

# Research on financial asset allocation behavior of manufacturing enterprises

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**Keywords:** manufacturing enterprises, financial assets, motivation of fund reserving, motivation of capital arbitraging.

**Abstract:** This paper selects the quarterly data of manufacturing listed companies from 2007 to 2020 as the research sample, and uses the panel regression model to study. The results show that the level of financial asset allocation of enterprises is significantly positively correlated to the GDP, the growth rate of stock index and the growth rate of bond index, and the level of financial asset allocation is significantly negatively correlated with M2, which indicates that enterprises allocate financial assets because of motivation of capital arbitraging. Financial assets of enterprises do not play the role of liquidity management, on the contrary, become a means for managers to seek short-term and high returns.

## 1. Introduction

Manufacturing industry is the main body of national economy. In 2020, the Central Committee mentioned in the 14th five-year-plan that we should focus on the entity economy and keep the proportion of manufacturing industry stable. However, in recent years, with China's economy entering the structural transformation period, the real economy is generally facing many difficulties. However, the fierce development of the real estate industry and the financial industry has induced a large number of manufacturing industries to "turn from real to virtual", and the total amount of financial assets held by manufacturing enterprises has increased year by year. So, what is the motivation of listed manufacturing companies to allocate financial assets?

## 2. Literature review

Based on the research and analysis of monetary demand theory, financing restriction theory and agency theory, the motivation of non-financial enterprises to allocate financial assets can be divided into two categories: motivation of fund reserving, motivation of capital arbitraging.

With regard to the motivation of fund reserving, Tornell (1990) believes that entity enterprises may be more willing to invest in the financial sector due to the uncertain environment in developing countries. Opler et al. (1999) think that enterprises will reserve cash and short-term financial assets in order to reduce the negative impact of capital chain rupture on production and operation activities. Yiming Hu et al. (2017) empirically conclude that enterprises mainly allocate financial assets to prevent capital shortage. Lu Deng et al. (2020) point out that financial assets are regarded as important reserves to prevent macroeconomic shocks, and reasonable allocation of financial assets is an important means to revitalize the stock fund and increase liquidity, which is conducive to stabilizing the company's income and reducing the company's financing cost.

With regard to the motivation of capital arbitraging, Lakshman (2012) mention that the rising rate of return on financial investment and the increasing preference of managers for short-term interests will promote the entity enterprises to participate in financial market arbitrage. Yong Du et al. (2017) believe that managers prefer to allocate financial assets for speculative arbitrage in order to obtain short-term excess return when the rate of return on financial investment is far greater than the rate of return on entity investment, and ignore the real investment conducive to the long-term development of enterprises. Leilei Gu et al. (2020) found that managers are faced with external pressure to improve the rate of return of shareholders and repay corporate debt, as well as internal pressure of salary

assessment and job promotion in the general environment of continuous downturn of the real economy, so short sighted managers will choose to allocate more high-yield financial assets to promote corporate performance at least in the short term.

To sum up, there are two kinds of motives for enterprises to allocate financial assets: one is motivation of fund reserving, the other is the motivation of capital arbitraging. However, the research samples of scholars are basically non-financial enterprises, so what is the motivation of Chinese manufacturing listed companies to allocate financial assets? In order to study this problem, this paper uses the panel data of manufacturing industry from 2007 to 2020 to investigate the changes of the scale of financial assets allocation of manufacturing enterprises under the change of macroeconomic environment.

### **3. Research hypothesis**

#### **3.1 Economic development and financial asset allocation**

Ding et al. (2013) point out that there is a phenomenon of "financial constraint" in the Chinese market, which distorts the capital allocation mechanism and reduces the investment efficiency of enterprises. Therefore, when the economic development speed is very fast, non-financial enterprises will adjust their holdings of financial assets in order to reduce the impact of financial constraint on their own development. Based on the motivation of fund reserving, the real investment opportunities increase and the uncertainty decreases when the economy rises, and enterprises will increase entity investment and reduce the allocation of financial assets. When the economy goes down, the situation is opposite when the prospect is not clear.

However, based on the motivation of capital arbitraging, when the economy goes up, the investment risk of financial assets is relatively small, and the expected rate of return rises, so enterprises increase the allocation of financial assets according to the principle of "risk-return". On the contrary, the economic downturn and risk of investment increase, enterprises reduce the allocation of financial assets. In this paper, GDP is used to express economic development.

#### **3.2 Monetary liquidity and financial asset allocation**

When M2 is high (low), it usually means the monetary environment is loose (tight), and the degree of financing constraints is low (high). Based on the motivation of fund reserving, when M2 is high, enterprises will allocate more cash assets, or increase their holdings of short-term financial assets for strong liquidity. When M2 is low, monetary liquidity is tight and capital acquisition is difficult, enterprises hold less cash and reduce financial assets to obtain liquidity. However, based on the motivation of capital arbitraging, when M2 is high, market liquidity is ample, financial asset pricing may be high, or even bubble appears, and financial risks will increase, so enterprises will reduce financial assets. On the contrary, when M2 is low and financial assets risks decrease, enterprises will increase their scale. In this paper, M2 is used to represent the monetary liquidity.

#### **3.3 Capital market and financial asset allocation**

First, when the stock market is in the upward stage, based on the motivation of fund reserving, the enterprise will sell the shares held by the company to obtain liquidity, and invest the obtained capital in the entity. However, based on the motivation of capital arbitraging, managers prefer to allocate more financial assets for speculative arbitrage in order to obtain short-term excess return, and ignore the entity investment that is conducive to the long-term development of enterprises. On the contrary, when the stock market is in the downward stage, the financial asset allocation behavior of enterprises is just the opposite. In this paper, the growth rate of stock index is used to express the stock market.

Second, if the bond market price rises, based on the motivation of fund reserving the enterprise will sell the bonds held by the company to obtain liquidity, and invest the gained funds in the entity. However, based on the motivation of capital arbitraging, the enterprise will maintain or increase the holding of bonds to get investment income. This paper uses the growth rate of bond index to express the bond market.

To sum up, this paper assumes that enterprises allocate financial assets for arbitraging capital, and puts forward hypothesis H1-4.

H1: under the motivation of capital arbitraging, GDP has a positive correlation with the level of financial asset allocation;

H2: under the motivation of capital arbitraging, M2 has a negatively correlated with the level of financial asset allocation;

H3: under the motivation of capital arbitraging, the growth rate of stock index is positive correlation with the level of financial asset allocation;

H4: under the motivation of capital arbitraging, the growth rate of bond index is positively correlated with the level of financial asset allocation.

## 4. Research design

### 4.1 Sample selection and data sources

The sample of this paper is the quarterly data of listed companies in Shanghai and Shenzhen A-share manufacturing industry from 2007 to 2020. The screening principles are as follows: (1) the enterprises established after 2007 are eliminated to ensure the continuity of data; (2) ST enterprises are eliminated; (3) enterprises with data missing are eliminated. In order to eliminate the influence of extreme value, this paper winsorize all continuous variables on 1% and 99% quantile, and finally get 33220 enterprise-year samples. All data in this paper are from CSMAR database.

### 4.2 Research model and variable definition

In order to test the hypothesis, the following panel regression models are constructed:

$$Finasset_{it} = \alpha_0 + \sum \beta Macroecos_{it} + \sum \varphi Controls_{it} + \lambda_i + \gamma_t + \mu_{it}$$

The explained variable *Finasset* represents the level of financial asset allocation, *Macroecos* represent four macroeconomic variables, *Controls* represent the control variable group. The subscript *i* expresses the enterprise, *t* expresses the year,  $\lambda_i$  and  $\gamma_t$  respectively represent individual fixed effect and year fixed effect,  $\mu_{it}$  is the residual.

Explained variable: referring to Leilei Gu et al. (2020), *Finasset* uses the ratio of financial assets to total assets. The measurement of financial assets is calculated by the following formula: financial assets = monetary capital+ trading financial assets + derivative financial assets + net repurchase financial assets + net available for sale financial assets + net held to maturity investment + net investment in real estate + net long-term equity investment + other current assets + non current assets due within one year + other non current assets + other net receivables.

Explanatory variables: there are four macroeconomic variables: GDP, M2, Stock and Bond. Where GDP and M2 are logarithmic, the growth rate of stock index (Stock) is the average growth rate of Shanghai composite index and Shenzhen composite index, and the growth rate of bond index (Bond) is the average growth rate of Shanghai national debt index and Shanghai corporate bond index.

In addition, according to the practice of Yiming Hu et al. (2017) and Haizhou Yan et al. (2018), the following eight variables are selected as the control variables: asset liability ratio (*Lev*), total asset size (*Size*), Tobin's Q value (*Q*), total asset turnover (*Turnover*), independent director ratio (*Idr*), top three executives' shareholding ratio (*Top3*), top three executives' salary ratio (*Pay3*), information of chairman and CEO appointing (*Dual*). And the logarithm of total assets is expressed as *size*, *dual* is 1 which means the chairman and CEO are the same person, while *dual* is 2 which means that the chairman and CEO are two persons.

## 5. Empirical results

### 5.1 Descriptive analysis

Table 1 is descriptive statistics. For *Finasset*, the maximum value is 0.97 and the minimum value

is 0.00, which indicates that some enterprises hold a higher proportion of financial assets, while others hold a lower proportion. In financial indicators, for example the highest Q value is 26.63, the lowest Q value is 0.15, and the standard deviation of it is 1.5, which indicates that there are great differences in investment opportunities or future growth between different enterprises. In corporate governance indicators, for example, the highest Idr is 0.09, the lowest Idr is 0.80 and the standard deviation of it is 0.06, which indicates that there is little difference in the proportion of independent directors among different enterprises.

Table 1 Descriptive Statistics of Variables

Variable	Obs	Mean	Std.Dev.	Min	Max
Finasset	33,220	0.27	0.15	0.00	0.97
GDP	33,220	11.87	0.42	10.95	12.54
M2	33,220	14.27	5.14	8.00	29.30
Stock	33,220	0.01	0.15	-0.32	0.57
Bond	33,220	1.11	1.17	-1.97	5.36
Q	33,220	2.10	1.50	0.15	26.63
Lev	33,220	0.49	0.21	0.02	3.66
Size	33,220	22.25	1.30	16.22	27.47
Turnover	33,220	0.46	0.41	0.00	7.61
Idr	33,220	0.37	0.06	0.09	0.80
Dual	33,220	1.84	0.36	1.00	2.00
Top3	33,220	0.45	0.15	0.08	0.93
Pay3	33,220	0.43	0.13	0.09	1.00

## 5.2 Correlation analysis

In order to preliminarily test the correlation between the explained variables and the explanatory variables, the correlation analysis is carried out, and the results are shown in Table 2. It can be seen from table 2 that the level of financial asset allocation is positively correlated with GDP, Stock and Bond, negatively correlated with M2, and all of which have passed the significance test. However, there is a certain degree of correlation between explanatory variables, so in the following empirical regression analysis, we will verify the influence of explanatory variables on the explained variables one by one. In addition, each control variable basically has significant correlation with the explained variable, but the control variables are not listed due to space limitation.

Table 2 Correlation Coefficient of Variables

	Finasset	GDP	M2	Stock	Bond
Finasset	1				
GDP	0.119***	1			
M2	-0.087***	-0.777***	1		
Stock	0.014**	0.051***	0.126***	1	
Bond	0.006**	0.132***	-0.021***	-0.086***	1

Note: \*\*\*, \*\*, and \* are significant at 1%, 5%, and 10% confidence levels, respectively.

## 5.3 Regression analysis

Table 3 reports the change of financial asset allocation level of manufacturing enterprises in the external economic environment during the sample period of 2007-2020.

First, from the results of models (1) and (2), GDP is significantly positively correlated with the level of financial asset allocation. This shows that when GDP rises, the proportion of financial assets of enterprises increase, which means that the enterprises do not increase the investment in the real operation, but prefer to allocate more financial assets because the investment risk of financial assets decreases and the expected return rate increases. So hypothesis1 is established.

Second, from the results of models (3) and (4), broad money M2 has a significant negative

correlation with the level of financial asset allocation. This shows that, during the sample period, when the broad money M2 increases, the proportion of financial assets of enterprises decreases, which means that the allocation level of financial assets of enterprises shows the opposite trend with M2 variable, and financial assets do not act as liquidity tools. So hypothesis2 is established.

Third, from the results of model (5) and (6), stock index growth rate is significantly positively correlated with the level of financial asset allocation. The growth rate of the stock index represents the rise and fall of the capital market. The high growth rate indicates that the stock price rises more. The managers increase the allocation of financial assets out of the motivation of capital arbitrage. So hypothesis3 is established.

Fourth, from the results of model (7) and (8), bond index growth rate is significantly positively correlated with the level of financial asset allocation. This shows that the bond market price rises, and based on motivation of capital arbitraging, enterprises will maintain or increase their bond holdings to obtain investment income and increase the allocation of financial assets. So hypothesis4 is established.

To sum up, the regression analysis results show that in the study period, manufacturing enterprises hold financial assets for the purpose of short-term high returns, rather than for the purpose of preventing insufficient liquidity.

Table 3 Regression Analysis

Finasset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	0.0305*** [0.0035]	0.0382*** [0.0036]						
M2			-0.0074*** [0.0008]	-0.0093*** [0.0009]				
Stock					0.466*** [0.0530]	0.584*** [0.0555]		
Bond							4.065*** [0.4621]	5.091*** [0.4835]
Q		0.0048*** [0.0005]		0.0048*** [0.0005]		0.0048*** [0.0005]		0.0048*** [0.0005]
Lev		-0.147*** [0.0038]		-0.147*** [0.0038]		-0.147*** [0.0038]		-0.147*** [0.0038]
Size		-0.0076*** [0.0012]		-0.0076*** [0.0012]		-0.0076*** [0.0012]		-0.0076*** [0.0012]
Turnover		-0.0319*** [0.0023]		-0.0319*** [0.0023]		-0.0319*** [0.0023]		-0.0319*** [0.0023]
Idr		0.0271* [0.0131]		0.0271* [0.0131]		0.0271* [0.0131]		0.0271* [0.0131]
Dual		-0.0036 [0.0019]		-0.0036 [0.0019]		-0.0036 [0.0019]		-0.0036 [0.0019]
Top3		0.0316*** [0.0043]		0.0316*** [0.0043]		0.0316*** [0.0043]		0.0316*** [0.0043]
Pay3		-0.0175*** [0.0050]		-0.0175*** [0.0050]		-0.0175*** [0.0050]		-0.0175*** [0.0050]
cons	-0.0958* [0.0407]	0.0481 [0.0420]	0.366*** [0.0122]	0.626*** [0.0342]	0.250*** [0.0030]	0.482*** [0.0275]	0.244*** [0.0033]	0.474*** [0.0273]
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	33220	33220	33220	33220	33220	33220	33220	33220
R-sq	0.0553	0.1102	0.0553	0.1102	0.0553	0.1102	0.0553	0.1102

Note: \*\*\*, \*\*, and \* are significant at 1%, 5%, and 10% confidence levels, respectively.

## 5.4 Robustness test

Referring to the practice of Yiming Hu et al. (2017), this paper uses the logarithm of financial assets as Finasset index to test the robustness, and finds that the conclusion remains unchanged after regression. The regression results are shown in Table 4.

Table 4 Regression Analysis

Finasset	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
GDP	1.149*** [0.0222]	0.150*** [0.0157]						
M2			-0.278*** [0.0054]	-0.0363*** [0.0038]				
Stock					0.175*** [0.0034]	0.0229*** [0.0024]		
Bond							1.525*** [0.0295]	0.199*** [0.0208]
Q		0.0171*** [0.0023]		0.0171*** [0.0023]		0.0171*** [0.0023]		0.0171*** [0.0023]
Lev		-0.613*** [0.0165]		-0.613*** [0.0165]		-0.613*** [0.0165]		-0.613*** [0.0165]
Size		0.994*** [0.0052]		0.994*** [0.0052]		0.994*** [0.0052]		0.994*** [0.0052]
Turnover		-0.099*** [0.0100]		-0.099*** [0.0100]		-0.099*** [0.0100]		-0.099*** [0.0100]
Idr		0.0029 [0.0565]		0.0029 [0.0565]		0.0029 [0.0565]		0.0029 [0.0565]
Dual		-0.0168* [0.0081]		-0.0168* [0.0081]		-0.0168* [0.0081]		-0.0168* [0.0081]
Top3		0.0017*** [0.0002]		0.0017*** [0.0002]		0.0017*** [0.0002]		0.0017*** [0.0002]
Pay3		-0.0002 [0.0002]		-0.0002 [0.0002]		-0.0002 [0.0002]		-0.0002 [0.0002]
cons	7.195*** [0.2609]	-2.880*** [0.1813]	24.57*** [0.0776]	-0.609*** [0.1473]	20.24*** [0.0189]	-1.176*** [0.1182]	20.00*** [0.0213]	-1.207*** [0.1173]
Time effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	33220	33220	33220	33220	33220	33220	33220	33220
R-sq	0.4652	0.7714	0.4652	0.7714	0.4652	0.7714	0.4652	0.7714

Note: \*\*\*, \*\*, and \* are significant at 1%, 5%, and 10% confidence levels, respectively.

## 6. Conclusion

What is the motivation of listed manufacturing companies in China to allocate financial assets? On this issue, this paper selects the quarterly data of manufacturing listed companies from 2007 to 2014 as the research sample, and uses the panel regression model to study. It is found that enterprises allocate financial assets out of motivation of capital arbitraging. In the context of the continuous downturn of the entity economy, managers are faced with the external pressure of improving the rate of return of shareholders and repaying corporate debt, as well as the internal pressure of salary assessment and job promotion. Therefore, short-sighted managers will choose to allocate more high-yield financial assets, at least promote the improvement of corporate performance in the short term, so ignore the entity investment that is conducive to the long-term development of enterprises.

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