | 0.778*** 0.87          | 0.904*** 1.21          | 0.826*** 1.02             |
| Lnta     | 0.329*** 10.35         | 0.189*** 7.41          | 0.228*** 8.19             |
| TQ       | -0.113*** -6.02        | -0.054*** -3.19        | -0.053*** -4.75           |
| Lev      | 0.179 1.32             | 0.084 0.98             | 0.0193 1.01               |
| Rd_ta    | 13.730*** 7.20         | 10.061*** 6.58         | 11.650*** 6.11            |
| Lnsala   | 0.194** 2.01           | 0.225** 1.67           | 0.0682* 0.81              |
| MSR      | 0.214** 1.83           | 0.651** 1.64           | 0.961** 1.24              |
| N        | 991                    | 136                    | 855                       |
| R²       | 0.322                  | 0.137                  | 0.087                     |
| F        | 10.65                  | 13.56                  | 7.39                      |

*Note: *** ** and * indicate significant levels at 1%, 5%, and 10% respectively.

In general, the impact of various indicators of state-owned enterprises on long-term M&A performance is milder than that of non-state-owned ones. The absolute value of regression coefficient of non-state-owned enterprises is larger indicating that the impact on M&A performance is more severe, and state-owned enterprises will be more cautious when making decisions on M&A. The whole organization system will be more stable. Therefore, when the external conditions change they will not quickly change to M&A. Compared with non-state-owned enterprises, the management ability of state-owned enterprises has a greater regression coefficient on long-term M&A performance,
indicating that it has a greater impact on long-term M&A performance. At the same time, the regression model of state-owned enterprises is more significant, thus verifying H2.

6. Conclusion
This paper takes management ability as the entry point and studies the relationship between management ability and M&A performance. This paper takes the data of A-share listed companies from 2014 to 2016 as the research object and empirically tests the influence of management ability on the long-term M&A performance of enterprises. The main findings are as follows: First, management ability has a significant positive impact on long-term M&A performance. In addition, under different property rights, management ability has a significant positive impact on long-term M&A performance, but its impact is not so different between and non-state-owned enterprises.

Of course, this article also has shortcomings. Contrary to the availability of data, the data used in measuring the management's ability is simplified compared with the previous literature. At the same time, this article only considers the long-term M&A performance of the enterprise, and the measurement of short-term performance is not involved. Therefore, future research can enrich experimental data and further explore the relationship between management capacity and corporate M&A performance.

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