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Equity and Debt Impacts on Overseas M&A Performance in the Transportation Sector

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Abstract:

The performance of overseas mergers and acquisitions (M&A) by listed companies in the transportation industry was assessed using the factor analysis method. Subsequently, an empirical analysis was conducted employing multiple regression to examine the determinants influencing the M&A performance of these companies. The findings indicate that a higher concentration of equity and a higher long-term debt ratio both significantly enhance the performance of overseas M&As for listed companies in the transportation sector.

Keywords:

Transportation industry listed companies; Overseas m&a performance; Influencing factors; Factor analysis; Multiple regression analysis model.

1. Introduction

The transportation system plays a crucial role in the exchange of materials, information, and energy both internally and externally within an economic region. It serves as a key facilitator for the efficient functioning of the economy. Listed companies in the transportation industry, as leaders in their field, have been expanding in scale, increasing their influence, and developing rapidly. With the growth of international trade, Chinese companies have increasingly engaged in various forms of overseas mergers and acquisitions (M&A), and listed companies in the transportation industry are no exception. However, given the complex and competitive international market environment, it is imperative to enhance the performance of these overseas M&As. This improvement is essential for Chinese transportation enterprises to elevate their international status and influence.

2. Performance evaluation of overseas mergers and acquisitions of listed companies in the transportation industry based on factor analysis

2.1. Selection of evaluation indicators and data sources

This article select the quick ratio (X1), the cash ratio (X2), total asset turnover (X3), accounts receivable turnover ratio (X4), return on equity (X5), sales net interest rate (X6), the growth rate of total assets (X7), operating income growth rate (by 8), and other eight financial performance indicators for the transportation industry carries on the comprehensive evaluation of overseas m&a performance of listed companies. After excluding some companies with incomplete data and financial anomalies, we finally get 43 sample listed companies in the transportation industry. All the index data are obtained from THE CSMAR database and the annual reports of listed companies

2.2. Factor analysis process

2.2.1. Feasibility analysis

KMO and Bartlett Sphericity Tests are generally used to conduct feasibility Tests before factor analysis. If the KMO value is generally greater than 0.5, it is considered to be suitable for factor analysis. The value in this paper is 0.510, so it is considered suitable for factor analysis.

Table-1 KMO and Bartlett Sphericity Tests

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.510
Bartlett's Test of Sphericity	Approx. Chi-Square	151.293
	df	28
	Sig.	.000

2.2.2. Extraction of characteristic roots and common factors

The common factor is determined by the characteristic root and the rotated factor loading matrix. The test results show that the data in this paper has three main factors, namely F1, F2 and F3.

Table-2 Characteristics of root and variance contribution

Factors	Initial eigenvalue			Extraction of sum of squares			Rotation of sum of squares		
	Total	Variance%	Accumulation %	Total	Variance%	Accumulation %	Total	Variance%	Accumulation %
1	2.499	31.241	31.241	2.499	31.241	31.241	2.385	29.815	29.815
2	1.628	20.345	51.586	1.628	20.345	51.586	1.724	21.547	51.362
3	1.311	16.394	67.979	1.311	16.394	67.979	1.329	16.618	67.979
4	.890	11.119	79.098						
5	.761	9.513	88.611						
6	.480	5.998	94.609						
7	.403	5.039	99.648						
8	.028	.352	100.000			.			
Extraction method: principal component analysis									

Table-3 Rotated Component Matrix

code	Component		
	1	2	3
X1	.056	.830	-.017
X3	.762	-.117	-.130
X4	-.048	-.261	.736
X5	.113	.593	.501
X6	.000	-.038	-.657
X7	.933	.163	.027
X8	.957	.115	.113
X2	-.004	.749	-.273

2.2.3. Calculation of factor scores

Factor score coefficient matrix is the final embodiment or expression of factor analysis. The specific score matrix of factor coefficient is shown in the table below.

Table-4 Component Score Coefficient Matrix

code	Component		
	1	2	3
X1	-.037	.488	.009
X3	.338	-.130	-.117
X4	-.017	-.131	.549
X5	-.006	.358	.392
X6	.016	-.041	-.497

X7	.388	.028	.005
X8	.400	.001	.068
X2	-.052	.437	-.185

Based on the new variables F1, F2 and F3 derived from the principal component analysis above, the comprehensive performance score of overseas mergers and acquisitions of listed companies in the transportation industry is obtained, and the formula is: F=(29.815*F1 +21.547*F2+16.618*F3)/67.979. Where F is the total score of overseas m&a performance, F1, F2 and F3 are scores of each factor.

Tab-4 Performance factors and total scores of overseas mergers and acquisitions of listed companies in the transportation industry

F1	F2	F3	F
2.026759328	1.043571877	0.790822957	1.413018263
-0.191482944	-0.034997043	-0.297104815	-0.167705219
-0.35951667	0.138032134	-0.45329917	-0.224742004
-0.020515436	-3.495661972	-0.469309676	-1.231728687
-0.50376542	1.010492577	-0.087062577	0.078061043
0.51004517	0.844731151	-0.589347445	0.347381441
-0.412472206	-0.735521335	-0.420465242	-0.516827673
0.194849421	0.616998287	0.104097975	0.306474024
-0.482422161	0.322865523	-0.49607695	-0.230518837
-0.415602726	-1.798476918	0.248083843	-0.691688906
-0.606164731	-0.406878845	0.304164201	-0.32046984
-0.466044139	0.132067016	0.378718994	-0.069961396
-0.307318016	0.270615382	-3.655717024	-0.942679982
-0.420051377	-3.303745643	1.462947923	-0.873775292
-0.279451485	0.578919326	0.263008238	0.125226902
0.520713043	-0.40375393	3.119924766	0.863094238
0.767446539	0.54560128	-0.322349469	0.430731341
-0.404737949	0.071873298	0.501174268	-0.032217214
-0.599963183	1.44900188	0.536452891	0.327285123
-0.494067591	-0.39007275	1.000422335	-0.095772289
-0.029769981	0.878898396	1.032427259	0.517908589
-0.103407041	0.23373097	-0.162464788	-0.010984562
-0.130891159	-0.133699745	-0.376046628	-0.191713488
-0.545745014	0.357773051	-0.785960774	-0.318091584
-0.443145542	1.37644642	2.024235896	0.736766631
2.495984192	0.492620446	0.189015998	1.297067172
-0.435709259	0.107971661	0.109550787	-0.130094459
-0.128992413	1.256633021	-0.074539551	0.323512624
-0.292458254	-0.961562677	-0.265980962	-0.498073015
-0.062215372	0.030332711	-0.301567893	-0.091393337
-0.431128797	0.045175077	-0.315490778	-0.251894607
-0.780617896	0.352818267	-1.523389863	-0.602945617
-0.143674366	0.442978528	1.428741829	0.426661746
-0.296116065	0.469596854	0.201807275	0.068305451

-0.538949884	0.074929661	-0.274301823	-0.27968386
0.111500503	-0.432476522	-0.682899103	-0.255117042
-0.555288733	0.084027299	-0.364592132	-0.306038474
5.013935201	-0.830357547	-0.843130968	1.729763802
-0.426310841	-0.780515013	-0.448729227	-0.544067977
-0.313540172	0.295242056	-0.619998663	-0.195497984
0.077398692	0.519153991	-0.050160771	0.186238123
0.098027915	0.263020375	0.380538301	0.219388161
-0.19512318	-0.598398576	-0.196149443	-0.32320133

3. Empirical analysis of influencing factors of overseas M&A performance of listed companies in the transportation industry

3.1. Variable selection and data sources

Dependent variable: Since the performance of overseas mergers and acquisitions of listed companies in the transportation industry is difficult to be reflected by a specific indicator, the total score of overseas mergers and acquisitions performance in the factor analysis above is selected as the dependent variable in this paper instead of the performance of overseas mergers and acquisitions. Independent variables: the proportion of tradable shares (M1), the shareholding ratio of the top five shareholders (M2), the proportion of state-owned shares (M3), the long-term debt ratio (M4), and the current debt ratio (M5) were selected as the independent variables of this paper. All data in this part are from CSMAR database and annual reports of listed companies.

3.2. Research Hypothesis

Based on the collation of authoritative literature and relevant theoretical analysis of factors affecting the performance of overseas mergers and acquisitions of listed companies in the transportation industry, the research hypothesis of this paper is obtained:

H1: The proportion of tradable shares is significantly positively correlated with the overseas M&A performance of listed companies in the transportation industry

H2: The shareholding ratio of the top five shareholders has a significant positive correlation with the overseas M&A performance of listed companies in the transport industry.

H3: The proportion of state-owned shares has a significant negative correlation with the overseas M&A performance of listed companies in the transport industry

H4: Long-term debt ratio is significantly positively correlated with the overseas M&A performance of listed companies in the transportation industry

H5: The current debt ratio is significantly negatively correlated with the overseas M&A performance of listed companies in the transportation industry

3.3. Regression analysis

In this paper, statistical software SPSS16.0 is used to carry out multiple linear regression on the influencing factors of overseas mergers and acquisitions performance of listed companies in the transportation industry, and all the entry variables are used to carry out regression on the model. The shareholding ratio coefficient test of the top five shareholders passed the test, the long-term debt ratio coefficient test passed the test, and the ratio coefficient test of tradable shares, state-owned shares and current debt ratio failed the statistical test. See the table below.

Table-5 Coefficients

Model		Unstandardized Coefficients		t	Sig.	Results
		B	Std. Error			
	(Constant)	-.175	.194	-.899	.374	

1	M1	2.617E-9	.000	.454	.652	Not supportive
	M2	3.468E-10	.000	1.924	.062	Supportive
	M3	-8.381E-11	.000	-.994	.327	Not supportive
	M4	.163	.027	6.075	.000	Supportive
	M5	-.443	.304	-1.458	.153	Not supportive

4. Conclusions and Suggestions

Factor analysis is used to evaluate the performance of overseas M&A of listed companies in the transportation industry. On this basis, multiple regression method is used to make an empirical analysis of the factors affecting the performance of overseas M&A of listed companies in the transportation industry. The ownership concentration on the transportation industry overseas m&a performance of listed companies have significant positive effects, long-term debt ratio of the transportation industry overseas m&a performance of listed companies has significant positive influence, proportion of tradable shares, proportion of state-owned shares, the flow ratio on the transportation industry influence of overseas m&a performance of listed companies is not significant. On the basis of this conclusion, the following countermeasures and Suggestions are put forward.

4.1. Appropriately raise long-term debt ratio

Because the long-term increase of the debt ratio indicates that the company has sufficient capital turnover and the company is in good financial condition, it is a message to show the company has good management to the whole society. Therefore, overseas m&a listed companies in the transportation industry should appropriately increase long-term debt ratio, so as to improve the performance of overseas M&A.

4.2. Moderately improve the company's equity checks and balances

The empirical analysis results show that the shareholding ratio of the top five shareholders has a significant positive impact on the performance of listed companies in the overseas m&a transportation industry. Therefore, the shareholding ratio of the top five shareholders of listed agricultural companies can be moderately increased to form appropriate checks and balances. This is conducive to the democratic centralization of the company's decision-making opinions, and is very beneficial to the improvement of the performance of listed companies in the overseas m&a transportation industry.

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