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Analysis on Financial Value of Relationship Capital

—A Case Study of SAIC Motor

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***Abstract*—As the recessive financial capital outside the legal organizational structure of enterprises, relationship capital has the characteristics of dynamics, asymmetry and difficulty to measure, which indicates that it is extremely challenging to measure its financial value. Based on the measurement of financial value created by relationship capital, this paper constructs a quantitative index system to measure the financial value of relationship capital by sorting out the existing research literature and systematically summarizing the ways to create financial value of enterprise's relationship capital. Based on the empirical results from SAIC Motor, it is shown that the Tobin Q values of SAIC Motor in the past four years are all greater than 1 and show an increasing trend, that is, their market values are above the book value; Relationship capital is positively correlated with enterprise value. Among them, social and horizontal relationship capital plays a more significant role in promoting enterprise value, followed by vertical relationship capital, horizontal relationship capital and employee relationship capital.**

Keywords—core competitiveness, financial analysis system, construction

I. INTRODUCTION

When capital was first proposed, it only represented material capital or its equivalent such as machine or money. In 1950s, compared with material capital, human capital, which is called "immaterial" capital, has greatly enriched the category of capital. It is believed that economic development is related to both the quantity and quality of laborers [1]. However, neither human nor material capital can fully explain the increment of value in enterprises. So the concept of capital and the areas involved are expanded again. The concept of "social capital" appeared in the field of sociology, "organizational capital" in organizational behavior, and "intellectual capital" in management. Under such context, "relationship capital" is proposed to study the social network resource of enterprises which is regarded as a kind of capital. Thus, relationship capital creates a new perspective for the formulation of enterprise strategy. It is another expansion of the capital theory after human capital. So far, the theoretical circle has not yet formed a unified authoritative definition of relationship capital. In combination with the relevant literature, the author defines the enterprise relationship capital as the special and unique resources that are established and prepared by the individual or the enterprises themselves, as behavioral subject, with their stakeholders to be maintained for a long time in order to achieve a certain purpose and its stakeholders. It covers five levels: first, the behavioral subject in this relationship can be an individual in the enterprise, or the enterprise as a whole name. Second, stakeholders is generalized, including their alliance partners, customers, governments and so on. Third, the establishment of the relationship has obvious purposes. For example, it is to obtain external scarce resources and achieve long-term cooperation to establish relationship with alliance partners; with the customers, it is to obtain their loyalty and stable profit source; with the government, it is to obtain political support and protection. Fourth, it is prepared to maintain long-term, which requires reciprocal relationship with mutual trust. Fifth, relationship capital, as a unique and special resource, is hard for other enterprises to imitate. They need to invest in proprietary assets.

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II. THE CONSTRUCTION OF MEASUREMENT INDEX OF FINANCIAL VALUE IN RELATIONSHIP CAPITAL

By systematically summarizing and sorting out the existing research literature, this paper constructs a four-dimensional index system to measure the financial value of relationship capital, as shown in TABLE I.

TABLE I. MEASUREMENT INDEX OF FINANCIAL VALUE IN RELATIONSHIP CAPITAL

Dimension of relationship capital	Index	Code	Explanation
Internal	Employee wage rate	RC1	Employee wage/ gross business revenue
	Executive officers pay rate	RC2	Executive officer wage/gross business revenue
	Return on equity of shareholders	RC3	(Profit after tax- preferred stock dividend)/shareholders' rights and interest
Vertical	Loyalty of customers	RC4	Sale revenue of top 5 customers/ main business income
	Sales growth rate	RC5	(Sale volume of this year- sale volume of last year) ÷sale volume of last year
	Dependence of suppliers (excluding related parties)	RC6	Procurement cost of top 5 suppliers/ Total purchase amount of enterprises
Horizontal	Number of cooperative enterprise	RC7	The number of enterprises of main non-supplier strategic cooperation
	Cooperation contribution	RC8	Percentage of globe sale of SAIC Motor, Volkswagen and GM in their joint venture companies in China
Society	Government subsidy rate	RC9	Current increase amount of government subsidy/total profit
	Cooperation between banks and enterprises	RC10	Cash from loans/total amount of funding
	Production-study-research cooperation	RC11	Fund of production-study-research/expenditure of research and development

In view of the fact that relationship capital, as intangible capital, is difficult to measure, the primary criterion for selecting measurement indicators is the availability of data, and variable substitution is selected for data that is not easy to obtain. Take the loyalty of customers and reliability of suppliers as an example [2], these two abstract indexes are usually obtained through questionnaires, but design defects and data processing errors of questionnaires also lead to data distortion. In economic practice, the top five customers are the most valuable customers for enterprises, and the top five suppliers are the most reliable sources of supply [3]. Their proportion is directly related to the size of the future sales and procurement costs of enterprises, and to some extent reflects the competitive advantage of enterprises in future business activities. Therefore, this paper selects the proportion of the top five customers in the operating income and the proportion of the top five suppliers' procurement cost in the procurement cost to replace the two indexes.

Theoretically, the cooperative contribution should cover SAIC Motor's value contribution to all non-supplier cooperative enterprises. However, as this data is complex and difficult to obtain, only the contribution to its core cooperative enterprises is recorded here. In addition, in May 2017, the Ministry of Finance issued the revision of *No.16 Accounting Standards for Business Enterprises - Government Subsidies*. SAIC Motor applied the future applicable law to this change of accounting policy, which had no impact on the financial statements of comparable years.

III. EMPIRICAL TEXT

A. Sample selection and data sources

There have been many empirical studies on the function of relationship capital of high-tech enterprises [4], but few studies on manufacturing enterprises, the pillars of the real economy. Therefore, this paper takes Shanghai Automotive Group Go., Ltd. (hereinafter referred to as "SAIC Motor") as the object of case study. There are several reasons for choosing this enterprise: first, as a state-owned holding group, it is self-evident for SAIC Motor to have government-related capital under China's socialist market economy system. Second, the company has been ranked among the top three manufacturers in China for several consecutive years. It can be said that it is the leader of China's automobile manufacturing enterprises, and its selection has certain representativeness and persuasiveness.

According to TABLE I, relevant data from 2013 to 2017 are selected for analysis to verify the direction and degree of influence of relational capital on the value of manufacturing enterprises. The main data sources are from the official website of SAIC Motor, east money website and CCER economic and financial database. And Excel and SPSS22.0 are used to analyze these data.

B. Key financial index of SAIC Motor

TABLE II. KEY FINANCIAL INDEX OF SAIC MOTOR

	2013	2014	2015	2016	2017
Liquidity ratio	1.25	1.19	1.05	1.11	1.00
Quick ratio	1.08	0.99	0.90	0.99	0.87
Quick ratio	56.71	55.41	58.78	60.20	62.39
Gross margin	12.84	12.36	11.42	12.87	13.47
Operating profit ratio	7.10	6.40	6.50	6.42	6.22
Return on total assets	10.30	9.70	8.65	7.98	7.17
Inventory turnover days	20.48	22.84	23.35	20.56	21.11
Days of accounts receivable turnover	11.08	11.47	13.62	14.47	13.71
Total assets turnover (times)	1.64	1.60	1.45	1.37	1.33
Growth rate of operating profit	2.13	0.38	8.06	11.11	11.72
Underlying earnings per share growth rate	19.55	12.76	6.50	7.43	1.93
Tobin Q value	0.98	1.12	1.04	1.04	1.13

Note: The Tobin Q value defined by American economist Tobin is equal to the ratio between the market value and the replacement cost of enterprise assets. However, since it is difficult to obtain the replacement cost of assets in practice, the company's net assets are used instead of the replacement cost of assets.

TABLE II shows that the overall solvency and profitability of SAIC Motor have declined in the past five years. The decline of its profitability has close relationship with China's overall automobile market. The decline in its solvency is due to the fact that its profitability is not enough to support its current operation, thus increasing its loan. The substantial increase in R&D investment of SAIC Motor in recent years is also one of the main reasons for its increase in loan.

The average numbers of days of inventory turnover in China’s automobile industry in the three years from 2014 to 2016 are 151.15, 93.2 and 61.84 respectively. The days of receivables turnover are 22.82, 8.24 and 6.03, respectively. Total assets turnover ratios are 0.25, 0.44, 0.64[4]. Compared

with average level in the industry, operating capacity of SAIC Motor is relatively excellent and stable.

C. *Pearson correlation analysis of relationship capital and enterprise value of SAIC Motor*

The result of correlation analysis of relationship capital and enterprise value of SAIC Motor is as follows:

TABLE III. THE RESULT OF CORRELATION ANALYSIS OF RELATIONSHIP CAPITAL AND ENTERPRISE VALUE OF SAIC MOTOR

	RC1	RC2	RC3	RC4	RC5	RC6	RC7	RC8	RC9	RC10	RC11
Enterprise value	.347	.078	-.395	-.416	-.360	-.197	.838	.581	.237	.067	.627

The correlation is significant at the level of 0.05 (two-tailed)

The correlation is significant at the level of 0.01 (two-tailed)

It can be seen that the correlation between the relationship capital of SAIC Motor and its value is not very strong, indicating that there is a lot of room for optimization of the value of its relationship capital. Specifically, its horizontal relationship capital and social relationship capital have a relatively obvious positive promoting effect on enterprise value, followed by internal relationship capital. Horizontal relationship capital will reduce its enterprise value [3].

D. *Regression analysis*

1) *Factor analysis*

In this study, 11 indexes are selected to measure the relationship capital of SAIC Motor. Although this can provide a lot of rich information, the information reflected by these indicators will inevitably overlap to a certain extent, which will lead to deviation in the accuracy and reliability of information fitting. Therefore, before the regression analysis, dimensionality reduction is carried out on the selected indexes, and the unrelated comprehensive indexes are selected to prepare for the subsequent multiple regression.

The indexes of SAIC Motor from 2013 to 2017 are selected, and the factor analysis results with SPSS22.0 are shown to be non-positive definite matrix. The main reason for this result is that this paper only selects SAIC Motor as a sample, but there are 11 indexes. However, we only select high eigenvalue as the common factor, so the influence of the result of non-positive matrix on the result of factor analysis is ignored here.

TABLE IV. COMMON DEGREE OF VARIABLE

	initial	extraction
RC1	1.000	.972
RC2	1.000	.983
RC3	1.000	.998
RC4	1.000	.991
RC5	1.000	.805
RC6	1.000	.971
RC7	1.000	.762
RC8	1.000	.960
RC9	1.000	.956
RC10	1.000	.926
RC11	1.000	.998

It can be seen from the above table that the commonality of the variable of factor analysis is very high, indicating that most of the information in these indexes can be advanced by factors and that the factor analysis results are effective.

TABLE V. FACTOR CONTRIBUTION RATE

Component	Initial Eigenvalue			The Extraction of the Sum of Squares and Loading		
	Total	Variance%	Grand Total%	Total	Variance%	Grand Total%
1	6.944	63.580	63.580	6.944	63.580	63.580
2	1.781	16.190	79.770	1.781	16.190	79.770
3	1.547	14.065	93.835	1.547	14.065	93.835
4	.678	6.165	100.00			
5	3.312E-16	3.011E-15	100.00			
6	2.273E-16	2.067E-15	100.00			
7	1.587E-16	1.442E-15	100.00			
8	3.019E-17	2.744E-16	100.00			
9	-7.195E-17	-6.541E-16	100.00			
10	-1.4488E-16	-1.317E-15	100.00			
11	-2.181E-16	-1.982E-15	100.00			

As can be seen from the above table, the eigenvalues of the first three factors are greater than 1, and the sum of their eigenvalues accounts for 93.835% in the total eigenvalues. Therefore, the first three factors should be extracted as the main factors to achieve dimensionality reduction. The three factors extracted here are represented as Y1, Y2 and Y3 respectively.

TABLE VI. ROTATION COMPONENT MATRIX

	Component		
	1	2	3
RC1	-.905	-.345	-.187
RC2	.785	.267	.544
RC3	.920	.381	-.077
RC4	.456	.856	.225
RC5	-.071	.269	-.853
RC6	.952	.254	.025
RC7	-.507	-.703	.104
RC8	-.892	-.337	.224
RC9	-.025	.538	.816
RC10	.941	.062	.189
RC11	-.222	-.972	.055

It can know from the analysis of rotating component matrix that employee wage rate RC1 and executive pay rate RC2, return on equity of shareholders RC3, dependence of suppliers RC6, cooperation contribution RC8 and cooperation between banks and enterprises RC10 are overloaded on factor 1, customer loyalty RC4, cooperation companies RC7 and production-study-research cooperation degree RC11 are overloaded on factor 2, sales growth RC5 and government subsidy rate RC11 are overloaded on factor 3.

TABLE VII. THE COEFFICIENT MATRIX OF COMPONENT SCORE

	Component		
	1	2	3
RC1	-.177	.033	-.050
RC2	.143	-.058	.255
RC3	.186	-.009	-.099
RC4	-.068	.325	.073
RC5	-.041	.183	-.479
RC6	.218	-.083	-.039
RC7	.004	-.248	.106
RC8	-.194	.019	.178
RC9	-.164	.249	.434
RC10	.250	-.185	.059
RC11	.149	-.446	.076

According to the above table, the linear relationship between 3 factors and 11 indexes is as follows:

Y1=–0.177RC1+0.143RC2+0.186RC3–0.068RC4–0.041RC5+0.218RC6–0.004RC7–0.194RC8–0.164RC9+0.250RC10+0.149RC11

Y2=0.033RC1–0.058RC2–0.009RC3+0.325C4+0.183C5–0.083RC6–0.248RC7+0.019RC8+0.249RC9–0.185RC10–0.446RC11

Y3=–0.050RC1+0.255RC2–0.099RC3+0.073RC4–0.479RC5–0.039RC6+0.106RC7+0.178RC8+0.434RC9+0.059RC10+0.076RC11

2) Multiple linear regressions

Regression analysis can determine the interdependent quantitative relationship among multiple related variables and help researchers accurately grasp the degree and direction of the influence of independent variables on dependent variables. According to the above dimensional reduction analysis, three main factors are taken as independent variables and enterprise value as dependent variables to carry out linear regression analysis. The contribution of relationship capital to enterprise value is quantified to obtain the model:

Tobin Q = –0.11Y1–0.040Y2+0.036Y3, R^2 is 0.680, which indicates that the significance of dimensions of relationship capital in SAIC Motor on its value is 68%.

TABLE VIII. SUMMARY OF RELATIONSHIP CAPITAL AND ENTERPRISE VALUE MODEL

R	R^2	R^2 after adjustment	The error of the standard estimate	Durbin-Watson
.825[a]	.680	-.279	.07560	3.435

a. Predictor variables: (constants), Y1,Y2,Y3

TABLE IX. ANOVA[B]

	Quadratic sum	Df	Mean square	F	Sig.
Regression	.012	3	.004	.709	.679
Residual error	.006	1	.006		
Total	.018	4			

From the significance of the above table, it can be judged that the model is not significant, which is attributed to the fact that there are many data periods and indicators selected for this sample enterprise.

IV. CONCLUSIONS

1. In the past four years, the Tobin Q values of SAIC Motor are all greater than 1 and show an increasing trend, that is, their market values are all above the book value, indicating that external investors are optimistic about the sustainable development of SAIC Motor. If this part of difference is regarded as the value contribution of relationship capital, it indicates that the income brought by the current relationship object of SAIC Motor is greater than the cost and can improve the enterprise value. The sample company should maintain and operate the existing relationship capital so that it can continue to play its role in value contribution.

2. According to the correlation and linear regression analysis, the most significant correlation in SAIC Motor is horizontal and social relationship capital and its value, followed by the internal relationship capital. The vertical relationship capital is negatively related to its enterprise value, which, in addition to the lack of empirical analysis and design, also may be due to the current situation in manufacturing industry in our country, especially in car manufacturing.

3. Relationship capital is positively correlated with enterprise value, and the value contribution of each dimension is different. Social and horizontal relationship capital has more significant effect on the promotion of enterprise value, followed by vertical relationship capital, horizontal relationship capital and employee relationship capital.

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