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The Mechanism of Monetary Policy Uncertainty on Firms' Macroeconomic Attention: A Study Based on Text Analysis Method

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Abstract. This paper studies carefully how economic cycles and the uncertainty of monetary policy influence firms' attention to macroeconomic situations. We build a cross-level analysis structure that includes the intensity of economic cycle fluctuations, the monetary policy uncertainty index and the way firms allocate their attention, and the study shows the dynamic mutual connections among these three things in a systematic way. It is found that economic cycle fluctuations do two main things for firms: they directly change firms' ability to get resources and the actual market needs they face, and they also shape the environment for firms to make decisions in an indirect way by influencing the changes of monetary policy. The uncertainty of monetary policy will raise the cost of dealing with information for firms and make them form wrong expectations about their future earnings, and this situation makes firms pay much more attention to the signals of the macroeconomic situation. Also, the basic features of firms like their business scale and the years they have been running have a clear regulating influence on the changes of firms' attention, and large firms with a long running history show a much stronger reaction in their attention to macroeconomic situations. This paper makes the theory about how firms make their decisions more complete in an important way: it breaks the old assumption of the "completely rational economic man" and builds a new decision-making model based on limited rationality for firms. At the same time, the paper also gives a practical reference system for the people who make national policies to make macroeconomic management more scientific and better. What's more, the research results of this paper help to improve the exactness of policy design and the actual effect of macroeconomic expectation management, and they also have real and practical guiding value for the work of stopping systemic financial risks from appearing in the market.

Keywords: Monetary Policy, Economic Cycle, Attention Allocation, Text Analysis

1. Introduction

In the current complex and volatile global economic environment, monetary policy uncertainty has become a key factor influencing corporate strategic decisions. With the deepening of international trade integration, the spillover effects of monetary policies in major economies have increased

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significantly. For example, the tightening of US monetary policy has exacerbated output fluctuations in emerging markets through global trade channels, and this effect is amplified when uncertainty rises [1].

As a leading element of corporate strategic decision-making, macroeconomic attention is essentially a product of resource constraints under bounded rationality [2]. Under the dual pressures of intensified economic cycle fluctuations and the ambiguity of monetary policy signals, firms need to prioritize the allocation of limited cognitive resources to key information nodes. This attention allocation mechanism not only reflects the intensity of firms' perception of market risks, but also determines the precision of their response strategies. The course of reform and opening-up in China since the Third Plenary Session of the Eleventh Central Committee has shown that the gradual transformation of the institutional environment has not only shaped the macro background for firms' survival, but also reconstructed their way of decoding policy signals. When the economic cycle enters a downward phase, firms' attention sensitivity to policy shifts rises significantly, and this mode of attention allocation directly affects their investment strategies and risk control measures.

Studying the mechanism of economic cycles and monetary policy uncertainty on firms' macroeconomic attention holds important theoretical and practical significance. Theoretically, it helps break through the limitations of the hypothesis of the "perfectly rational economic man" in traditional firm decision-making theory and construct a more explanatory bounded rational decision-making model.

This study innovatively combines the two core dimensions of macroeconomic fluctuations with the cognitive mechanisms of microeconomic agents to build a cross-level analytical framework. By integrating indicators of the intensity of economic cycle fluctuations, the monetary policy uncertainty index and data on firms' attention allocation, it can systematically reveal the interaction mechanism between the macro environment and micro decision-making. This multi-dimensional research perspective not only helps deepen the theoretical understanding of corporate strategic decision-making behavior, but also provides a new analytical tool for solving the problem of information distortion in the "policy-market" transmission process. Against the backdrop of growing global economic uncertainty, this study has important practical significance for enhancing firms' risk resistance capacity and improving the transmission mechanism of macro policies.

This paper adopts a research method combining theoretical analysis and empirical research. First, based on the economic cycle theory, monetary policy uncertainty theory and firm attention theory, a theoretical model of the impact of economic cycles and monetary policy uncertainty on firms' macroeconomic attention is constructed. For the empirical research, panel data of A-share listed companies in China from 2007 to 2020 are collected, and multiple regression models are used to test the statistical relationships among variables. The research method innovatively combines panel data models, event history analysis and econometric methods to capture the impact paths of economic cycle fluctuations and monetary policy shocks on firms' attention allocation. In particular, when it comes to the building of the macroeconomic attention indicator, this study uses a count data model to make a systematic evaluation of the intensity of firms' reaction to policy signals. It does so by quantifying how often macroeconomic key words show up in the text of corporate annual reports in a specific way.

The policy value of this study is that it provides a new analytical angle for the design of macroeconomic policies. It first quantifies the relationship between firms' attention to the macroeconomy and their capacity to respond to policies, and then it studies the different characteristics of the policy transmission mechanism in different stages of the economic cycle.

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Through such research work, the study offers empirical evidence for optimizing the mix of policy tools and also for improving firms' ability to adapt to various macroeconomic policies.

2. Theoretical analysis and research hypotheses

2.1. Theoretical analysis

The economic cycle theory aims to explain the cyclical fluctuations of economic activities and their formation mechanisms. In the subject system of Western economics, this research has long been seen as a basic problem, and different economic schools have put forward their own theoretical systems for this specific problem. The Keynesian cycle theory holds that economic changes mainly come from the shifts in aggregate demand, and it suggests that the government should step in to keep the economy stable. This theory lays stress on the problems of the market mechanism, and it puts forward fiscal and monetary policies as tools for regulation to reduce the bad effects brought by economic fluctuations.

The Real Business Cycle (RBC) Theory links economic fluctuations to basic outside factors like technology shocks from the outside, and it states that the market mechanism has the ability to adjust itself. So it is against too much intervention from the government. This theory emphasizes outside factors such as technology shocks, and it points out the features of moving together and being unbalanced in economic cycles, that is, the unbalanced state between the period when the economy expands and the period when the economy falls into recession. Through building an outside shock model, the RBC Theory explains how economic cycles are formed, and it holds that the market can go back to a balanced state by itself without the direct intervention of the government.

The New Keynesian Theory, based on keeping the ideas of market problems such as sticky prices and unchanging wages, explains the lasting effect of economic fluctuations, and it stresses the key role of policies in keeping the economy stable. This theory argues that because of the slow change of prices in the market, the lasting effect of economic fluctuations becomes stronger, and so people need to use monetary and fiscal policies together to make the regular cyclical changes of the economy more stable.

These theories form the basic support for knowing economic cycle fluctuations together, and they also provide a theoretical system for analyzing the behavior of firms in the process of economic cycles. By combining these different theoretical views, we can study how economic cycles and the uncertainty of monetary policy work on firms' attention to the macroeconomy more fully. For instance, when the intervention of policies is proved to have good effects, firms are more likely to pay more attention to policy signals instead of the market's own spontaneous adjustments; when the effects of policies are not sure, firms may start to study other influencing factors such as outside technology shocks or the changes of market demand. This process of finding the differences and combining different economic theories not only adds to the research aspects of economic cycle theory, but also provides firm basic theoretical support for the practical study of the mutual connection between firm behavior and the macroeconomic environment.

The Monetary Policy Uncertainty Theory is a key system for analyzing the changing features in the process of carrying out economic policies, and its main point is shown as the fact that it can't be predicted and is not stable in the process of setting the goals of monetary policy, using the policy tools and getting the feedback of policy effects. The unclearness of policy goals comes directly from the complexity of the macroeconomic environment. For instance, in the constant changes of the regulation direction of China's monetary policy, the people who make policies face great different situations in the scope of making decisions at different stages of the economic cycle, and this

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mechanism of constant adjustment is itself a possible cause of uncertainty in the process of carrying out the policy.

In the macroeconomic environment, when economic cycle fluctuations intensify or monetary policy uncertainty rises, the information complexity and decision-making risks faced by firms increase significantly, and the allocation of attention resources then becomes crucial. Studies have shown that firms need to devote more attention to the processing and analysis of macroeconomic information to identify potential opportunities and avoid risks.

Further studies have shown that the allocation of macroeconomic attention exhibits significant industrial heterogeneity. For example, firms in industries highly affected by policy regulation (such as the energy and financial industries) usually have more sensitive macroeconomic perception capacity, and the proportion of macroeconomic information in the attention allocation of their top management teams is significantly higher than that in other industries. This difference stems from the industry-specific risk exposure and policy sensitivity, and also reflects the industrial adaptability characteristics of corporate strategic adjustment.

2.2. Research hypotheses

Based on the economic cycle theory, monetary policy uncertainty theory and relevant theories of corporate decision-making behavior, this study proposes the following research hypotheses:

• Hypothesis 1: Firms with higher macroeconomic attention will adjust prices more rapidly after monetary policy shocks. High-attention firms can incorporate monetary policy shocks into inflation expectations more quickly and adjust quotations in advance through the cost-plus pricing model, that is, there is a positive correlation between firms' macroeconomic attention and the speed of price adjustment.

• Hypothesis 2: Economic cycle fluctuations and monetary policy uncertainty (hereinafter collectively referred to as uncertainty), as key variables affecting firms' financing costs and investment environment, their changes are transmitted to the real economy through channels such as credit and exchange rates. The higher the degree of uncertainty, the stronger the demand for firms to monitor and analyze the macroeconomic environment to cope with potential risks, that is, there is a positive correlation between monetary policy uncertainty and firms' macroeconomic attention.

• Hypothesis 3: There is a polarization in the distribution of firms' attention to the macroeconomy, that is, at the same time node, firms that pay attention to the macroeconomy always maintain a high level of attention to it in subsequent performance, while those that do not pay attention keep their inattentive behavior.

3. Empirical model and analysis

3.1. Data sources and methods

Compared with the proxy variables of macroeconomic indicators widely used in existing literature, the text analysis method can directly capture the intensity of perception and focus of attention of corporate decision-makers on changes in monetary policy, effectively solving the measurement error problem caused by information asymmetry and subjective cognitive differences [3]. The analysis in this paper uses 55,753 annual report documents submitted by 5,405 companies from 2005 to 2023. To measure firms' attention, the frequency of keyword mentions by firms is counted based on a dictionary, and the timing of firms' discussions on the following nine macroeconomic themes is identified through counting: aggregate economy, exports, employment, consumption, investment,

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currency, real estate, inflation, and oil. Each theme is matched with a keyword dictionary containing the content of titles of reports, news and other materials searched according to the relevant macroeconomic themes, as well as the related words in them. This paper develops two metrics to quantify corporate attention using keyword analysis: (1) Attention prevalence d_{it}^{k} - a binary indicator reflecting if firm i referenced theme k's keywords during time t; (2) Attention intensity s_{it}^{k} - calculated by dividing keyword mentions by the firm's total word count in disclosures.

$$d_{it}^{k} = 1(Totaltopic - kwords_{it} > 0)(AttentionPrevalence)$$

$$s_{it}^{k} = \frac{Totaltopic-kwords_{it}}{Totalwords_{is}}(AttentionIntensity) \quad (1)$$

In most parts of this paper, prevalence is taken as the basic way to measure firms' attention. This is because prevalence and this measure have a very close connection, and the changes that have nothing to do with firms' attention produce only a tiny influence on the prevalence indicator. There is a specific situation that can show this clearly: when the appendices of corporate annual reports are expanded and the main thematic content is not modified at all, the measurement results of attention intensity will become weaker simply because the overall length of the documents is increased. But attention intensity is also of great importance, for it helps to understand the marginal effects of attention and the countercyclical changes of attention that are introduced in the following parts of the paper.

3.2. Validity test of text analysis

This analysis uses comparisons between different industries to test two hypotheses: (a) the consistency between the attention prevalence metrics and the predictions from the incomplete information model, and (b) the ability of these metrics to predict how accurately companies make their forecasts. This kind of verification clearly shows that this measuring method is effective in quantifying the information focus of individual firms.

Then the study looks into the clustering features of prevalence scores in different industries within nine different thematic categories. As we can see from Figure 1, the highest prevalence values always show up in the industries that have theoretical connections with each other. This situation not only proves the construct validity of this measuring method but also confirms that textual analytics is a reliable way to track the attention of firms.

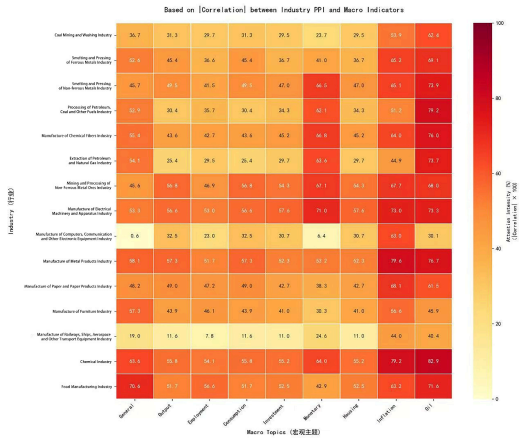

Figure 1. Heatmap of industry-macroeconomic theme attention

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3.3. Price adjustment speed in response to monetary shocks

Next, this paper will check whether the price adjustment speed of industries that pay close attention to macroeconomic information is in line with the theoretical predictions of the attention effect in incomplete information models when these industries face monetary policy shocks. In other words, it will verify if these industries adjust their prices at a faster speed [4,5]. To test this hypothesis, this paper uses the interaction term of high-frequency monetary policy shocks as a new and innovative identification tool, and it makes a quantitative analysis of the dynamic correlation between corporate attention and the price response of industries to monetary policy shocks. Within a time period of h months, this paper builds the following model for the above analysis:

$$\log P_{s,t+h} - \log P_{s,t} = \alpha_s + \alpha_t + \beta_v^h v_t^M + \beta_d^h d_{st} + \beta_{dv}^h d_{st} v_t^M + \Gamma' Z_{st} + \varepsilon_{st} \quad (2)$$

where $P_{s,t}$ is the Producer Price Index (PPI) of industry s in month t (Note: this paper designates January 2005 as t = 0, then February 2006 as t = 13, and so on), v_t^M denotes the monetary shock in month t, d_{st} denotes the average industry prevalence, and Z_{st} is a control variable vector including industrial production, recession indicator and industry size. This paper includes industry and time fixed effects $\{\alpha_s, \alpha_t\}$, and clusters standard errors by industry and year. For the convenience of making the analysis easier to understand, monetary shocks are standardized in this paper, and the positive values of these shocks stand for expansionary shocks in this setting. This paper leaves out the financial industry and the utility industry, and this is a usual research practice when people estimate how firms react to different monetary shocks.

The results from the empirical research show clear time-related patterns in the process of price adjustments across various industries. As we can see from Figure 2a, the average influence of attention prevalence on the prices of different industries, which is marked as β_v^h, reveals a non-monotonic price change trend. This trend has two key characteristics: the speed of price adjustment speeds up at the very beginning, and then it slows down little by little after the implementation of expansionary monetary policy interventions. Figure 2b goes on to examine the heterogeneous treatment effects by analyzing the marginal effect of attention prevalence on industry price responses, which is β_{dv}^h. The analysis points out that the industrial sectors that show greater sensitivity to macroeconomic signals (the sensitivity is measured by the frequency of relevant keywords) adjust their prices much more quickly in the short immediate period after the monetary shocks occur, which is the 0-12 months period. This kind of differential response reaches its highest point at about 5 months after the shocks happen, and then it gradually converges with the general industry benchmarks. In this way, the research provides strong empirical validation for Hypothesis 1.

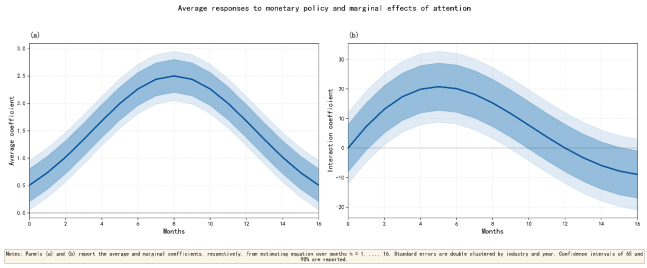

Figure 2. The impact of attention prevalence on industry prices

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3.4. Investigating forecast accuracy

To check if the prevalence metric has a valid predictive function, this paper looks into its ability to forecast how accurately firms make their predictions at the firm level. Our analysis uses a subsample that is in line with the Hundred Economists Survey, and the survey adopts quota sampling across different industries, regions and firm sizes to figure out the macroeconomic conditions and the specific situations of individual firms. The survey includes two questions about future economic trends: (1) the expected inflation rate over the next two years and (2) the expected growth of corporate revenue. We calculate the matching rate between the forecasts made by firms and the actual economic results, and then divide firms into two groups—attention-focused firms and non-attention-focused firms—according to the data from the prevalence measure. To be more specific: (1) We use the actual annual inflation rates as a benchmark to compare with the inflation forecasts of firms, and (2) We compare the projected revenue growth with the actual sales volume of the following year. Panel A of Table 1 shows that the firms classified as attention-focused can predict the inflation rate with much higher accuracy. This gap in prediction accuracy becomes the biggest when we use the prevalence measure derived from inflation data, and the attention-focused firms perform 13 percentage points better in inflation prediction than their other industry peers. Panel B of Table 1 shows that such firms also have a similar accuracy advantage in making sales growth predictions, and this result indicates that they can make good use of macroeconomic information to work out better development plans for their own business operations.

Table 1. Forecast accuracy of firms with and without macroeconomic policy attention across different themes

Theme Classification	Aggregate Economy		Currency		Inflation	
Panel A: Macroeconomic Forecast (Inflation 2 Years Ago)	Attention-focused	Non-attention-focused	Attention-focused	Non-attention-focused	Attention-focused	Non-attention-focused
Average Accuracy Rate	42.68%	37.11%	44.72%	37.71%	43.71%	42.16%
Number of Accurate Forecasts	76	24	64	48	25	76
Panel B: Microeconomic Forecast (Sales Growth 1 Year Ago)	Aggregate Economy		Consumption		Exports	
	Attention-focused	Non-attention-focused	Attention-focused	Non-attention-focused	Attention-focused	Non-attention-focused
Average Accuracy Rate	35.90%	23.09%	37.12%	33.99%	79.37%	34.64%
Number of Accurate Forecasts	73	18	47	59	42	63

3.5. Potential drivers of firms' attention

Based on the verification that the text analysis method can capture firm attention data in this paper, by summarizing the change relationships of the data in the above experiments across different times and firms and exploring the potential drivers of firm attention, this paper finds that during the sample period:

The overall attention exhibits countercyclical changes, and most firms remain polarized between always paying attention and never paying attention.

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3.5.1. Countercyclical attention to economic conditions

During the sample period of this paper, the proportion of firms mentioning economic keywords and the intensity of discussion show countercyclical changes. Figure 3 shows the annual average occurrence rate and intensity measure of the phrase "economic conditions". The upper graph shows that the proportion of firms mentioning "economic conditions" has risen steadily since 2005, with particularly rapid growth in 2012, a period when the 18th National Congress completed the institutionalization of leadership transition, and the European debt crisis pushed up the US Dollar Index, triggering capital outflows and a decline in foreign exchange holdings. The average intensity in the lower graph of Figure 3 also surged during this period. This paper takes these sharp dynamic changes as evidence of countercyclical attention, and Figure 4 depicts the overall trend of firms' macroeconomic attention and its relationship at different time nodes.

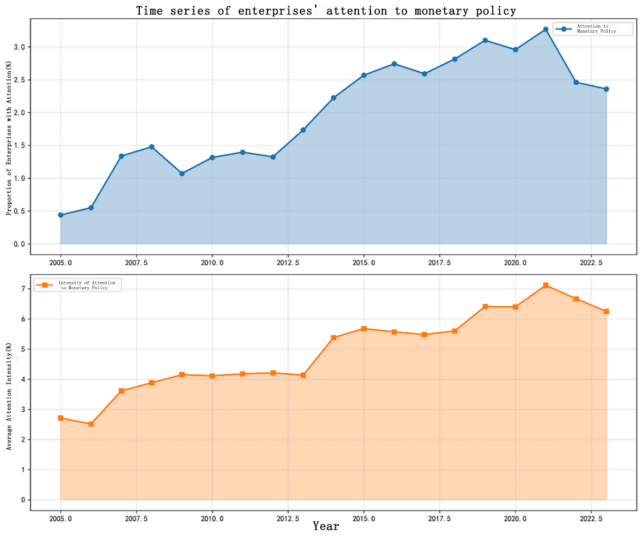

Figure 3. Firms' attention to monetary policy over time

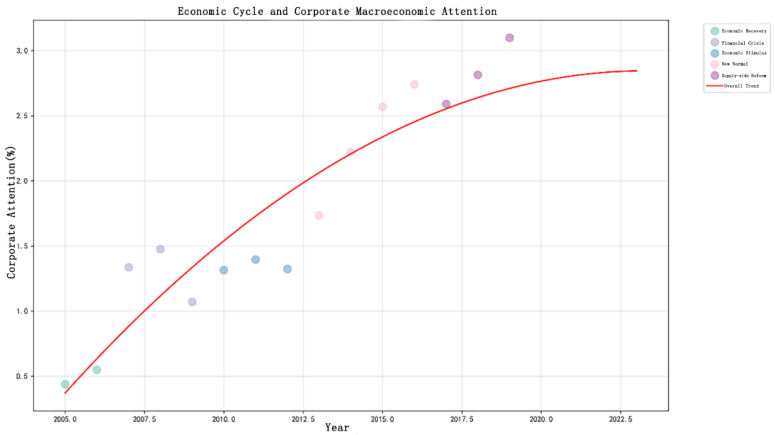

Figure 4. The relationship between economic cycles and firms' macroeconomic attention

3.5.2. Polarization of firm attention

Despite the countercyclical dynamics documented above, most firms in the sample of this paper are polarized, either always discussing economic conditions in their annual reports or never discussing

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them. Figure 5 illustrates this by plotting the proportion of each firm mentioning the same keyword "economic conditions". The result distribution in the left graph is concentrated at two extremes, with the vast majority of firms taking values of either 0 or 1.

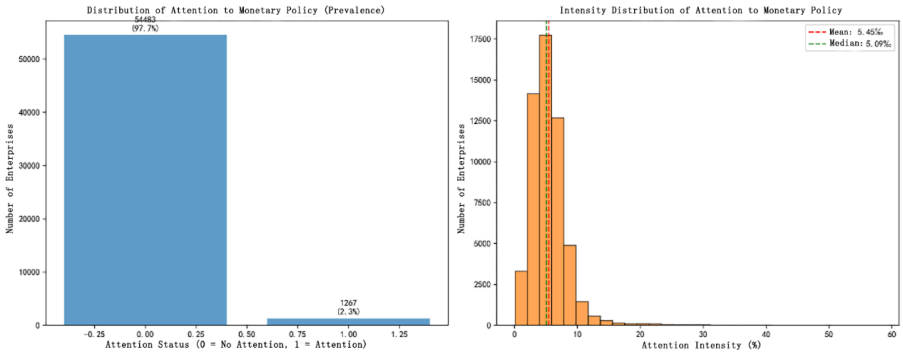

Figure 5. Distribution of firms' attention to monetary policy

The empirical findings demonstrate that attentional shifts predominantly manifest as inter-firm variations rather than intra-firm dynamics. As visualized in the right-hand panel, industry-level aggregation reveals a concentration of firms around sectoral means, while the remaining firms exhibits distinct bimodality - a pattern that substantiates the polarization mechanism posited in Hypothesis 3.

3.5.3. Further evidence of countercyclical attention

To understand what drives firms to pay attention to macroeconomic conditions and the differences between firms with concentrated attention and their competitors, this paper turns to studying firm-specific and macroeconomic factors that may be related to it. First, this paper quantify the associations between firm attention and four fundamental firm attributes—scale (size), maturity (age), financial structure (leverage), and operational efficiency (productivity)—using both cross-sectional comparisons and longitudinal firm-level examinations. Then this paper we analyze the dynamic interplay between macroeconomic conditions (measured by GDP fluctuations) and attention patterns, incorporating consensus expectations from the Survey of Professional Forecasters as a proxy for aggregate market sentiment. The findings of this paper show that size, age, productivity, economic growth and aggregate uncertainty are important for understanding the observed variation in attention. These relationships are formally estimated through the following regression specification:

$$\text{Cross} - \text{firm variation}: \ y_{i(j)t} = \alpha_j + \delta_t + X_{it}\beta + \varepsilon_{it} \tag{3}$$

$$\text{Within} - \text{firm variation}: \ y_{i(j)t} = \nu_i + \delta_t + X_{it}\beta + \varepsilon_{it} \tag{4}$$

where the composite variable $y_{i(j)t} \in \{d_{i(j)t}, \log s_{i(j)t}\}$ represents quantifies firm-level attention dynamics, The control vector X_{it} encompasses firm-specific traits: size (log total assets), age (years since listing), leverage (debt-to-asset ratio), annual report length, and productivity. The specific measurement rules are shown in Table 2. Equation (2) incorporates time-industry fixed effects to identify cross-sectional heterogeneity, with standard errors clustered by industry-year and equation (3) employs firm fixed effects to isolate temporal variation within firms, clustering

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standard errors at firm-year level. Firm characteristic data are sourced from the CSMAR Database with the following operationalization:

Table 2. The measurement rules for the variables in the control vector X

Variable	Measurement Protocol
Size	$\log(\text{total assets})$
Age	years from IPO to year t
Leverage	total liabilities / total assets
Productivity	using Olley-Pakes (1996) control function approach [6] and implemented via Wooldridge (2009) GMM [7]

The results of this analysis are shown in Table 3. (Scale note: Both $d_{i(j)t}$ (units: percentage points) and $\log s_{i(j)t}$ (units: percentage points) are scaled by 100.)

Table 3. The relationship between firm attention and firm variables

Analysis Type	Variable	$d_{i(j)t}$ Value	$\log s_{i(j)t}$ Value
Cross-firm Analysis	Size (log total assets)	1.92 ***(0.11)	3.49 ***(0.41)
	Age	0.00 (0.02)	0.23 ***(0.03)
	Leverage	1.39 (0.38)	6.01 (3.31)
	Productivity (TFPR)	1.04*** (0.46)	2.65 ***(1.50)
	Observations	52863	52863
	(R^2)	0.004	0.012
	Industry FE	yes	yes
	Firm FE	no	no
Within-firm Analysis	Size (log total assets)	0.75 (0.41)	3.52*** (0.68)
	Age	2.04*** (0.02)	2.37*** (0.52)
	Leverage	1.00 (1.39)	6.63 (3.75)
	Productivity (TFPR)	1.39 ***(0.38)	0.67 (0.43)
	Observations	52863	52863
	(R^2)	0.635	0.689
	Industry FE	no	no
Analysis Type	Firm FE	yes	yes

This paper finds that firms with a larger scale, higher maturity and better productivity tend to have much higher attention levels. Among these features, the link between a firm's size and its efficiency is the most obvious in the whole sample, while the impact of firm age is mainly seen in single enterprises. Taken together, these results show that well-established high-productivity firms may pay more and more attention to strategic supervision over a long period, while smaller and less efficient firms may keep ignoring such overall views.

Next, the analysis studies how attention changes in response to macroeconomic fluctuations and collective expectations. To quantify the countercyclical attention pattern shown in Figure 3, attention

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metrics are regressed against annual real GDP growth rates. A further examination explores the correlation between attention and three overall uncertainty indicators: the interquartile range of forecasts (reflecting disagreements among forecasters), consensus forecast errors (capturing the different reactions of firms to asymmetric shocks), and absolute forecast errors (measuring the accuracy of beliefs no matter the direction of the errors). Each metric represents a different dimension of uncertainty. The relationship between attention and these overall variables is modeled as follows:

$$y_{i(j)t} = \nu_i + \delta\zeta_t + \beta x_{it} + \varepsilon_{it} \tag{5}$$

where $y_{i(j)t} \in \{d_{i(j)t}, \log s_{i(j)t}\}$ denotes the attention indicators, as mentioned earlier, ζ_t is the aggregate variable, x_{it} is the length of the annual report, and ν_i denotes firm fixed effects. Standard errors are clustered by firm and year.

The estimation results are reported in Table 4. Row 1 shows a strong countercyclical attention pattern, while Row 2 shows a strong positive correlation between forecast disagreement and firm attention. Row 4 indicates that the phenomenon of more firms starting to pay attention to macro policies is associated with negative economic shocks, and Row 3 shows that firms pay more attention to macroeconomic conditions when consensus forecasts are less accurate. The above results verify Hypothesis 2 of this paper.

Table 4. Countercyclical attention

Aggregate Variable	Attention Prevalence	Attention Intensity
rGDP growth	-0.12^{***} (0.17)	-8.06(0.75)
IQR index	3.75^{***} (0.18)	14.51(4.10)
Abs(FE) index	1.09^{***} (1.02)	19.86(4.36)
FE index	-1.50 (0.26)	-7.92(4.64)
Observations	52863	52863
R^2	0.536	0.781
Firm FE	yes	yes
Quadratic Trend	yes	yes

4. Conclusions and policy recommendations

Through constructing a theoretical model and conducting empirical tests, this paper reveals the complex relationship between economic cycles, monetary policy uncertainty and firms' macroeconomic attention. The study finds that fluctuations in the economic cycle greatly increase firms' attention to the macroeconomy. This means that firms will take active steps to adjust their strategies for processing information to adapt to changes in the external environment when they face economic expansion or contraction. Specifically, in an economic downturn, firms may avoid potential risks by keeping a closer watch on policy signals, optimizing resource allocation or adjusting investment plans. In an economic expansion period, they can seize market opportunities by catching hold of market growth signals instead. This adjustment of attention reflects firms' dynamic adaptability to the economic environment, and it also proves that the economic cycle acts as a key external driving factor for such attention changes.

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Monetary policy uncertainty also has a notable positive impact on firms' attention to the macroeconomy. The research results show that when the level of uncertainty in the policy environment rises, firms will clearly step up the intensity of monitoring various macroeconomic indicators. This phenomenon may stem from firms' attempts to cut down decision-making risks by collecting information in a more active way.

The interaction effect between economic cycles and monetary policy uncertainty further shows that policy environment uncertainty amplifies the impact of economic fluctuations on firm attention. When monetary policy uncertainty is high, the marginal effect of economic cycle fluctuations on firms' attention rises in a notable way. This non-linear relationship may come from the complex decision-making environment that firms face under the superposition of dual uncertainties. On the one hand, economic fluctuations themselves require firms to adjust their development strategies. On the other hand, policy uncertainty adds to the unpredictability of the adjustment paths, forcing firms to strengthen their macroeconomic attention to cope with these two kinds of challenges together. This interaction mechanism offers an important basis for firms to formulate development strategies in a complex macroeconomic environment.

The moderating effect of firm characteristics on attention changes highlights the obvious heterogeneous features of different firms. Firms that are larger in scale, longer in operation and higher in productivity tend to show a higher level of macroeconomic attention. This situation may result from the differences in resource endowments among different firm groups when they deal with macroeconomic shocks. Large firms have stronger capacity for processing information and resisting various risks. For this reason, policymakers need to pay attention to such heterogeneous characteristics to carry out targeted regulatory measures. All the above conclusions together build a multi-dimensional analytical framework linking the macroeconomic environment, policy tools and micro-level corporate behaviors, and it provides a new theoretical perspective for people to understand the mechanism behind firms' decision-making activities.

Based on the conclusions drawn from the empirical research, this paper puts forward the following policy recommendations to reduce the negative impact of macroeconomic uncertainty on firms' operational decision-making. First of all, the government needs to enhance the transparency and predictability of various macroeconomic policies. By setting up a standardized release mechanism for policy information, it can strengthen the continuity of policy transmission, and thus reduce the risk of wrong market judgments caused by unclear policy signals.

Encourage firms to build a macroeconomic early warning and response mechanism. For large firms, tax incentives or special subsidy policies can be adopted to support them in setting up internal macroeconomic research departments or establishing cooperative relations with professional think tanks, so as to enhance their dynamic monitoring capacity of key economic indicators. To address the resource constraints of small and medium-sized enterprises (SMEs), industry associations can take the lead in building regional economic information sharing platforms, integrate industry data and policy interpretation resources, and help them identify potential risks and formulate response plans. Firms should focus on cultivating sensitivity to policy signals, industry prosperity and changes in the international environment, and realize forward-looking risk management through the establishment of a multi-level early warning indicator system.

At the level of macroeconomic cycle management, the central bank needs to further enhance the precision and timeliness of countercyclical adjustment tools. By improving the forward guidance mechanism in the monetary policy framework, the capacity to predict economic fluctuations is enhanced, and the lag effect of policy adjustments that exacerbate market fluctuations is avoided. In specific operations, the pace of use of tools such as open market operations and the required reserve

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ratio can be optimized based on real-time economic data, and at the same time, structural monetary policy tools can be used to provide targeted support for industries severely affected by cyclical shocks. In addition, it is necessary to strengthen the synergy with fiscal policy to form a joint force of cross-cyclical regulation to smooth out the amplitude of economic fluctuations.

Particularly importantly, it is necessary to establish a special support system to address the weak information acquisition capacity of SMEs. The government can develop an intelligent push system for macroeconomic information relying on big data platforms, and provide customized analysis reports according to tags such as firm size and industry characteristics. By setting up a Special Subsidy Fund for Macroeconomic Information Services of SMEs, the cost of purchasing professional consulting products is reduced. At the same time, macroeconomic knowledge training can be carried out in conjunction with universities and financial institutions to improve the policy interpretation and analysis capacity of corporate managers and narrow the gap in information processing between them and large firms.

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