

Research on the Relationship between Assets Structure and Enterprise Value based on the Perspective of Life Cycle

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Abstract. The aim of this study is to direct the managers to dynamically allocate and manage assets and provide a new way of thinking for the managers to manage enterprise assets. Using the data of listed companies in small and medium manufacturing industry between 2014 and 2018, and the multiple regression model was used to analyze the relationship between assets structure and enterprise value at different stages of life cycle. The results showed that the stronger the liquidity of assets during the growth period and the mature period the higher the enterprise value, however, it was opposite during the recession period and there was no obvious correlation during the turbulent period. These results support the idea that there were differences in the impact of assets structure on enterprise value at different stages of life cycle. The innovation of this article is to study the impact of assets structure on enterprise value with the life cycle as the point cut.

1. Introduction

Coase proposed that the enterprise can play a role in resource allocation instead of the market to a certain extent, and the performance result is assets structure [1]. There are many studies on assets structure and enterprise value, but few scholars would consider the life cycle factor. In recent years, the literature to study the relationship between assets structure and enterprise value based on the perspective of life cycle was rarer.

Enterprises at different stages have differences in many aspects such as systems, strategic goals, and operating decisions. As a result, various types of assets have different characteristics at different stages of life cycle, and their impact on enterprise value is also different. In the 1990s, Czyzewski and Hicks found that the liquidity of assets had a promoting effect on enterprise value by using the return on net assets as the dependent variable and divided the samples into 8 groups according to their levels [2]. Later numerous scholars carried out a lot of research. For example, Tang and Wang found that there was a negative correlation between the liquidity of assets and the enterprise performance measured the traditional financial [3,4]. Xu confirmed that the company's development ability was affected by the assets structure [5]. With the continuous development of life cycle theory, Meng and Zhang performed regression analysis and found that the impact of assets structure on enterprise value was different at different stages [6].

Therefore, based on the data of listed companies in small and medium, we explored the relationship between assets structure and enterprise value by the multiple regression analysis and identified whether there were differences between the two under different stages of the life cycle.

2. Theoretical Analysis and Hypotheses

There are many types of enterprise assets with different characteristics, such as the current assets has the characteristics of high liquidity and low return, and the fixed assets can obtain benefits through production and operation. According to the Modern Portfolio Theory, companies could maximize their returns at a certain level of risk by diversifying internal resource allocation. According to the Resource-Based Theory, a reasonable proportion of various assets could increase the core competitiveness of the enterprise and enhance enterprise value. The research results of

numerous scholars also showed that there was a correlation between asset liquidity and enterprise value [7-11]. In addition, the enterprise life cycle theory believed that the company would go through several stages in the process of development and growth, and the internal and external environment would change continuously. At this time, the managers need to look at the problem with a "flexible and changeable" development perspective and make differentiated operating investment decisions when facing different market environments, enterprise systems, and strategic goals, which is also the core of contingency theory. In summary, we should manage the enterprise, make decisions and take action based on dynamic changes. Many scholars have also studied this issue. For example, Lu pointed out that the assets structure would be affected by the life cycle [12] and Meng proposed that the impact of the assets structure on enterprise value at each stage of life cycle stage has the relationship of linear function [6]. Moreover, Tan also conducted similar research [13].

Based on the above analysis and the four major theories, it can better explain the changes in operation and investment decisions at each stage of life cycle. For enterprises in the growth period, the production results occupy a certain share in the market, which can bring profits to enterprises to maintain their normal operation and development. At the same time, because of the qualification of securities market trading lead the company to broadened its financing channels, and the goal of further occupying the market, and holding a certain amount of cash and other current assets to prevent the rupture of the capital chain, which promotes the enterprise value. Enterprises entering the mature period after a period of time have better development opportunities, but the competition will also become very fierce and the growth rate will slow down. At this time, enterprises are in a situation of high and stable sales, resource input and asset structure tend to reasonable. If continue to purchase long-term assets such as equipment, it will lead to a low utilization efficiency of resources or a large amount of inventory accumulation, which will increase the overall operating risk. Moreover, the operating objective of this stage is to delay the arrival of the turbulent period and recession period, so the flexible current assets can reduce the risk of appeals and promote the development of the enterprise. After entering the turbulent period, the unpredictability of the production and operation of enterprises would lead to the unpredictability of resource allocation in this stage, resulting in that there is no significant correlation between asset structure and enterprise value. The recession period is the last phase of life cycle at the same time the external environment has changed dramatically. The lack of innovation capability leads to a decrease of market share and the continuous deterioration of the environment, and enterprises are faced with the risk of being eliminated at any time. However, cash distribution and R&D expenditure at this stage can maintain enterprise value, but more low-yielding current assets will reduce enterprise value. Basing on the above mentioned theoretical and empirical findings in the literature, the following hypotheses are proposed:

H1: The impact of assets structure on enterprise value varies at different stages of life cycle

3. Research Design

3.1. Data source and processing

The companies in the small and medium manufacturing industry were selected as research targets in this article and their financial data from 2014 to 2018 were used for analysis. In order to ensure the reliability of the results, the sample data was processed as follows: (1) The companies marked as ST were removed. (2) All continuous variables were winsorized by 1%. (3) Deleting the sample with the missing value. Finally, a total of 1962 samples data were obtained.

The financial data used in the study came from CSMAR database and the economic indicator data was collected and sorted through Sina finance and statistical yearbook. The data processing software such as Stata14.0 and Excel 2016 were used for the sample processing and regression analysis.

3.2. Variable definition

3.2.1. Dependent variable

A lot of scholars have studied enterprise value because it was an indicator concerned by investors and operators. Return on equity (ROE) [2, 14], return on assets (ROA) [14-15], and economic value added (EVA) [16] and Tobin Q value [6, 17] are often used as the indicator to measure enterprise value. Many indicators can only reflect the enterprise's past operating income. However, the Tobin Q value can not only reflect the enterprise's past operating results, but also reflect the enterprise's future profitability to a certain extent. Therefore, this study selected Tobin Q value (TBQ) as the dependent variable on the research basis of Lv, et al. [17].

3.2.2. Independent variable

Assets structure was the internal allocation result of capital in the enterprise and many scholars have done a lot of research on the indicators to measure assets structure. Based on the composition of assets, some studies take the ratio of current assets, the ratio of fixed assets and the ratio of intangible assets as the measurement indicators [7-11]. Based on the nature of assets, some studies take financial assets and operating assets as the measurement indicators. Combining the research of Yuan [7] and Zhang [9], this article studied assets structure based on assets liquidity and selected the current assets ratio (CA/TA) as an independent variable.

3.2.3. Control variables

There are many factors that affect the enterprise value. In addition to the assets structure studied in this article, the capital structure, the enterprise-scale, the governance structure and so on would also affect enterprise value. Therefore, based on the research of the previous studies [6,11,12], this article selected the assets-liability ratio (LEV), enterprise-scale (SIZE), ownership concentration (Shrcr1), and the ratio of independent directors (DIRE), economic indicators (JJZS) as the control variable. The specific definitions of the variables were shown in Table 1.

Table 1. Variable definition

Variable types	Variable name	Variable symbol	Variable definitions
Dependent variable	Enterprise value	TBQ	company market value/total assets
Independent variable	Current assets ratio	CA / TA	current assets/total assets
	Assets-liability ratio	LEV	total liabilities/total assets
	Enterprise scale	SIZE	Ln (total assets)
Control variables	Ownership concentration	Shrcr1	the number of shares held by the largest shareholder/the total number of shares held
	The ratio of independent directors	DIRE	number of independent directors/number of directors
	Economic indicator	JJZS	That year's GDP/ last year's GDP

3.3. Division of life cycle stages

Based on the Dickinson cash flow model and combining the characteristics of China's listed companies, this article combined the introduction period and the growth period into the growth period. Finally, life cycle was divided into four stages, as shown in Table 2.

Table 2. Division of life cycle

Indicators	Growth period		Mature period	Turbulent period			Recession period	
NOC	-	+	+	-	+	+	-	-
NIC	-	-	-	-	+	+	+	+
NFC	+	+	-	-	+	-	-	+

3.4. Model design

In order to verify whether there were differences in the impact of assets structure on enterprise value at different stages of life cycle, this study used the following model to perform grouping regression:

$$TBQ_i = \alpha + \beta_1 CA/TA_i + \beta_2 LEV_i + \beta_3 SIZE_i + \beta_4 Shrcr1_i + \beta_5 DIRE_i + \beta_6 JJZS_i + \delta$$

Where α is the intercept term, β_1 is the independent variable coefficient, β_{2-6} are the control variable coefficients, and δ is the residual error term.

4. Empirical Results and Analysis

4.1. Descriptive statistical analysis

A total of 1962 samples data were used in this study, and 1025 samples for the growth period, 676 samples for the mature period, 204 samples for the turbulent period and 57 samples for the recession period. Under the different stages of life cycle, the mean, extreme value and standard deviation of continuous variables were shown in Table 3.

Table 3. Descriptive statistical results. SD = standard deviation.

Stages		TBQ	CA/TA	LEV	SIZE	Shrcr1	DIRE
All sample	Mean	2.8924	0.5656	0.3548	21.8425	33.9189	0.3748
	SD	2.1399	0.1537	0.1767	0.8629	14.0021	0.0534
	Minimum	0.2976	0.0615	0.0091	19.1987	4.1500	0.2000
	Maximum	21.0232	0.9568	2.3940	25.9056	85.0400	0.6667
Growth period	Mean	2.7004	0.5566	0.3915	21.9692	33.0082	0.3737
	SD	1.9158	0.1569	0.1772	0.9069	13.1160	0.0520
	Minimum	0.2976	0.0615	0.0311	19.9027	4.1500	0.2000
	Maximum	13.5966	0.9568	2.3940	25.9056	85.0400	0.6250
Mature period	Mean	3.0783	0.5629	0.3188	21.7431	35.4710	0.3765
	SD	2.2655	0.1493	0.1659	0.7726	14.6612	0.0549
	Minimum	0.4098	0.1299	0.0091	19.2226	7.4100	0.2500
	Maximum	21.0232	0.9235	0.8407	24.6955	81.8500	0.6667
Turbulent period	Mean	3.2410	0.6026	0.2955	21.5826	33.2230	0.3755
	SD	2.6126	0.1453	0.1697	0.8475	15.0478	0.0571
	Minimum	0.2981	0.2532	0.0197	19.1987	9.4400	0.3333
	Maximum	19.6878	0.8886	0.7987	24.2936	81.1700	0.6667
Recession period	Mean	2.8933	0.6265	0.3331	21.6723	34.3774	0.3720
	SD	2.2580	0.1476	0.1707	0.7395	16.1823	0.0465
	Minimum	0.6776	0.2903	0.0174	20.3902	10.0200	0.3333
	Maximum	11.2072	0.8995	0.7085	23.5339	67.4200	0.5000

As can be seen from Table 3., the statistical analysis results of each variable at different stages of life cycle showed larger differences. The details were as follows.

Enterprise value showed an increasing trend from growth period to mature period, and the average value of the mature period was much higher than the all sample means, reflecting the characteristics of the rapid development of enterprise in the growth period. In the life cycle, the standard deviation of the turbulent period was the largest, reflecting the unpredictability of the enterprise operating conditions in this period. Enterprises in the turbulent period would continue to develop in the next stage if operating well and exit the industry if not operating well. However, after entering the recession period, enterprise value decreased again, which conformed to the characteristics of life cycle to a certain extent. The current assets ratio at each stage of life style was more than 0.5, accounting for a larger proportion of the total assets and continuously increasing at each stage. To a certain extent, it reflected that the increase of return was brought by the increase of market share from growth period to mature period and the fewer investment opportunities during the recession period led to increased retention. Other control variables also reflected the enterprise characteristics of each stage of life cycle to a certain extent.

4.2. Correlation analysis

The correlation analysis results of each variable were shown in Table 4.

Table 4. Correlation analysis

Variable	TBQ	CA/TA	LEV	SIZE	Shrcr1	DIRE	JJZS
TBQ	1						
CA/TA	0.154***	1					
LEV	-0.449***	-0.179***	1				
SIZE	-0.511***	-0.168***	0.477***	1			
Shrcr1	0.084***	0.072***	-0.047**	0.017	1		
DIRE	0.090***	0.007	-0.026	-0.049**	0.058**	1	
JJZS	-0.297***	0.056**	0	0.024	-0.021	-0.013	1

Note: *** indicates significance at level of 0.01; ** indicates significance at level of 0.05; * indicates significance at level of 0.10. The meaning of these symbols is the same in Table 5.

As can be seen from Table 4, the current assets ratio (CA/TA), ownership concentration (Shrcr1), and ratio of independent directors (DIRE), and enterprise value (TBQ) showed a significant positive correlation, while asset-liability levels (LEV), enterprise-scale (SIZE), and economic indicators (JJZS) were the opposite. Except for enterprise-scale (SIZE) and assets-liability ratio (LEV), the absolute value of correlation coefficients between other variables were all less than 0.3, indicating that the multicollinearity between variables was weak.

4.3. Analysis of regression results

In this article, Stata 14.0 was used for regression analysis on the sample data from four stages of life cycle. The analysis results were as follows.

Table 5. The regression results of the impact of asset structure on enterprise value under the different stage of life cycles

Period	Growth period		Mature period		Turbulent period		Recession period	
	Coef	T value	Coef	T value	Coef	T value	Coef	T value
CA/TA	0.7423**	2.49	1.0297**	2.18	0.8139	0.84	-2.5615*	-1.78
LEV	-2.9016***	-9.89	-3.6902***	-8.03	-2.8362***	-3.02	-3.9255**	-2.61
SIZE	-0.7708***	-13.38	-1.0414***	-10.60	-1.4948***	-7.72	-1.2966***	-3.83
Shrcr1	0.0101***	2.89	0.0183***	3.83	-0.0126	-1.41	0.0078	0.59
DIRE	1.5753*	1.79	2.9180**	2.31	0.3620	0.15	2.7826	0.62
JJZS	-41.7840***	-12.35	-49.3389***	-9.17	-57.6099***	-5.65	-58.6392***	-3.53
Constant term	64.8883**	16.97	78.2039**	12.41	98.8746***	8.35	96.5827***	5.35
Observations	1025		676		204		57	
R ²	0.4220		0.3805		0.4955		0.6152	

For the regression equation of each stage of life cycle, the F statistics were significant at the level of 1%, and the value of R² were higher than 0.3, showing that the regression results were meaningful and credible. According to the regression results shown in Table 5, there were differences in the impact of assets structure on enterprise value at different stages life cycle, and the regression coefficients were 0.7423, 1.0297, 0.8139, -2.5615 correspondings to the four stages of life cycle. The significance level of the growth period and the mature period was 5%, but the turbulent period was not significant, and the significance level of the recession period was 10%. The above statistical analysis results showed that the current assets ratio which was the indicator to measure assets structure and enterprise value showed a significant positive correlation in the growth period and the mature period, while the recession period was the opposite, and the turbulent period showed no significant correlation. Therefore, the hypothesis proposed in this study was verified.

Due to the implementation of the expansion strategy, enterprises need to hold a certain amount of current assets during the growth period and the mature period in order to prevent the rupture of the capital chain, reduce operating risks and promote the enterprise value. Due to the uncertainty and unpredictability of the future development of the enterprise in the turbulent period, the impact of the asset structure on enterprise value at this stage is not directional. Due to the implementation of contractionary strategy and the reduction of investment projects in the recession period, holding a

large amount of low-yielding current assets is not conducive to creating value.

5. Conclusion

There have been many types of research on the optimization of capital structure and asset structure. Based on a large number of previous researches, this article studied the impact of assets structure on enterprise value at different stages of life cycle. The empirical results showed that the impact of assets structure on enterprise value has a periodic character. To be specific, the stronger the liquidity of the assets during the growth period and the mature period the higher the enterprise value, however, it was opposite during the recession period and there was no obvious correlation during the turbulent period.

Based on the above conclusions, this article has the following enlightenment: the managers should use dynamic and changing thinking to make business decisions, adopt different current assets management systems at each stage of life cycle, and allocate resources according to the strategic objectives, which will eventually enhance the enterprise value. For example, during the growth period and the mature period, increase the holding of monetary capital and inventory, strengthen accounts receivable management, increase the proportion of current assets to prevent the rupture of the capital chain, and enhance the enterprise's ability to resist risks. During the recession period, increasing dividend distribution and R&D investment, and reducing the current assets of enterprises would promote the growth of enterprise value.

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