

Economic Cycles and Business Investment

An Empirical Investigation of Chinese Companies

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ABSTRACT

As the economy fluctuates in a regular cycle, this paper refers to previous research findings. It divides the economic cycle into three phases by controlling variables for firms' operating conditions, debt situation, and cash holdings to study the economic cycle's impact on the scale of business investment. The empirical results find that micro firms behave differently in different phases of the cycle. Finally, the paper gives suggestions for business and macroeconomic policy development based on the empirical results.

Keywords: *Business investment, Cash holding, Economic cycle.*

1. INTRODUCTION

With the growing emphasis on micro-foundations in macroeconomic research, the relationship between economic cycles and the behaviour of micro-entities has become an increasing concern for scholars in the macro field. The behaviour of any micro-subject takes place within a specific macroeconomic environment, and against the backdrop of economic cycle fluctuations, a firm's cash holdings, operating conditions and investment decisions are all affected.^[1] A company's investment strategy refers to the practical placement and recovery of cash flows it owns or controls for future economic benefit and competitive advantage based on its overall strategy, weighing risks and rewards based on an analysis of its environment and resources. The investment strategy is the core of a company's financial strategy and is key to the rational allocation of resources and the realisation of the company's strategy. Changes in the macroeconomic environment will have a significant impact on the company's investment strategy.^[2] Firstly, macroeconomic factors will impact the business costs. Secondly, government economic policies at different stages of the business cycle will impact the company's investment and financing environment, all of which will bring uncertainty to the company's cash flow.^[3]

Previous studies of investment theory have assumed the premise that the business environment in which a company operates is deterministic, but in practice, this condition is too rigorous. Economic cycles are an essential manifestation of macroeconomic uncertainty

and have an essential impact on investment activities.^[4] However, a large number of scholars have discussed the synergistic effect of economic cycles, and macro social aggregate investment, and not enough research on micro subjects, so this paper takes A-share listed companies as the subject of micro research to explore the relationship between economic cycles and investment behaviour.

2. DATA AND METHOD

2.1 Data

This paper selects the first quarter of 2000 to the second quarter of 2021 as the research interval and uses all A-share listed companies in China's Shanghai and Shenzhen markets as the research sample.^[5] The sample treated as follows: (1) excluding companies in the financial and insurance industries, as the cash flow of such companies is relatively extraordinary due to the characteristics of the industries; (2) excluding companies with financial abnormalities during the listing period, such as ST, which had financial abnormalities during the listing period. Such companies include ST and PT companies, companies with total assets less than 0, companies with gearing ratios less than or equal to 0, and companies with return on assets less than 0. These companies may be in financial crisis, and their investment behaviour differs significantly from that of standard profitable companies; (3) excluding companies with shareholders' equity less than or equal to 0; (4) excluding overseas-listed B shares, H shares and other

stocks, which are subject to influence and restrictions from overseas regulators, which may reduce or delay investment; (5) excluding companies belonging to the water, electricity and gas production and supply industry, as the market does not determine the output and prices of

these companies; and excluding missing data. A total of 152,274-panel counts were obtained after processing. The data applied in this paper are listed companies data from the CCER database and macro variables data from the National Bureau of Statistics of China.^[6]

Table 1. definition of each variables

	Variables	Definition
Explained variable	INV	The scale of asset expenditure is equal to the cash at the beginning of the period paid for the purchase and construction of fixed assets, intangible assets and other long-term assets / total assets
Explanatory variables	GDP	Annual GDP growth rate
	INC	If the economy is recovering, INC=1; otherwise, INC=0 (2000-2004)
Control variables	EXP	If the economy is expanding, EXP=1; otherwise, EXP=0 (2005-2008)
	CASH	Cash/ total asset
	ROA	Return on assets, equal to net profit after tax/total assets
	LEV	Asset-liability ratio, equal to the book value of liabilities/total assets book value
	SL	Current ratio, equal to current liabilities/total liabilities book value

Businesses' capital investment refers to expenditure on the acquisition of fixed assets such as buildings, machinery and equipment, which are a reflection of the expansion of business capacity, an act of investment that can contribute to an increase in aggregate social demand and drive high aggregate social supply.^[7]This investment is different from what refers to in economics, where investment in fixed assets and investment in inventory are referred to together as investment, but in accounting, inventory is considered a component of a company's working capital management. Therefore, in this discussion of a company's capital investments, only investment in fixed assets has been selected as a proxy variable. The focus is on investments and their increments related to actual production and operations; the explanatory variable equals the amount of investment in fixed assets/total assets at the beginning of the period.^[8]

This paper does not adopt the HP filtering method to extract economic cycles in the macroeconomic analysis. HP filtering introduces spurious dynamic relationships unrelated to the underlying data generation process and the sample values after Filtered are primarily different in the tails. The middle and also have spurious dynamic relationships.^[9] Some Chinese scholars, when measuring the economic cycle, treat the extracted part of the cycle that becomes larger than zero after the HP filtering process as an expansionary economic phase and vice versa as a contractionary phase, which is not reasonable. It is usual for the economy to rebound in the upward phase, and this cannot simply be considered the contractionary phase of the economic cycle, as this is when companies are still optimistic about the economic form.

2.2 Method

The acceleration model is a model that describes changes in investment caused by changes in income or changes in consumer demand, which indicates that investment spending is proportional to changes in output and is not affected by the cost of capital. The acceleration

model has three main implications: (1) Net investment is a function of the amount of change in output rather than a function of the absolute amount of output. (2) The change in investment is more significant than the change in output. (3) In order for the investment to keep growing, the output must maintain a specific growth rate; if the level of output remains constant or falls, the level of investment must fall.^[10] In Western macroeconomics, the acceleration model has an important place, as it can be combined with the multiplier model to explain the causes of economic cycles. The acceleration model is also more operational than the two models mentioned above. At the same time, the acceleration model emphasises the impact of short-term growth opportunities on firms' investment behaviour. In contrast, this paper argues that a critical transmission mechanism through which the economic cycle affects firms is their profitability, which changes their investment incentives and behaviour. This paper, therefore, uses the acceleration model as the base model in the context of China's actual national situations.

This paper investigates the impact of the economic cycle on business capital investment by adding a measure of corporate investment capacity to the accelerated model, i.e. by adding proxy variables for capital structure and debt structure, and constructing the model as follows:

$$\begin{aligned}
 & INV \\
 & = \alpha_0 + \beta_1 CASH + \beta_2 REV + \beta_3 LEV + \beta_4 SL + \beta_5 SIZE \\
 & + \varepsilon_{i,t} \tag{1}
 \end{aligned}$$

$$\begin{aligned}
 & INV \\
 & = \alpha_0 + \beta_1 GDP + \beta_2 CASH + \beta_3 REV + \beta_4 LEV + \beta_5 SL \\
 & + \beta_6 SIZE + \varepsilon_{i,t} \tag{2}
 \end{aligned}$$

GDP, *INC* and *EXP* are all proxies for the economic cycle in the model, while *CASH* controls the firm's cash flow position, *LEV* controls the firm's capital structure, and *SL* controls the short-term debt situation of the firm.² The relationship between the proxies for the economic cycle and the scale of investment is studied through

control variables. Chinese scholars often use this formula to analyze the correlation between the economic cycle and the micro-investment behaviour of enterprises. It can

provide investment timing and investment strategy choices for enterprise management.

Table 2. Regression with dummy variables

model 1		model 2	
GDP	0.0008*** (0.000)	INC	0.0137*** (0.000)
		EXP	0.0068*** (0.000)
CASH	0.0034*** (0.000)	CASH	0.004*** (0.000)
SL	-0.0302*** (0.000)	SL	-0.0314*** (0.000)
IFV	0.0001*** (0.000)	IFV	-0.0008*** (0.000)
ROA	-0.0001*** (0.008)	ROA	-0.00004*** (0.009)
Con	0.0496*** (0.000)	Con	0.0555*** (0.000)
adjust R-squared	0.0217	adjust R-squared	0.027

Fig.2: The first column is the predictor variable, and the second column reports heteroskedasticity and autocorrelation robust t-statistics. *, ** and *** indicate significance at the 10%, 5% and 1% levels, respectively, according to wild bootstrapped p-values; 0.000 indicates less than 0.005 is absolute value.

3. RESULT

3.1 Regression With Dummy Variables

Model 1 uses the growth rate of GDP as a proxy variable for the economic cycle to test the extent to which fluctuations in economic growth affect a company's outward investment. The results indicate that a company's cash-to-assets ratio and macroeconomic fluctuations are positively related to a company's outward investment, suggesting that a company will significantly increase the scale of capital investment when it has sufficient free cash flow in hand. The more abundant the cash flow, the larger the scale of the company's investment. Meanwhile, the results show that a company's current debt ratio, gearing ratio and ROA show a significant negative relationship with the scale of investment. Firstly, it shows that the higher the current debt ratio of a company, the larger the short-term debt servicing pressure on the company, limiting the company's ability to invest. While a high ROA is a sign of good business performance, it does not mean that the company has more cash flow or is better at investing, so it is reasonable to assume that it is inversely correlating with corporate investment.

Model 2 divides the economic cycle into three phases: recovery, expansion and recession, and uses DER and EXP as proxy variables for the economic cycle respectively to test for differences in firms' investment behaviour at different stages of economic volatility. The regression results found that firms' outward investments behaved differently in different phases of economic volatility. INV is significantly and positively correlated

with the REC variable at the 1% level, indicating that, in the stage of economic recovery, a firm's capital investment grows with the economy.

Models 1 and 2 both indicate that investment is positively correlated with the economic cycle, suggesting that it is meaningful to study the impact of the economic cycle on firms' capital investment and that this impact of the economy on investment varies at different stages of development.

3.2 Sample Divided By Economic Phase

The data shows that during the recovery phase of the economy, the scale of investment by companies is positively correlated with the macro GDP growth rate at the 1% level. It indicates that during the recovery phase of the economy, as the economic growth, companies' investment will increase accordingly, and the scale of investment will expand. This indicates that in a gradually improving economy, investors are confident in the market and will therefore choose to increase capital investment to expand the size of their firms.

The regression results in an expansionary economy show that the level of investment INV is negatively correlated with GDP growth at the 1% level, which means during a period of high economic expansion, capital investment by firms not only does not increase correspondingly but also shrinks. This is because the economic environment has stabilised, national income is above the level of full employment, the stimulating effect of increased demand on business investment has been gradually reduced, and firms prefer to seek stability in a volatile economy. The regression results under the

recessionary phase indicate that the scale of firms' investment is synchronised with the economic contraction and that during the contractionary phase, firms will reduce their business expansion as the

economy declines due to the overall poor macro-environment and their pessimistic outlook. This is demonstrated by the positive correlation between investment level *INV* and GDP growth at the 1% level.

Table 3. Regression with three phase of economy

	Recovery	Expansion	Recession
CASH	0.0121*** (0.000)	0.0024*** (0.000)	0.0051*** (0.000)
SL	-0.0598*** (0.000)	-0.0644*** (0.000)	-0.0252*** (0.000)
IFV	-0.0032*** (0.000)	-0.00004 (0.226)	-0.0001*** (0.000)
ROA	0.0343*** (0.000)	-0.0001** (0.031)	0.0002*** (0.000)
GDP	0.0051*** (0.000)	-0.0027*** (0.000)	0.0005*** (0.000)
Cons	0.0433*** (0.000)	0.1248*** (0.000)	0.0463*** (0.000)
Adjust R-squared	0.056	0.0598	0.016

Fig3:Economic recovery refers to the business cycle following a recession and is primarily measured by a significant increase in GDP, a fall in unemployment and an increase in income. An economic expansion refers to two or more consecutive quarters of GDP growth.

4. CONCLUSION

Micro and macro research objects are different. From a micro perspective, when each person in the market pursues the maximization of personal benefits, each single market can achieve the most efficient allocation of resources. But from a macro point of view, when each person in the society is pursuing the maximization of individual interests, it may not necessarily achieve the maximization of social benefits as a whole. So the development of individual enterprises and the overall economic cycle are not always consistent.

This paper finds that economic cycles have a material impact on firms' capital investment and that firms' investment outcomes perform differently at different stages of the economic cycle through a study of companies listed on A- Share from 2000 to 2021. Also, the empirical results of this paper find that a firm's net profit does not represent a firm's willingness to invest, and even when a firm has a high ROA, it does not necessarily mean that the firm has sufficient cash flow for expansion. Also, this paper finds that by dividing the economic cycle into different phases, firms will also choose to expand in the economic recovery phase as the economy grows. However, during the economic expansion phase, due to the uncertainty of economic fluctuations, companies instead choose to invest more cautiously, and this rapid economic expansion does not give companies much confidence to invest. During the recessionary phase, companies also invest in a gradual slowdown. Therefore, when researching macroeconomics and companies, one cannot ignore the phases of the different stages of the economic cycle.

Reasonable control of economic fluctuation trends is a vital prerequisite for formulating economic policies. The following policy insights can be obtained by studying the relationship between the investment behaviour of micro-enterprises and the economic cycle: the economic cycle has a significant effect on corporate financing, so we should continue to adhere to a prudent monetary policy and maintain moderate growth in total credit, and as different industries perform differently in the economic cycle, it is more important to focus on adjusting the industrial structure to ensure that enterprises can receive policy support in the face of adverse economic shocks.

5. AUTHORS' CONTRIBUTIONS

This paper examines capital investment by Chinese firms from the perspective of the economic cycle, particularly the differences in investment behaviour across different stages of the economic cycle. Scholars have done much research on the macro aspects of investment, but little research has been done on how economic fluctuations affect micro firms. By exploring the investment behaviour of firms under different economic cycles, it can provide a theoretical basis for policy formulation on whether firms are willing to invest under different economic forms to help the state provide better policy support to firms.

This paper also proves that the circulation of the economic cycle depends on investment, and the investment decision depends on the entrepreneur's expectations for the future. Anticipation is a psychological phenomenon, so it is uncertain. When expectations are optimistic, investment increases and the

economy enters recovery and prosperity; when expectations are pessimistic, investment is reduced, and the economy falls into recession and depression. This interpretation of the business cycle is called the theory of mind.

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