

Correlation between asset structure and enterprise growth ability of listed automobile companies in China

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Abstract. This research paper explores the impact of asset structure on the growth potential of listed automobile companies in China, given the critical role of the automotive industry in the country's economy and employment. The study uses a comprehensive index evaluation system to assess enterprise growth ability (GA) based on 17 evaluation indicators across six dimensions. The asset structure (AS) is evaluated based on total assets and current assets, and a multiple regression analysis is conducted to examine the relationship between asset structure (AS) and GA. The study finds that in the total asset structure (AS), the proportion of current assets is positively correlated with GA, while the proportion of fixed assets is negatively correlated. Intangible assets are slightly negatively correlated with current GA but positively correlated with future GA. In the current asset structure (AS), the proportion of monetary capital is positively correlated with GA, while the proportion of inventory is negatively correlated.

1 Introduction

Businesses play a significant role in the nation's economy and are the source of societal prosperity. Enterprise longevity will have a direct impact on social stability and economic growth. A growing amount of the nation's economic growth and employment is being stimulated by the automobile industry. Not only has the automobile industry greatly increased societal material prosperity, but it has also sped up the growth of numerous allied sectors. However, many businesses are currently experiencing a bankruptcy crisis. Why do some businesses survive and thrive amid intense competition while others fail in the setting of economic growth?

The growth ability (GA) of businesses is influenced by a wide range of intricate aspects. The level of market rivalry, the macroeconomic environment, industrial policy, etc., are some examples of external influences. Internal elements like resource distribution, managerial aptitude, and business governance are also crucial. Among these factors, the assets of the corporation are the main factors having a great influence on the survival and prospect of a company [1]. The asset structure (noted as AS), may help business increase production efficiency and improve risk resistance.

In this study, we analyze how AS affects firms' GA using the empirical research methodology. How can businesses optimize their AS, enhance their GA, and achieve steady, long-term growth?

2 Literature review

The major emphasis of many academic studies on AS is how AS affects business performance. There are several

studies on the impact of various assets, particularly intangible assets, on the success of businesses. According to some academics [2], intangible assets can help a corporation perform better over time. Intangible asset management must be done on a case-by-case basis since it is also thought that the function of intangible assets differs across different functional corporation sectors [3].

Additionally, some academics have looked into an enterprise's capital structure, asset details, and asset increase. The effects of fixed AS on firm earnings will vary according on the industry [4]. According to Chen et al. [5], the details of assets of the fixed and intangible assets may significantly affect an organization's performance. The future returns of listed businesses are also significantly predictable by the expansion of asset investment [6]. In summary, the pertinent study demonstrates that suitable AS may help businesses operate better [7, 8].

The study of enterprise growth ability(GA) can be divided into two main areas. The first area concerns the definition and meaning of GA, while the second area focuses on the factors that influence GA and how it can be evaluated. The factors influencing enterprise GA can be categorized as either internal or external factors. External factors are related to the institutional background of the enterprise, including industrial rules, economy environment, regulations, market environment, and others [9, 10].

Internal factors affecting enterprise growth are primarily at the company level and include financial operations, governance framework, management standards, and R&D investment capacity, among others [11]. Although there is limited literature on the relationship between accounting standards (AS) and

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enterprise growth, some studies suggest that an enterprise's cash holdings have a positive correlation with growth [7]. Government subsidies also have a significantly positive correlation with the growth of new enterprises. Furthermore, maintaining a healthy current ratio, cash flow, and workforce capital, as well as considering the age of the enterprise, are vital factors for maintaining growth [6].

Although many studies have investigated AS, few have explored their relationship with enterprise growth. Most AS research seeks to identify the factors that influence them, while research on enterprise growth has mainly focused on evaluating growth rather than improving it through AS optimization. Thus, this paper aims to examine the link between AS and enterprise growth for listed automobile manufacturing industry in China and proposes ways to enhance enterprise GA by optimizing AS.

3 Hypothesis

Fixed assets serve as the foundation of growth and success of a company, it is crucial for enterprises to minimize costs and maintain a proper percentage of fixed assets. Previous studies have shown that corporate performance in British companies is closely correlated with their level of fixed assets [4]. However, other scholars have argued that the capital structure of a company has a damaging effect on its performance [3]. The percentage of current assets in a company's AS is also a significant factor that affects its performance. The higher the percentage of current assets, the better the company's risk tolerance and solvency, although excessive current assets may affect profitability. In the mature automobile manufacturing industry, overcapacity and declining sales pose significant commercial risks. Therefore, a high percentage of current assets can enhance the capability to repay debts and withstand risks of a company. In contrast, investing in fixed assets that remain idle or operate inefficiently can hinder enterprise production and operations, potentially impacting their development.

Hypothesis 1a. The percentage of current assets and the GA has positive relationships.

Hypothesis 1b. The percentage of fixed assets and the GA has negative relationships.

Hypothesis 1c. The percentage of fixed assets out of current assets has negative relationships.

Intangible assets, known as intellectual capital of a company and the reflection of their innovative abilities, have an important impact on enterprise performance. The percentage of intangible assets in AS can reveal the level of a company's high technology innovation and product competitiveness. According to Falk [11], R&D investment intensity has a great positive impact on enterprise growth. For most of automobile manufacturing companies, intangible assets are crucial to improve product competitiveness, but the quota of intangible assets among Chinese listed corporations is low. Over-investment in the cost of intangible assets can also affect

current operating outputs, but in the long run, a higher proportion of intangible assets can benefit enterprise growth.

Hypothesis 2a. The proportion of intangible assets will have a negative impact on the GA of enterprises in the current period

Hypothesis 2b. The proportion of intangible assets will have a positive related to the GA of enterprises in the future period.

Monetary capital, accounts receivable, and inventory management are crucial components of current assets for enterprises. A higher proportion of monetary capital ensures a stronger payment ability and reduces financial risks. Meanwhile, accounts receivable represent credit sales and are important for expanding sales in competitive markets. Efficient inventory management is also crucial for reducing capital occupation and promoting corporations development healthily. In the automobile manufacturing industry, working capital is necessary for normal operations, but the increasing proportion of accounts receivable and decreasing turnover rate over the years have negatively impacted enterprise GA. Currently, because of the low economic degree of automobile manufacturing, manufacturers and dealers are removing inventory to reduce this issue.

Hypothesis 3a. A higher proportion of capital funds is associated with a higher GA of corporations.

Hypothesis 3b. A higher proportion of accounts receivable is associated with a lower GA of corporations.

Hypothesis 3c. A higher proportion of innovation is associated with a lower GA of companies.

4 Method

4.1 Data and sample

To ensure the reliability of the conclusions drawn, this study focused on 75 auto manufacturers listed in Shenzhen and Shanghai Stock markets prior to 2015. Using publicly available accounting reports of these enterprises during the period of 2015-2020, all of 495 observations were gained after excluding ST, PT and SST corporations, as well as those with uncompleted data.

4.2 Variable design and measurement

4.2.1 Dependent variables

The authors constructed a GA evaluation system with 17 important indicators, based on the results of many scholars who have evaluated enterprise GA. The system consists of six categories, including profitability, operation ability, risk coping ability, market growth ability, innovation ability, and human capital. Each index selected represents a specific aspect of GA, but the entire system covers most factors that could influence an enterprise's GA. A detailed definition of the evaluation index can be found in Table 1.

Table 1. Enterprise GA evaluation index.

Characteristics	Variable name	Symbol	Descriptions
Profitability	Return on assets	A_1	$\frac{\text{Total profit} + \text{Financial expenses}}{\text{Total assets}}$
	Operating profit ratio	A_2	$\text{Total profit}/\text{Operating income}$
	Net assets returns ratio	A_3	$\text{Net profit}/\text{Stockholder's equity}$
	Ratio of profits to cost	A_4	$\text{Total profit}/\text{Total cost}$
Operation	Total asset turnover ratio	B_1	$\text{Operating income}/\text{Total assets}$
	Current assets turnover ratio	B_2	$\text{Operating income}/\text{Current assets}$
Risk response	The inverse of asset-liability ratio	C_1	$\text{Total assets}/\text{Total Liability}$
	current ratio	C_2	$\text{Current assets}/\text{Current liabilities}$
	cash ratio	C_3	$\text{Cash and cash equivalents closing balance}/\text{Current liabilities}$
Market growth	Growth rate of capital preservation	D_1	$\frac{\text{Closing balance of owner's equity}}{\text{Opening balance of owner's equity}}$
	Total assets growth rate	D_2	$\frac{\text{Closing balance of total assets} - \text{Opening balance of total assets}}{\text{Total assets in initial period}}$
	Net profit growth rate	D_3	$\frac{\text{Net profit of current term} - \text{Net profit of last period}}{\text{Net profit of last period}}$
	Revenue growth rate	D_4	$\frac{\text{Operating income of current term} - \text{Operating income of last period}}{\text{Operating income of last period}}$
Innovation	Proportion of R&D personnel	E_1	$\text{R\&D employees}/\text{Total employees}$
	Proportion of R&D investment	E_2	$\text{R\&D investment}/\text{Operating income}$
Human capital	Mean total labor productivity	F_1	$\text{Operating income}/\text{Total employees}$
	Return on labor input	F_2	$\text{Net profit}/\text{Total employee compensation and benefits}$

Enterprise growth ability GA

Table 3. Control variables.

Variable name	Symbol	Descriptions
Enterprise size	Size	Logarithm of total assets
Asset-liability ratio	Lev	Total liabilities/Total assets
Ownership concentration	Own	Number of shares held by top ten stockholders/Total number of shares
Enterprise age	Age	The observed year of money funds minus the year of listing plus 1 take the logarithm
Particular year	Year	Natural year

4.2.2 Independent variables

The categorization of assets into current and non-current is based on liquidity and is widely used. The AS variables used in this study are based on previous research conducted by Gibb [9], Hu et al. [10], and Falk [11], as shown in Table 2.

Table 2. The independent variables of asset structure.

Variable name	Symbol	Descriptions
Proportion of current assets	Cur	$\text{Current assets}/\text{Total assets}$
Proportion of fixed assets	Fix	$\text{Fixed assets}/\text{Total assets}$
Fixed-current ratio	Flr	$\text{Fixed assets}/\text{Current assets}$
Proportion of intangible assets	Int	$\text{Intangible assets}/\text{Total assets}$
Proportion of monetary found	Cash	$\text{Money funds}/\text{Current assets}$
Proportion of accounts receivable	Rec	$\text{Accounts receivable}/\text{Current assets}$
Proportion of inventory	Inv	$\text{Inventory}/\text{Current assets}$

4.2.3 Control variables

The study incorporates control variables into the model to account for other factors that may impact the independent variables. Specifically, this paper considers asset size, asset-liability ratio, equity concentration, enterprise age, and year as control variables [3]. The definitions of these control variables are presented in Table 3.

According to the theoretical analysis presented earlier, the assets structure (AS) of auto manufacturers may have an impact on their growth ability (GA). In order to test this hypothesis, a model was constructed to examine the relationship between AS and GA.

$$GA = a_0 + a_1 STR_1 + \sum_{k=1}^4 a_k Contrls_k + \varepsilon \quad (1)$$

To test the hypothesis that AS affects the GA of automobile manufacturing enterprises, the model includes GA as the dependent variable, and STR_i (i=1,2,3,4,5,6,7) as the independent variable to represent the structure of AS. The structure is measured by the percentage of current assets (Cur), fixed asset proportion (Fix), solid current ratio (Flr), and intangible asset percentage (Int). The total AS is evaluated by the percentage of monetary funds (Cash), accounts receivable (Rec), and inventory (Inv). Control variables include asset-liability ratio (Lev), equity concentration (Own), size, enterprise age (Age), and ε represents the residual value.

The proportion of intangible assets is a crucial factor for enterprises, but it has been observed that the percentage of intangible assets in traded companies in

China is generally low. This is because economies of scale for intangible assets have not yet been established, making it challenging for them to function in an efficient way. Moreover, investing too much money in intellectual property may also affect the operating results in the present period. However, in the long time, an increase in the percentage of intangible assets can contribute significantly to the GA of enterprises. The mathematical model used to test this hypothesis is presented below:

$$GA_t = b_0 + b_1 Int_t + \sum_{k=1}^4 b_k Controls_k + \varepsilon \quad (2)$$

$$GA_{t+1} = b_0 + b_1 Int_t + \sum_{k=1}^4 b_k Controls_k + \varepsilon \quad (3)$$

To examine the influence of the percentage of intangible assets on the GA of auto manufacturers, a regression model is constructed. The regression coefficient b and error terms ε are estimated, and the fiscal year t is included as a control variable. Other control variables, including size, asset-liability ratio (Lev), enterprise age (Age), and equity concentration (Own) are also included in the model.

5 Empirical results

5.1 Descriptive statistics

This study conducted a descriptive statistical analysis of all the samples selected (see Table 4) to investigate the situation of AS variables and GA of listed corporations in China's auto manufacturers. The results indicate that current assets account for a significant portion of total assets, with an average value of 0.589. The average percentage of fixed assets is 0.214, and the fixed-current ratio is 0.414 on average, which is contradictory to the characteristics of the auto manufacturers. Moreover, the average proportion of intangible assets in total assets is 0.048, which indicates that most companies in the industry have not paid enough attention to the significance of intangible asset investment.

In terms of current assets, the average proportion of monetary funds (Cash) is 0.242, and the percentage of accounts receivable (Rec) is 0.378, which is higher than the proportion of inventory assets (Inv) in current assets. The overall growth ability of listed companies of China's auto manufacturers is at a low level, with an average GA of 0, and a standard deviation of 0.467, indicating that the level of GA among corporations in the industry is uneven.

Table 4. Descriptive statistics.

Variable	Sample					
	N	Mean value	Median	Standard deviation	Minimum value	Maximum value
Cur	495	0.589	0.581	0.143	0.204	0.950
Fix	495	0.214	0.207	0.098	0.007	0.549
Flr	495	0.414	0.352	0.283	0.008	2.144
Int	495	0.048	0.037	0.044	0.000	0.410
Cash	495	0.242	0.209	0.155	0.007	0.859
Rec	495	0.378	0.377	0.167	0.000	0.835
Inv	495	0.230	0.207	0.128	0.009	0.869
Lev	495	0.492	0.492	0.189	0.063	0.982
Size	495	22.483	22.240	1.364	19.732	27.307
Own	495	0.594	0.599	0.152	0.190	0.940
Age	495	2.261	2.565	0.761	0.000	3.258
GA	495	0.000	-0.027	0.467	-2.635	3.682

5.2 Regression results

Regression analysis was conducted to test the assumptions of this study using the explanatory variables

Cur, Fix, Flr, Int, Cash, Rec, and Inv, and the industry growth capacity (GA) as the dependent variable. The results of the regression analysis are presented in Table 5.

Table 5. Regression results.

Variable	Model (1-1)						
	GA	GA	GA	GA	GA	GA	GA
Cur	0.787***						
	(4.26)						
Fix		-4.90**					
		(-2.05)					
Flr			-0.235***				
			(-3.20)				
Int				-0.168			
				(-0.41)			

Cash					0.448**		
					(2.12)		
Rec						0.185	
						(1.25)	
Inv							-0.631***
							(-2.57)
Lev	-1.643***	-1.477***	-1.490***	-1.478***	-1.315***	-1.496***	-1.400***
	(-9.70)	(-9.32)	(-9.41)	(-9.16)	(-8.07)	(-9.37)	(-8.95)
Size	0.144***	0.121***	0.122***	0.122***	0.113***	0.123***	0.109***
	(7.50)	(6.70)	(6.84)	(6.81)	(5.96)	(6.87)	(6.27)
Own	0.125	0.260**	0.278**	0.292**	0.296**	0.292**	0.349**
	(1.63)	(1.97)	(2.05)	(2.17)	(2.11)	(2.03)	(2.49)
Age	0.045	0.040	0.040	0.064	0.042	0.064***	0.048
	(1.55)	(1.43)	(1.40)	(2.17)	(1.32)	(2.18)	(1.56)
Year	Control	Control	Control	Control	Control	Control	Control
C	-2.873***	-1.865***	-1.912***	-2.051***	-2.024***	-2.131***	-1.658***
	(-6.84)	(-5.25)	(-5.57)	(-4.23)	(-5.84)	(-6.00)	(-4.60)
F	12.81***	11.40***	11.26***	10.69***	11.09***	11.49***	12.24***
Adjusted R ²	0.415	0.373	0.382	0.364	0.381	0.368	0.391

Table 5 displays the regression results using Cur, Fix, Flr, Int, Cash, Rec, and Inv as explanatory variables and the growth ability (GA) of corporations in the auto manufactures as the dependent variable. The adjusted R2 values of the models range from 0.364 to 0.415, indicating a significant linear relationship between the dependent and independent variables, and the overall model fitting is good. Additionally, the F statistic value for model (1-2) has passed the significance test, showing that both the explanatory and control variables can better indicate the change in the growth ability of companies.

Based on the regression results, a higher proportion of current assets (Cur) has a positive impact on the growth ability of companies, as indicated by the significant coefficient value of 0.787, passing the significance test at the 1% level. The excessive proportion of fixed assets (Fix) in the asset structure is negatively correlated with the growth ability of companies, with a significant coefficient of -0.40 at the 5% significance level, verifying hypothesis H1b. A high solid current ratio (Flr) has a negative impact on growth ability, as evidenced by the significant coefficient of -0.235, passing the significance test at the 1% level and supporting hypothesis H1c. However, the proportion of intangible assets (Int) is not significantly related to the growth ability of the current period, as indicated by the non-significant coefficient of -0.168, failing to verify hypothesis H2a. A higher proportion of cash in the internal structure of current assets (Cash) can significantly improve the growth ability of companies, as evidenced by the significant coefficient of 0.448 at the 5% significance level, supporting hypothesis H3a. An excessive inventory ratio in the current AS (Inv) will harm

the growth ability of companies, with a significant coefficient of -0.631 at the 1% significance level, verifying hypothesis H3c. Additionally, Size and Own are significantly positively correlated with enterprise GA, while Lev is significantly negatively correlated with enterprise GA.

To further test the assumption that the percentage of intangible assets (Int) has a positive impact on the growth ability of companies in the coming period, models (1-2) and (1-3) are utilized, and the regression results are presented in Table 6.

Table 6. The lag effect of intangible assets.

Variable	Model (1-2)	Model (1-3)
	GA _t	GA _{t-1}
Int	-0.201 (-0.35)	1.704*** (2.96)
Lev	-1.727*** (-8.75)	-1.620*** (-7.55)
Size	0.311*** (5.70)	0.373*** (6.61)
Own	0.271 (0.99)	0.353 (1.29)
Age	0.118 (1.59)	0.266** (2.37)
Year	Control	Control

C	-6.181*** (-5.51)	-8.261*** (-7.19)
F	17.24***	16.71***
Adjusted R^2	0.364	0.331

The regression results in Table 6 show that in Model (1-2), there is a weak negative correlation between the current period's Int and the current period's GA (GA_t) of enterprises, with a coefficient of -0.212. However, in Model (1-3), the lagged Int coefficient is 1.706, indicating a noteworthy positive correlation between the intangible assets invested in the previous period and the GA of companies in the next period (GA_(t+1)). This suggests that investments in intangible assets in the prior period have a positive influence on the improvement of growth ability in the present period. The low overall investment size of intangible assets in the industry may have prevented the generation of significant scale benefits. Therefore, hypothesis H2b has been confirmed.

6 Conclusion

The study conducted a multiple regression analysis on panel data of listed auto manufacturers corporations from 2015 to 2020 to investigate the correlation between asset structure (AS) and enterprise growth ability (GA). The results show a linear relationship between the two variables, where a higher percentage of current assets is apparently positively correlated with the GA of enterprises. This suggests that in the current severe domestic and international context, mitigating debt risk and enhancing asset liquidity are crucial factors for the growth ability of listed auto manufacturers in China. Conversely, a higher proportion of fixed assets is significantly negatively correlated with the GA of enterprises, indicating that the pursuit of fixed asset investment is not conducive to improving the GA of enterprises. The proportion of intangible assets in total assets is negatively related to the GA of the present period but positively related to the GA of the coming period, implying that in the long term, intangible assets play a crucial role in enhancing the GA of companies. Therefore, it is suggested that companies optimize their AS and utilize resources effectively to improve the level of enterprise GA.

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