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Countercyclical Policy Bank Loans and Economic Stability: Evidence from China's Listed Firms

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Abstract: This paper examines the underexplored role of China's policy bank loans as a countercyclical tool for stabilizing economic fluctuations, complementing conventional fiscal and monetary policies. Utilizing panel data on Chinese listed companies from 2005 to 2023, we demonstrate that policy bank loans effectively mitigate the adverse impacts of economic downturns and ensure corporate value stability during periods of contraction. The research further identifies that the countercyclical effect of these loans is influenced by both internal factors, including political and economic stability and tax revenue growth, as well as external factors such as global financial uncertainty. Additionally, the study highlights the complementary role of policy bank loans alongside conventional stabilization interventions, strengthening the combined capacity to enhance macroeconomic stability.

Key words: Policy banks; Countercyclical; Listed firms; Economic stability

JEL classification: G21; G32

1. Introduction

Policy banks have emerged as a crucial element within national financial systems on a global scale. For example, the Export-Import Bank of the United States (EXIM) is established with the objective of bolstering American employment by facilitating the export of United States goods and services. In Germany, the Kreditanstalt für Wiederaufbau (KfW) predominantly focuses on supporting small and medium-sized enterprises (SMEs) while also promoting the transition towards a sustainable green economy. Similarly, Bpifrance in France plays an instrumental role in assisting SMEs and fostering innovation. In Japan, the Development Bank of Japan is pivotal in advancing regional development and implementing environmental initiatives. Meanwhile, Brazil's Banco Nacional de Desenvolvimento Econômico e Social (BNDES) is dedicated to financing major infrastructure projects and social development aligned with governmental priorities.

In the context of China, three principal policy banks—the China Development Bank (CDB), the Agricultural Development Bank of China (ADBC), and the Export-Import Bank of China (CEXIM)—constitute the backbone of the nation's financial strategy. These institutions play a vital role in supporting long-term infrastructure development, agricultural advancement, and the facilitation of international trade and investment, respectively. Through their targeted financing and strategic initiatives, these policy banks contribute significantly to the overarching economic goals of their respective nations.

From a microeconomic perspective, policy banks offer low-interest loans to SMEs, providing essential financial support for their long-term growth. However, for publicly listed companies, which already have access to a variety of financing channels, it is crucial to examine whether policy bank loans play a role beyond the provision of financial support. Like other enterprises, listed companies operate within the broader economic cycle. In many cases, they exhibit procyclical behavior by adjusting investment and production in response to economic fluctuations, thereby amplifying cycles of boom and bust.

Traditional fiscal and monetary policies, while vital, face significant constraints in smoothing business cycles. Fiscal policies can stimulate aggregate demand, but it is often limited by solvency concerns and political resistance. Similarly, the capacity of monetary policy to stabilize the economy weakens in liquidity traps, particularly when nominal interest rates hit the zero lower bound. To circumvent these traditional limits, central banks have increasingly relied on unconventional measures such as Quantitative Easing (QE). However, the long-term utility of QE is often compromised by its tendency to exacerbate wealth inequality through asset price inflation, and the risk of diminishing marginal returns as central bank balance sheets become bloated (Borio and Zabai 2018). These systemic limitations justify the search for alternative countercyclical instruments including the targeted deployment of policy bank loans. Such loans can bypass frictions in traditional transmission channels and offer a more direct mechanism for stabilization.

This paper contributes to this agenda by investigating the countercyclical role of policy bank loans, particularly their impact on publicly listed firms in China. We collect data on policy bank loans at the firm level. Compared to national-level macroeconomic data, firm-level data allows for a more in-depth analysis of the causal relationship between policy bank loans and the economic cycle. In terms of empirical design, this paper employs a firm-level fixed-effects model to control for firm-specific factors that do not vary over time, thereby mitigating errors arising from omitted variables. However, because the fixed-effects model relies on firm-internal time-series fluctuations,

it may be difficult to estimate the impact of firm-specific factors that do not vary over time. Our findings suggest that, beyond offering direct financial assistance, policy bank loans serve to stabilize corporate value. We demonstrate that the effectiveness of these loans is contingent upon an interplay of domestic and external factors, such as political stability, tax revenue growth, economic conditions and global financial uncertainties respectively. By providing a financial buffer to listed companies, policy bank loans mitigate procyclical behavior, thereby enhancing the overall resilience of the economy.

The remainder of this paper is structured as follows: Section 2 reviews the literature on countercyclical policies and policy bank lending, laying the groundwork for this study; Section 3 presents the derivation of the theoretical model and the empirical design; Section 4 analyzes the countercyclical effects of policy bank lending through empirical analysis and examines policy coordination and other related issues; Section 5 summarizes the main findings and identifies the limitations of the study.

2. Literature review

2.1 Countercyclical policies

The Keynesian theory strongly advocates for countercyclical fiscal policies, while procyclical fiscal policies exacerbate fiscal vulnerabilities, countercyclical fiscal policies are effective in mitigating economic contractions (Tao, Saadaoui, and Silva 2025; Dai et al., 2015). Similarly, monetary policy can alleviate economic uncertainty through countercyclical mechanisms (Blampied and Mahadeo 2023). However, several factors like corruption, public debt, and political instability can influence the cyclicality of these policies. Alesina, Campante, and Tabellini (2008) argue that rent-seeking behavior, often driven by corrupt governments, compels voters to push for tax cuts or increased government spending during economic booms. This political distortion increases government debt during periods of expansion and restricts the capacity to raise debt during recessions, amplifying the procyclical nature of fiscal policies. Furthermore, the level of public debt in a country can significantly impact fiscal cyclicality, sometimes even reversing it (Combes, Minea, and Sow 2017). Fluctuations in the tax base also contribute to the procyclicality of fiscal policies, especially in countries with volatile revenue streams (Talvi and Végh 2005).

In addition to these factors, the informal economy and institutional quality can constrain the effectiveness of countercyclical fiscal policies. Studies by Çiçek and Elgin (2011) and Elgin et al. (2022) suggest that the shadow economy increases volatility in a country's tax base and public savings, thus reducing the effectiveness of countercyclical fiscal measures. Moreover, scholars have extended this analysis to the cyclicality of interest rates and credit spreads. Airaudo and Olivero (2019) observe that interest rate movements play a critical role in the dynamics of credit cycles.

The cyclicality of policies varies across countries, that fiscal and monetary policies in developing countries tend to be positive cyclical synchronicity due to institutional weaknesses, heightened country risks, and other factors (Calderón and Schmidt-Hebbel 2003; Calderón et al., 2016; Calderón and Nguyen 2016; Çiçek and Elgin 2011). Volatility in an economy’s tax base often triggers fiscal deficits, which explains the countercyclical fiscal policies of advanced economies like the G7 and the procyclical fiscal policies observed in many developing countries (Talvi and Végh 2005). However, this view has been contested. Scholars such as Combes, Minea, and Sow (2017) and Jeffrey A. Frankel, Vegh, and Vuletin (2013) highlight that some developing countries and emerging economies have successfully moved away from procyclical fiscal patterns and

adopted countercyclical fiscal policies. Mackiewicz (2023) further finds that institutional quality plays a more significant role in shaping positive cyclicality of fiscal policy in developed countries than in developing ones. Additionally, Jeffrey Frankel (2011) observed that fiscal and monetary policies in commodity-producing countries are more strongly positively correlated with the cycle. In contrast, procyclical fiscal policy is inherently flawed and can exacerbate economic contraction (Bausch 2019). The growing body of literature validates the significance of countercyclical and cross-cyclical policy adjustments in preventing and mitigating economic and financial risks, as well as stabilizing growth (Aghion, Hémous, and Kharroubi 2014; Filardo, Hubert, and Rungcharoenkitkul 2022). Among these, countercyclical mechanisms in fiscal and monetary policies have received substantial attention.

2.2 Countercyclical Mechanism for Policy Bank Loans

Policy bank loans, as instruments of policy finance, operate on the principle of "cost recovery with minimal profit," which helps stabilize credit and encourage investment. Their policy-driven nature allows them to influence social expectations and address market failures. Unlike commercial banks, policy banks offer stronger economic support during crises, displaying lower risk aversion and injecting liquidity into enterprises (Coleman and Feler 2015). In particular, policy banks use medium- to long-term investment and financing tools to provide targeted loan support. In the short term, this boosts aggregate demand, stabilizes employment, and helps mitigate economic fluctuations, thus accelerating recovery. Over the medium-to-long term, policy banks support national strategic priorities by promoting development in key sectors and addressing vulnerabilities within the economy. Beyond financial support, policy bank loans also signal government policy intentions, encouraging commercial banks to extend credit and leveraging additional social capital to foster investment, collectively stabilizing economic cycles.

Building on the rigid structure of fiscal expenditures (Friedman 1995; Yao, Yan, and Zhu 2021). This allows policy banks to effectively address gaps in fiscal and monetary policies. Particularly when fiscal deficits widen, policy space narrows, and monetary policy encounters the constraints of the "trilemma," the involvement of policy banks can help alleviate the policy limitations faced by traditional fiscal and monetary mechanisms (Gaspar et al. 2016). Therefore, policy bank lending can function as a complementary financial instrument, effectively operating during economic booms and providing steady support during recessions, thereby mitigating the adverse effects of economic fluctuations. This highlights the role of policy banks as critical countercyclical regulators.

Additionally, a country's capacity for policy implementation plays a crucial role in shaping cyclical policy decisions (Calderón, Duncan, and Schmidt-Hebbel 2016). Strong national institutions are closely linked to the ability to implement countercyclical policies. Countries with robust institutions are better positioned to execute countercyclical measures. In contrast, those countries with weak institutions, which may be impacted by factors such as foreign borrowing restrictions, unstable domestic financial systems, low political credibility, and corruption—may struggle to leverage fiscal and monetary policies for countercyclical purposes (Calderón, Duncan, and Schmidt-Hebbel 2016; Mackiewicz 2023). China, with its relatively low political risk and strong macroeconomic management capacity, is better equipped to formulate composite economic policies. Thus, China is able to integrate both countercyclical and cross-cyclical measures, allowing policy banks to effectively play a countercyclical role in stabilizing the economy.

Beyond domestic factors, external risks also influence the effectiveness of countercyclical policies. Increased external economic uncertainty can disrupt domestic economic and financial

conditions, heightening the cost of countercyclical lending by policy banks. On one hand, global economic uncertainty can transmit negative shocks to domestic markets, exacerbating volatility in the economy and financial systems. Moreover, crises intensify this spillover effect (Karanasos and Yfanti 2020; Karanasos, Yfanti, and Hunter 2022). On the other hand, external economic policy uncertainty undermines domestic growth and employment (Hwang and Suh 2021). The combined effect of external economic uncertainty and financial market disruptions can lead to capital flight, which raises borrowing costs and hinders the ability of policy banks to implement countercyclical policies. Additionally, external financial shocks can further deteriorate the asset quality of policy banks, impeding their capacity for sustainable operations and weakening their countercyclical regulatory function. This introduces greater caution in lending practices and diminishes their ability to counter economic cycles effectively.

2.3 Comparison of Loan Disbursements by Policy Banks and Commercial Banks

The screening processes for policy bank loans differ significantly from those of commercial bank loans, resulting in marked differences in their effectiveness in smoothing economic cycles. Policy banks also differ significantly from commercial banks in their approach to loan project screening. Specifically, policy banks place greater emphasis on the nature of the project, assessing whether it aligns with national strategic objectives. Commercial banks, on the other hand, focus more on the balance between risk and return, prioritizing the asset quality and repayment capacity of the borrowing enterprises. In the actual project selection process, applications for policy bank loans rely on a project repository mechanism. Enterprises or projects included in the repository typically require multi-level reviews by government departments and must complete compliance reviews in advance. This approach not only reduces information costs for policy banks but also enhances the creditworthiness of high-quality projects by leveraging government credit. In contrast, commercial bank loans are initiated through independent applications by enterprises. Banks use established risk control models—such as scorecard models—to automatically assign scores based on financial indicators and credit ratings, thereby automating the initial screening of loan projects.

In addition, commercial banks face significant risk exposures during crises, which increases the difficulty and cost of obtaining corporate loans. Consequently, commercial banks find it difficult to play a countercyclical regulatory role. First, during financial crises, there are risk interconnections among interconnected commercial banks, and shadow banking activities further exacerbate the vulnerability of the commercial banking system (Aliu, F., Bajra, U., & Hajrizi, E., 2026; Wang et al., 2021). Second, commercial banks typically use collateral to mitigate information asymmetries related to borrower quality (Krasniqi, B., Kotorri, M., & Aliu, F., 2023). However, during a crisis, the prices of corporate collateral assets plummet, and the increased risk of corporate default leads to risk-averse lending behavior on the part of commercial banks. Finally, heightened credit risk prompts banks to charge higher interest rates on loans to offset potential losses, thereby increasing the burden on firms during a crisis (Nuhiu, A., Aliu, F., & Hoti, A., 2024).

2.4 Theoretical Framework and Contributions

Building on Keynesian countercyclical policy theory and the literature on policy bank lending, this paper develops an analytical framework to examine the countercyclical characteristics of policy bank loans. In particular, it investigates how policy bank lending interacts with fiscal and monetary policies in stabilizing economic fluctuations, and under what conditions its countercyclical function may be strengthened or weakened.

Countercyclical policies are widely regarded as important instruments for smoothing business framework, and policy bank lending may serve as a distinctive form of policy-oriented finance. It functions not only as an extension of fiscal policy, but also as a channel through which credit resources can be allocated in line with macroeconomic stabilization objectives. Compared with commercial banks, policy banks are less constrained by short-term profit maximization and risky borrower creditworthiness, declining collateral values, and rising default risks. As a result, their willingness and capacity to expand credit may be significantly weakened precisely when credit support is most needed. By contrast, policy banks, given their mandate to support national development strategies and stabilize key sectors, are better positioned to provide medium- and long-term financing during periods of economic stress.

The countercyclical role of policy bank loans is therefore rooted in both their policy-oriented objectives and their financing structure. On the one hand, policy bank lending can help sustain aggregate demand, support employment, and stabilize investment by providing targeted credit to firms and projects that are aligned with public policy priorities. On the other hand, the increasing marketization and diversification of policy bank funding sources reduce their exclusive dependence on fiscal resources. This gives policy bank lending a certain degree of operational flexibility and enables it to complement traditional fiscal and monetary policies. In this sense, policy bank loans may operate as a quasi-fiscal and credit-based stabilization instrument, helping to alleviate the constraints faced by conventional a countercyclical instrument is not unconditional. Existing studies suggest that institutional quality, political credibility, public debt pressure, corruption, and external borrowing constraints can significantly influence the implementation and effectiveness of countercyclical policies. In countries or periods characterized by high political and economic risks, policy implementation may be distorted, financing conditions may deteriorate, and the capacity of policy banks to perform stabilization functions may be weakened. Conversely, when national political and economic risks are relatively low, policy banks are more likely to operate within a stable institutional and macroeconomic environment. Under such conditions, the countercyclical effect of policy bank lending is expected to be stronger.

In addition to domestic institutional and macroeconomic conditions, external risk shocks may also constrain the countercyclical lending mechanism of policy banks. External economic and financial uncertainty can affect policy bank lending through several channels. First, external shocks may intensify domestic macroeconomic and financial volatility, thereby increasing the difficulty of credit allocation and risk assessment. Second, external uncertainty may weaken domestic output growth and employment, reducing firms' repayment capacity and increasing credit risk. Third, heightened uncertainty may raise the cost of risk management for policy banks and limit their ability to expand lending. Fourth, external financial shocks may deteriorate the asset quality of policy banks, thereby reducing their risk-bearing capacity and weakening the sustainability of countercyclical credit support. Therefore, significant external economic and financial shocks are expected to dampen the countercyclical function of policy bank lending.

Based on this theoretical framework, this paper makes three main contributions to existing literature. First, it extends the literature on countercyclical policies by incorporating policy bank lending into the analysis of macroeconomic stabilization instruments. While existing studies have mainly focused on fiscal and monetary policies, this paper highlights the role of policy-oriented finance as a complementary mechanism for smoothing economic cycles. Second, it examines both domestic and external factors that condition the effectiveness of policy bank lending, thereby

providing a more comprehensive understanding of the circumstances under which policy bank loans can perform countercyclical functions. Third, it contributes to the micro-level literature on economic stabilization by investigating how policy bank lending affects firm operations, thereby linking macro-level policy instruments with enterprise-level outcomes.

3. Data and Model

3.1 Data

The data used in this study encompass China's A-share non-financial listed companies from 2005 to 2023. It provides a sufficient time frame to comprehensively analyze the performance of policy bank loans across several historical economic cycles. Specifically, data on policy bank loans were manually collected from the annual reports of listed companies, a process that required identifying and extracting the relevant information from each annual report. Policy bank loans typically feature long repayment periods and low interest rates, making their acquisition by listed companies generally viewed as a positive signal. Consequently, listed companies are willing to proactively disclose such loans in their annual reports to convey to the stock market that they align with national strategies and possess strong financing capabilities. In contrast, other data were obtained from the CSMAR and CNRDS databases. This study excludes the following observations: (1) pre-IPO firms, (2) companies in the financial sector, (3) firms designated as ST or PT in the sample year, and (4) enterprises with asset-liability ratios exceeding 100%. To mitigate the influence of outliers, all continuous variables are winsorized at the 1st and 99th percentiles. The distribution of loans is presented in Table 1.

Table 1 Statistical Overview of Loan Distribution.

Year	Number of loans	Number of loans to non-state enterprises	Number of loans to state-owned enterprises
2005	70	13	57
2006	95	19	76
2007	86	29	57
2008	195	47	148
2009	341	131	210
2010	297	132	165
2011	366	143	223
2012	372	158	214
2013	238	119	119
2014	82	27	55
2015	151	72	79
2016	182	110	72
2017	147	119	28
2018	90	66	24
2019	132	97	35
2020	165	116	49
2021	410	198	212
2022	397	189	208
2023	333	166	167

Note: This table presents the disbursement of policy bank loans from 2005 to 2023 and reveals their distribution.

3.2 Variables

Variable definitions are shown in Table 2.

Table 2 Variable definitions and descriptive statistics.

Variable type	Variable	Definition	N	mean	sd	min	max
dependent variable	debt	The natural logarithm of the amount of loans from policy banks	4845	10.4	1.765	5.549	14.54
independent variable	cycle	Economic cycle	4845	0.001	0.034	-0.055	0.079
controls variables	size	Firm size	4845	22.98	1.326	19.42	26.08
	lev	Leverage Ratio	4845	0.545	0.178	0.053	0.886
	roa	Return on Assets	4845	0.022	0.055	-0.245	0.188
	age	The natural logarithm of (company listing age + 1)	4845	2.394	0.732	0	3.367
	first	Shareholding ratio of the largest shareholder	4845	34.99	15.56	8.54	74.82
	soe	Nature of corporate equity	4845	0.548	0.498	0	1
	pgdp	Provincial GDP growth rate	4845	10.22	0.925	5.833	11.82
	m2growth	M2 growth rate	4845	0.125	0.042	0.081	0.284
	fiscalgrowth	Fiscal expenditure growth rate	4845	10.11	6.618	0	25.7

Note: This table presents the variables used in the empirical analysis, along with their definitions and measurement methods. The table also shows the number of observations, mean, standard deviation, maximum, and minimum values for each variable.

The explanatory variable in this study is the amount of policy bank loans held by enterprises, measured by the natural logarithm of the total annual holdings of policy bank loans. The independent variable, economic cycle, follows Yang, Dong, and Liang (2024), where the national GDP growth rate from 1990 to 2024 is processed using the Hodrick-Prescott Filter to eliminate the trend component and retain the cyclical component, serving as the measure of the economic cycle. Control variables include financial indicators such as firm size, leverage ratio, net asset margin, and internal governance factors like the nature of the firm's shareholding, the number of years since listing, and the shareholding of the largest shareholder. Additionally, we have controlled provincial GDP growth, M2 growth, and fiscal spending growth.

3.3 Theoretical model

The model focuses on the non-financial corporate sector (hereafter "firms") and assumes that all firms are homogeneous. Let current output be denoted by y_t, the capital stock inherited from the previous period by k_{t-1}, and the current asset price by q_t. Firms are assumed to have engaged in debt financing in the previous period, with outstanding liabilities b_{t-1}, which require repayment of principal and interest equal to $R*b_{t-1}$ in the current period. Ignoring depreciation and other adjustment costs for simplicity, firms' current net worth can be written as:

$$NW_t = y_t + q_t * k_{t-1} - R * b_{t-1} \quad (1)$$

Because firms are subject to collateral constraints, the size of their liabilities is limited by their assets. Following the framework established by Kiyotaki and Moore (1997), assuming that the firms' borrowing constraint is always binding, the lending process can be simplified as follows:

$$b_t = \theta * NW_t \quad (2)$$

Where θ>0 denotes the leverage parameter or the tightness of credit conditions. A higher θ implies looser collateral constraints and greater borrowing capacity.

The total value of capital available for investment in the current period is therefore:

$$q_t * k_t = NW_t + b_t \quad (3)$$

Substituting Equation (2) into Equation (3) yields:

$$q_t * k_t = NW_t + \theta * NW_t \quad (4)$$

which can be rearranged as:

$$k_t = \frac{(1+\theta)*NW_t}{q_t} \quad (5)$$

Assume that production follows a simple AK technology. Output in the next period is therefore given by:

$$y_{t+1} = a * k_t \quad (6)$$

Substituting Equation (5) into Equation (6) gives:

$$y_{t+1} = \frac{a*(1+\theta)*NW_t}{q_t} \quad (7)$$

Combining Equations (1) and (7), next-period output can be expressed as:

$$y_{t+1} = \frac{a*(1+\theta)}{q_t}(y_t + q_t * k_{t-1} - R * b_{t-1}) \quad (8)$$

Taking the partial derivative of y_{t+1} with respect to y_t, the intertemporal transmission coefficient is:

$$\frac{\partial y_{t+1}}{\partial y_t} = \frac{a*(1+\theta)}{q_t} \quad (9)$$

Equation (9) captures the amplification mechanism generated by financial frictions. The parameter θ reflects the degree of credit availability in financial markets. During economic expansions, financial institutions typically become less risk-averse and relax collateral constraints, increasing θ. Moreover, leverage tends to rise faster than asset prices, generating mutually reinforcing interactions between credit expansion and output growth (Geanakoplos 2010). In this framework, the financial accelerator amplifies output fluctuations and increases macroeconomic fragility.

The baseline model therefore implies that credit constraints are inherently procyclical. To analyze the stabilizing role of policy bank lending, this paper introduces a countercyclical policy bank lending mechanism. Following the logic of counter cyclical policy rules in the macro-finance literature (e.g. Angelini et al., 2014), policy banks are assumed to adjust credit supply in response to deviations of output from its steady-state level. Specifically, the leverage parameter becomes:

$$\theta(y_t) = \theta' - \gamma * (y_t - \bar{y}) \quad (10)$$

where θ' denotes the leverage ratio determined by market-based credit conditions, $\bar{y}$ is the steady-state level of output, and γ>0 measures the countercyclical adjustment intensity of policy bank lending.

When γ=0, there is no policy bank intervention, and credit conditions are entirely determined by the market sector. When $\gamma > 0$, policy bank lending operates counter cyclically. During an economic expansion ($y_t > \bar{y}$), policy bank loans decrease, thereby reducing the leverage ratio in the credit market. During economic downturns ($y_t < \bar{y}$), policy bank lending expands, mitigating the tightening of credit constraints and stabilizing investment.

Substituting Equation (10) into Equation (8) yields:

$$y_{t+1} = \frac{a*\left(1+\theta'-\gamma*(y_t-\bar{y})\right)}{q_t}(y_t + q_t * k_{t-1} - R * b_{t-1}) \tag{11}$$

Differentiating Equation (11) with respect to y_t gives:

$$\frac{\partial y_{t+1}}{\partial y_t} = \frac{a}{q_t} * (1 + \bar{\theta} - \gamma * NW_t) \tag{12}$$

Equation (12) shows that the intertemporal transmission coefficient decreases as the countercyclical adjustment parameter γ increases. Since firms' net worth is generally positive, the introduction of policy bank lending reduces the sensitivity of future output to current output fluctuations, thereby flattening the amplification mechanism generated by financial constraints.

The model therefore suggests that policy bank lending can stabilize the economy by intervening in the credit constraint alleviates credit tightening and supports investment and output stabilization. In this sense, policy bank lending functions as a countercyclical financial stabilization mechanism that complements conventional fiscal and monetary policies.

3.4 Regression Model

Theoretical analysis suggests that policy bank lending plays a vital economic stabilization role during downturns, particularly by increasing credit provision to firms when economic growth slows. To empirically test the countercyclical regulatory effect of policy bank loans, we focus on firms holding policy bank loans as our research sample. The study investigates how the economic cycle impacts the amount of policy bank loans, and designs a fixed-effects model for analysis. By incorporating firm-specific fixed effects, the model controls for unobservable heterogeneity at the firm level that remains constant over time. Then, interaction terms are introduced to analyze the effects of internal factors such as political and economic stability and tax revenue growth, along with external factors such as global financial uncertainty. Model (13) is used to verify the countercyclical properties of policy bank loans, while model (14) is used to test the factors affecting the countercyclical properties of loans.

$$Y_{i,t} = \beta_0 + \beta_1 cycle_t + \beta_2 Controls_{it} + \lambda_i + \varepsilon_{i,t} \tag{13}$$

$$Y_{i,t} = \beta_0 + \beta_1 cycle + \beta_2 cycle \times X + \beta_3 X + \beta_4 Controls + \lambda_i + u_{i,t} \tag{14}$$

where the explanatory variable $Y_{i,t}$ represents the natural logarithm of the total amount of policy bank loans received by firm *i* at time *t*. The independent variable cycle captures the economic $cycle_t$, while controls include all control variables. X is the moderating variable. The model also accounts for firm-level fixed effects λ_i, and $\varepsilon_{i,t}$ and $u_{i,t}$ are the error term.

4. Empirical analysis

4.1 Baseline regression

This study examines the countercyclical disbursement patterns of policy bank loans to corporations from 2005 to 2023, as outlined in equation (1). The results of the multiple regression analysis are presented in Table 3. Column (1) presents the results without control variables; Column (2) incorporates control variables; and Column (3) further adds individual fixed effects in conjunction with the control variables. To mitigate potential endogeneity issues arising from reverse causality, we employ the instrumental variable (IV) approach for robustness testing.

Table 3 Baseline Regressions Results.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				first		first	
VARIABLES	debt	debt	debt	cycle	debt	cycle	debt
cycle	-2.584***	-2.127***	-0.935***		-1.740***		-3.278***
	(-5.12)	(-3.84)	(-2.60)		(-2.67)		(-4.37)
lshock				-0.027***		-0.026***	
				(-69.98)		(-82.21)	
size		0.505***	0.305***	0.000	0.303***	0.000	0.328***
		(8.84)	(4.63)	(0.14)	(4.60)	(0.49)	(5.00)
lev		1.034**	0.454**	-0.002	0.460**	-0.004	0.327
		(2.41)	(2.17)	(-0.54)	(2.21)	(-0.92)	(1.53)
roa		-0.272	-0.189	0.031**	-0.135	0.030**	-0.160
		(-0.34)	(-0.48)	(2.55)	(-0.34)	(2.48)	(-0.40)
age		-0.029	-0.221**	-0.001	-0.228**	-0.001	-0.234**
		(-0.34)	(-2.06)	(-0.78)	(-2.12)	(-0.82)	(-2.20)
first		0.000	-0.005	-0.000***	-0.005	-0.000***	-0.006
		(0.01)	(-1.03)	(-3.25)	(-1.08)	(-3.33)	(-1.29)
soe		0.214*	0.006	0.002	0.012	0.001	-0.021
		(1.74)	(0.02)	(0.57)	(0.04)	(0.41)	(-0.08)
pgdp		-0.160**	0.389**	0.010***	0.377**	0.009***	0.259*
		(-2.17)	(2.55)	(4.89)	(2.46)	(3.87)	(1.72)
m2grow		-0.292	1.382**	-0.279***	1.018	-0.279***	0.606
		(-0.34)	(2.22)	(-32.53)	(1.39)	(-33.40)	(0.85)
fiscalgrowth		0.013*	-0.003	0.003***	-0.001	0.003***	-0.009**
		(1.88)	(-0.68)	(30.05)	(-0.39)	(23.38)	(-2.06)
oil						0.004***	0.338***
						(3.67)	(4.94)
Constant	10.407***	-0.273	-0.263				
	(147.66)	(-0.18)	(-0.14)				
Observations	4,845	4,845	4,845	4,776	4,776	4,776	4,776
LM statistic				444.150***		384.832***	
C-D Wald F statistic				5625.619		418.662	
R-squared	0.003	0.213	0.081		0.079		0.084
Adj. R-squared	0.00230	0.211	0.0788		-0.0888		-0.0832
F-statistic	26.23	23.12	7.196	4897	8.137	6759	10.10
Company FE	No	No	Yes	Yes	Yes	Yes	Yes
Controls	No	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust t-statistics in parentheses. ***, **, * represents significant level at 1%, 5% and 10% respectively, same as below.

We selected the oil production shock indicator developed by Lutx and Kilian (2009) and included it in the regression with a one-period lag(lshock). First, this indicator eliminates endogeneity issues arising from changes in oil prices, focusing solely on supply shocks caused by geopolitical factors and sudden production cuts. As it is unaffected by domestic economic cycles, it satisfies the requirement of exogeneity. Second, supply shocks such as oil production cuts affect global economic trends and are correlated with domestic business cycles. Finally, to isolate the direct cost effects of oil shocks, this study further controls for the logarithm of international crude oil prices(oil) in the regression. This ensures that the impact of oil price changes on corporate loan demand is excluded, allowing us to focus on the impact of the macroeconomic downturn triggered by energy supply contraction on corporate policy-based loans, thereby satisfying the exclusionary constraint.

The regression findings reveal that the coefficient for the economic cycle variable is significantly negative at the 1% level. This indicates that policy bank loans exhibit countercyclical behavior, which is during periods of economic expansion, the total holdings of policy bank loans by listed companies decline. While during economic contractions, there is a substantial increase in the total amount of policy bank loans. This conclusion is consistent with the perspective advanced by Yuan, Zhou, and Zou (2022) which asserts that state-owned banks, in accordance with government directives, play a crucial role in stabilizing the economy by providing countercyclical credit.

The instrumental variable (IV) approach results are presented in columns (4) through (7) of Table 3. The results indicate that using a one-period lagged oil production shock as an instrumental variable passes the weak instrumental variable test. Furthermore, after replacing the instrumental variable and adding control variables, a significant negative correlation still exists between the economic cycle and the holdings of policy-based bank loans, thereby validating the countercyclical regulatory role of policy-based bank loans. The regression outcomes for instrumental variable confirm that, during economic downturns, the disbursement of policy bank loans increases the stock of such loans held by enterprises, thereby contributing to economic stabilization.

4.2 The effect of internal & external factors

4.2.1 Internal Influencing Factors

National institutions play a pivotal role in determining the effectiveness of countercyclical economic policies. Strong institutional frameworks enhance policy implementation and transmission, whereas institutional weaknesses constrain policy effectiveness. In countries characterized by institutional deficiencies like limited access to international capital markets, underdeveloped financial systems, weak political credibility, and pervasive corruption, the capacity of which to deploy fiscal and monetary instruments effectively to stabilize economic fluctuations is significantly impaired (Calderón, Duncan, and Schmidt-Hebbel 2016; Mackiewicz 2023). Therefore, it is essential to study the impact of national institutions on the countercyclical nature of policy bank loans.

The composite risk rating provided by the International Country Risk Guide (ICRG) offers a comprehensive measure of a country's political, economic, and financial stability, encompassing both internal and external risk factors. A higher composite risk rating reflects greater macroeconomic and institutional stability, as well as a stronger capacity to implement countercyclical policies. Conversely, elevated country risk constrains governments' policy space, thereby weakening the effectiveness of countercyclical interventions and potentially rendering

policy bank lending more procyclical.

Table 4 Internal Factor Analysis of Risk

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	debt	debt	debt	debt	debt	debt	debt	debt
cycle	55.981***	35.046***	32.548***	19.624***	141.031***	87.889***	-1.529***	-1.740***
	(5.25)	(3.06)	(5.23)	(3.10)	(7.04)	(4.35)	(-3.90)	(-4.29)
cycle×Composite	-0.761***	-0.481***						
	(-5.29)	(-3.09)						
Composite	-0.081***	-0.038**						
	(-5.29)	(-2.14)						
cycle×Political			-0.551***	-0.339***				
			(-5.40)	(-3.19)				
Political			-0.041***	-0.013*				
			(-5.17)	(-1.65)				
cycle×Economic					-3.526***	-2.206***		
					(-7.07)	(-4.37)		
Economic					-0.191***	-0.106***		
					(-6.98)	(-4.32)		
cycle_taxgrowth							-66.182***	-22.621**
							(-5.42)	(-2.20)
taxgrowth							-0.405	2.110***
							(-0.65)	(5.16)
Constant	16.306***	4.081	12.839***	1.680	18.058***	5.919**	10.430***	-0.772
	(14.63)	(1.51)	(27.32)	(0.81)	(16.48)	(2.55)	(1,560.24)	(-0.42)
Observations	4,845	4,845	4,845	4,845	4,845	4,845	4,845	4,845
R-squared	0.049	0.084	0.044	0.084	0.040	0.089	0.014	0.088
Adj. R-squared	0.0480	0.0820	0.0431	0.0817	0.0391	0.0864	0.0137	0.0862
F-statistic	17.39	6.618	17.08	6.416	22.58	7.965	14.06	10.19
Controls	No	Yes	No	Yes	No	Yes	Yes	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table presents the model estimated using Equation (14). By incorporating interaction terms for the national comprehensive risk rating, national political risk rating, national economic risk rating, and national tax growth, it demonstrates how domestic factors influence the countercyclical nature of policy bank loans.

To empirically examine this relationship, we introduce an interaction term between the country's composite risk rating (Composite) and policy bank loan holdings in the regression model. The results presented in columns (1) and (2) of Table 4 show that when a country's comprehensive risk rating is higher, the countercyclical effect of its policy bank loans becomes more pronounced. It suggests that stronger institutional and macroeconomic stability are more closely linked to the countercyclical effect.

Furthermore, to disentangle the underlying channels, we incorporate additional interaction terms between policy bank loan holdings and the country's political risk rating (Political) and economic risk rating (Economic), respectively. The corresponding results, presented in columns (3)-

(6) of Table 4, suggest that both political and economic stability significantly strengthen the countercyclical function of policy bank lending. These findings further corroborate the conclusions of Calderón et al. (2016) and Mackiewicz (2023). And these underscore the importance of institutional quality in enhancing the stabilizing role of policy-based financial instruments. Additionally, this study explores the impact of tax revenue growth on the countercyclical nature of policy bank loans. Tax revenue growth, measured by the growth rate of China's tax revenue as a percentage of GDP, is analyzed in Column (7) and (8) of Table 4. The results indicate that when tax revenue growth is higher, the countercyclical adjustment effect of policy bank loans is stronger. This indicates that a better fiscal revenue outlook can enhance the effectiveness of policy bank intervention measures.

4.2.2 External Influencing Factors

More critically, we investigate how external risk shocks condition the countercyclical behavior of policy bank lending. It suggests that unstable funding sources weaken the operational capacity of national investment banks (Mazzucato. and Macfarlane 2023). In addition, economic policy uncertainty (EPU) has been shown to affect banks' liquidity creation (Berger et al. 2022), while financial market volatility, as proxied by the VIX, influences cross-border capital flows and capital costs (Weston and Yimfor 2023). These channels may constrain the ability of policy banks to implement countercyclical adjustments.

To quantify external economic uncertainty, we employ the Economic Policy Uncertainty (EPU) index developed by Davis (2016). Specifically, we construct both an unweighted average and a GDP-weighted average of the EPU indices for G7 economies to capture external economic risk exposure. The interaction terms between external economic uncertainty and the countercyclical indicator are incorporated into the baseline regression model. The corresponding results are reported in columns (1)-(4) of Table 5.

We further assess the impact of external financial shocks. External financial risk is measured using the Chicago Board Options Exchange Volatility Index (VIX), a widely used proxy for global financial market uncertainty. The interaction term between the VIX and the countercyclical variable is added to the regression specification, with the results presented in columns (5) and (6) of Table 5.

The empirical findings reported in Table5 indicate that elevated levels of external risk significantly attenuate the countercyclical effect of policy bank lending. In other words, although policy banks are capable of providing countercyclical support under normal conditions, their stabilizing function diminishes in the presence of heightened global economic uncertainty or financial market volatility. These findings align with the research by Aastveit et al. (2017) and Lien, Sun, and Zhang (2021), which indicate that external shocks can undermine the effectiveness of policies and reduce their impact. External risk shocks not only complicate the domestic macroeconomic environment but also constrain the effectiveness of internal countercyclical mechanisms. In sum, while domestic institutional capacity, sovereign risk conditions, and fiscal stability remain fundamental determinants of countercyclical effectiveness, external shocks exert a non-negligible dampening effect on the stabilizing role of policy bank lending. These results highlight the structural vulnerability of policy banks to global economic and financial uncertainty, which may limit their ability to smooth domestic business cycle fluctuations.

Table 5 External Risk Shocks Analysis.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	debt	debt	debt	debt	debt	debt
cycle	-10.954***	-6.252***	-13.182***	-8.119***	-5.506***	-8.498***
	(-5.95)	(-3.14)	(-6.44)	(-3.60)	(-2.88)	(-4.19)
cycle×EPU	0.055***	0.029***				
	(5.74)	(2.89)				
EPU	0.003***	0.001*				
	(5.07)	(1.91)				
cycle×EPU _weighted			0.072***	0.041***		
			(6.17)	(3.37)		
EPU _weighted			0.004***	0.002***		
			(5.39)	(2.66)		
cycle×VIX					0.172**	0.362***
					(2.13)	(3.97)
VIX					-0.004	-0.006*
					(-1.54)	(-1.95)
Constant	9.752***	1.234	9.681***	1.614	10.490***	-0.579
	(74.79)	(0.66)	(71.42)	(0.87)	(199.28)	(-0.32)
Observations	4,845	4,845	4,845	4,845	4,845	4,845
R-squared	0.044	0.084	0.047	0.085	0.009	0.088
Adj. R-squared	0.0433	0.0818	0.0460	0.0832	0.00874	0.0856
F-statistic	15.86	6.251	16.77	6.382	9.101	7.736
Controls	No	Yes	No	Yes	No	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table estimates the model based on Equation (14). By including interaction terms for economic policy uncertainty, GDP-weighted economic policy uncertainty, and the VIX, respectively, it demonstrates how external factors influence the countercyclical effectiveness of policy bank loans.

4.3 Relationship with fiscal and monetary policies

Next, we examine the relationship between policy bank loans and fiscal and monetary policies to determine whether they are complementary. Kollmann, Roeger, and Veld (2012) demonstrated that bank credit can serve as an effective complement to fiscal policy. Based on this, we measure the intensity of monetary and fiscal policies using the natural logarithm of M2 (lnM2) and the ratio of fiscal expenditure to GDP (fiscalratio), respectively. By incorporating the interaction term between policy intensity and the economic cycle into the regression model, the results are presented in Table 6.

Table 6 Relationship Analysis with Fiscal and Monetary Policies.

	(1)	(2)	(3)	(4)
VARIABLES	debt	debt	debt	debt
cycle	-24.069***	-21.565**	-32.090***	-20.025***
	(-3.15)	(-2.44)	(-5.68)	(-3.98)
cycle×lnM2	1.631***	1.464**		
	(3.05)	(2.39)		
lnM2	0.365***	0.235		
	(4.73)	(1.06)		
cycle×fiscalratio			143.666***	88.410***
			(5.52)	(3.84)
fiscalratio			4.137**	1.012
			(2.20)	(0.55)
Constant	5.221***	-1.328	9.512***	0.477
	(4.76)	(-0.64)	(22.58)	(0.26)
Observations	4,845	4,845	4,845	4,845
R-squared	0.050	0.083	0.023	0.085
Adj. R-squared	0.0493	0.0806	0.0224	0.0823
F-statistic	16.13	6.155	15.48	6.763
Controls	No	Yes	No	Yes
Company FE	Yes	Yes	Yes	Yes

Note: This table estimates the model based on Equation (14). By including interaction terms for monetary policy and fiscal policy, respectively, it demonstrates the complementary relationship between policy bank loans and monetary and fiscal policies.

The findings reveal that the interaction term between policy intensity and the economic cycle is significantly positive. This indicates that when both monetary or fiscal policies become more restrictive, the countercyclical nature of policy bank lending becomes more pronounced. The research results indicate that there is a complementary effect between policy bank loans and traditional policies. When the intensity of monetary and fiscal policies is relatively low, policy bank loans exhibit stronger countercyclical regulatory effects and can serve as an alternative to monetary and fiscal policies during stable cycles.

Furthermore, we use a threshold model to examine the nonlinear relationship between fiscal and monetary policies and the countercyclical characteristics of policy bank loans. The single threshold model is constructed as follows.

$$Y_{i,t} = \beta_0 + \beta_1 cycle \times I(q_{i,t} \le \gamma_1) + \beta_2 cycle \times I(q_{i,t} > \gamma_1) + \beta_3 Controls + \lambda_i + \varepsilon_{i,t} \quad (15)$$

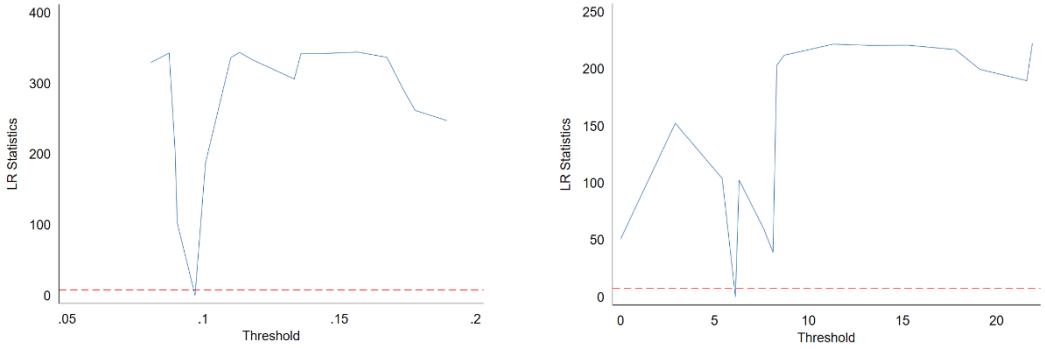
In model 3, q_{it} is the threshold variable, γ is the threshold value, and $I(\cdot)$ is the index function. Using m2growth and fiscalgrowth as threshold variables respectively, we conducted triple-threshold, double-threshold, and single-threshold analyses. M2growth exhibited significant double-threshold effects, while fiscalgrowth showed significant triple-threshold effects. Considering the length requirement of the years within the threshold interval, we ultimately determined that a single threshold effect exists. The results are shown in Table 7, and the likelihood ratio test results are

shown in Figure 1.

Table 7 Threshold effect test results.

Threshold variables	Threshold	F stat	Prob	Crit10	Crit5	Crit1
m2growth	0.097	312.88***	0	3.987	4.948	6.682
fiscalgrowth	6.1	202.43***	0	4.353	5.127	7.815

Note: This table presents the threshold values estimated by the threshold effect model. It also provides the threshold values, F-statistics, p-values, and critical values for the single-threshold model.



(a) Single threshold of m2growth LR. (b) Single threshold of fiscal growth LR.

Figure 1 LR test.

Note: This figure shows the LR plot for the threshold effect model. When the LR curve lies below the dashed critical line, it indicates that the estimated threshold is valid.

Table 8 Threshold effect regression results.

Variables	Coef.	Robust Std. Err.	t	P > |t|	[95 % Conf.	Interval]
Panel A: m2growth as the threshold variable						
cycle (*m2growth* ≤0.097)	-12.293	1.214	-10.130	0.000	-14.676	-9.909
cycle (*m2growth* > 0.097)	12.401	0.830	14.940	0.000	10.771	14.031
Constant	1944.756	4.660	417.330	0.000	1935.604	1953.908
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes
Panel B: fiscalgrowth as the threshold variable						
cycle (*fiscalgrowth*≤6.1)	-6.196	0.676	-9.160	0.000	-7.523	-4.868
cycle (*fiscalgrowth* > 6.1)	10.651	0.697	15.280	0.000	9.282	12.019
Constant	1943.651	4.694	414.070	0.000	1934.432	1952.870
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table estimates the model based on Equation (15) and presents the results of the threshold effect model. The table reveals the differences in the impact of the economic cycle on the amount of policy bank loans when the threshold variables (m2growth and fiscalgrowth) fall within different intervals.

Table 8 shows that using m2growth as the threshold variable divides the sample into two regimes. When m2growth ≤ 0.097, the coefficient on cycle is -12.293 ($p < 0.001$); when m2growth > 0.097, the coefficient becomes 12.40. A similar pattern holds for fiscalgrowth: when fiscalgrowth ≤

6.1, cycle is significantly negatively correlated with policy bank loans; when fiscalgrowth > 6.1, the coefficient rises to 10.65. These results suggest that policy bank loans play a stronger countercyclical role when monetary or fiscal policy is weak, indicating a complementary relationship between policy bank lending and traditional macroeconomic tools.

4.4 Robustness Tests

4.4.1 Long-term cycles and policy bank loan disbursements

In addition to using annual economic cycles as independent variables, this paper also examines the impact of long-term economic cycles on loan issuance. When the economic cycle remains below zero for three consecutive years, it is defined as a long-term downturn, with the dummy variable low set to 1 otherwise 0. Similarly, when the economic cycle remains above zero for three consecutive years, it is defined as a long-term upturn, with the dummy variable high set to 1 otherwise 0. Adding high and low as independent variables to the regression yields the results shown in Table 9, columns (1) and (2).

Table 9 Robustness Checks.

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	debt	debt	debt	debt	debt	debt
high	-0.548***					
	(-4.29)					
low		0.137***				
		(3.12)				
PMI			-0.030**			
			(-2.02)			
credit				-0.507***		
				(-3.37)		
cycle					-2.686***	-1.036**
					(-4.46)	(-2.37)
Constant	2.301	-1.202	1.819	-2.263	10.357***	4.772**
	(1.25)	(-0.65)	(0.84)	(-1.11)	(140.20)	(2.25)
Observations	4,845	4,845	4,845	4,845	3,282	3,282
R-squared	0.093	0.084	0.080	0.087	0.002	0.035
Adj. R-squared	0.0909	0.0826	0.0783	0.0851	0.00209	0.0316
F-statistic	8.205	8.033	5.880	7.953	19.87	3.960
Controls	Yes	Yes	Yes	Yes	No	Yes
Company FE	Yes	Yes	Yes	Yes	No	Yes

Note: This table presents the results of robustness tests, demonstrating the estimated relationships between the economic cycle and policy bank loan amounts by varying the length of the economic cycle, PMI, credit cycle, and sample period. The results indicate that long-term upward cycles are negatively correlated with loan holdings at the 1% significance level, while long-term downward cycles are positively correlated at the 1% significance level. This suggests that during prolonged economic downturns, policy banks extend more loans to enterprises to support the economy, validating the robustness of the conclusion that policy bank lending stabilizes credit.

4.4.2 Substitution of Dependent Variables

We further tested the robustness of our findings by substituting cyclical indicators. (1) As a measure of manufacturing activity, the PMI's predictive power for economic cycles has been confirmed by numerous studies (Lahiri and Monokroussos 2013). Higher values indicate stronger economic conditions. (2) The financial cycle is measured by the ratio of credit to GDP (Wang and Xiao 2023). The regression results with substituted dependent variables are presented in columns (3) and (4) of Table 9.

The results indicate that during periods of low economic activity, firms hold a greater volume of policy bank loans. These alternative specifications align with the baseline regression findings, further confirming the countercyclical adjustment characteristics of policy bank lending.

4.4.3 Adjusting the Sample Time Range

The baseline regression utilized loan data from 2005 to 2023 as the research sample. While longer-term data better explores the efficacy of policy banks' stabilization cycles, it may overlook the characteristics of policy bank lending under China's new economic conditions in recent years. At the end of 2013, the annual Central Economic Work Conference first proposed that China had entered a new normal of development. The economy shifts from high-speed to medium-high-speed growth and transitions from factor-driven and investment-driven development to innovation-driven development. Based on this, this paper modifies the research sample time range, reanalyzing the data using the 2014-2023 sample. The results are shown in Table 9 columns (5) and (6). The study finds that over the past decade, policy bank lending continues to exhibit countercyclical characteristics, supporting enterprise development during economic downturns.

4.4.4 Heckman two-stage regression

To address sample selection bias, this study employs the Heckman two-stage method, with specific equations shown in Formulas (4) and (5). Formula (4) represents Heckman's first-stage selection equation, where the explanatory variable is whether the firm holds policy-backed bank loans (debtdum), a binary dummy variable indicating loan acquisition. Z is the exclusion restriction variable, and η_j represents the industry fixed effect. The exclusion restriction variable Z must only influence the probability of a firm obtaining policy bank loans without directly affecting the loan amount.

Unlike commercial bank loan applications, the disbursement of loans from policy-based banks follows a bottom-up approach, with borrowing enterprises or projects typically requiring government endorsement to be approved and included in the loan pool. As the most basic administrative reporting units and credit-bearing entities, county-level governments play a crucial role. On the one hand, the number of counties within each province determines the number of administrative channels available to provincial governments when competing for national credit resources, which in turn affects the province’s capacity to channel credit to the grassroots level. On the other hand, a larger number of counties also means greater access to projects within the province, thereby increasing the efficiency of information matching for local policy bank loan projects. At the same time, it reduces information asymmetry between banks and enterprises, consequently enhancing enterprises’ chances of securing loans. Furthermore, the number of counties within a province merely provides access opportunities for obtaining policy bank loans. The specific loan amounts for individual projects still depend on the characteristics of the enterprises and projects and are not correlated with the number of counties. Therefore, it is reasonable to use the number of county-level administrative divisions in each province as the instrumental variable (IV). Since urban

districts are typically coordinated by prefecture-level cities and lack administrative and fiscal independence, the number of urban districts is not included in the statistical scope. Additionally, to eliminate any correlation between the number of county-level administrative divisions and current economic development, we use the 1982 administrative boundaries. Since Hainan and Chongqing were approved as a province and a municipality directly under the central government in 1988 and 1997, respectively, the number of counties in these two regions is calculated from the year of their establishment, and the districts belonging to these two regions are excluded from the 1982 data for Guangdong and Sichuan.

We conducted a regression using the logarithm of the historical number of counties per province as the instrumental variable (IV), with the results shown in Table 10. Regression analysis employs the Probit model to calculate the inverse Mills ratio (IMR) according to Equation (17). Equation (18) represents the second-stage outcome equation, incorporating the inverse Mills ratio (IMR) into the regression analysis.

$$\Pr(debtdum_{it}) = \Phi(\theta_0 + \theta_1 cycle_t + \theta_2 Controls_{it} + \theta_3 Z + \eta_j + \varepsilon_{it}) \tag{16}$$

$$Lndebt_{it} = \varphi_0 + \varphi_1 cycle_t + \varphi_2 IMR_{it} + \varphi_3 Controls_{it} + \alpha_i + u_{it} \tag{17}$$

Table 10 Heckman Two-Stage Regression Results.

	(1)	(2)
	first	second
VARIABLES	debtdum	lndebt
cycle	-0.373*	-2.821***
	(-1.80)	(-3.80)
IMR		9.145***
		(4.27)
number	0.069**	
	(2.55)	
Constant	-5.191***	-57.684***
	(-9.96)	(-5.30)
Observations	50,779	50,539
R-squared		0.587
Adj. R-squared		0.542
F-statistic		25.42
Controls	Yes	Yes
Industry FE	Yes	No
Company FE	No	Yes

Note: This table estimates the model using Equations (16) and (17) based on data from Chinese A-share listed companies from 2005 to 2023 (selecting listed companies with and without loans using the same screening criteria as the original sample), and presents the coefficients from Heckman's two-stage regression along with robust z-statistics in parentheses.

The regression results in columns (1) of Table 10 shows after controlling for a province's level of economic development, provinces with a greater number of county-level administrative divisions

have a higher probability of enterprises holding loans from policy banks. And the regression results in columns (2) of Table 10 shows that the coefficient of the inverse Mills ratio (IMR) is significantly positive, indicating the presence of sample selection bias. After incorporating the inverse Mills ratio, the economic cycle continues to exert a significant negative impact on loan issuance, consistent with the benchmark results. This confirms that policy bank lending retains significant counter cyclicality even after correcting for sample selection bias.

4.5 Impact of Policy Bank Loans

Furthermore, we delved into whether policy bank loan disbursements can help enterprises navigate economic cycle fluctuations. Distinguishing between short-term and long-term effects, we examined the short-term announcement effect of policy bank loans and their long-term impact on firm value.

4.5.1 Short-Term Announcement Effect

In a rational stock market, investors are expected to respond positively to favorable news. Consequently, during economic downturns, positive developments can bolster investor confidence (Cenesizoglu 2015), mitigate panic-driven declines in stock prices, and thereby attenuate the adverse effects of economic volatility.

Policy bank loans are predominantly composed of medium- to long-term funds, which play a crucial role in addressing the long-term capital shortfall faced by enterprises. By providing patient and sustained financial support, these loans contribute to stability in the private sector (De Menezes Barboza and Vasconcelos 2019; Mazzucato. and Macfarlane 2023). Additionally, the low-interest nature of these loans alleviates the corporate debt burden, thereby sending positive signals about corporate financing conditions to the stock market.

Moreover, policy banks align their lending practices with national strategic objectives by selectively funding enterprises or projects that contribute to these goals. Consequently, the disbursement of loans signals that a company's development is in accordance with national strategic requirements, enhancing its perceived legitimacy and growth prospects. Furthermore, the endorsement provided by policy banks enhances the credibility of the companies they finance. These institutions, recognized for their rigorous risk assessment processes, serve as external validators of corporate quality. Their lending behavior therefore conveys positive signals to the market regarding the viability and reliability of borrowing firms (Weston and Yimfor 2023; Ross 2010). As a result, the market's short-term reaction to policy bank loans should be positive.

To examine the market's short-term reaction to policy bank loans, this study analyzes loan announcements from 2000 to 2024. It calculates the buy-and-hold abnormal return (BHAR) with observation windows of [0,0], [0,5], and [0,10] to assess the immediate market response to policy bank lending. The results are presented in Table 11.

$$BHAR_{i,t} = \prod_{t=0}^{T}(1+R_{i,t}) - \prod_{t=0}^{T}(1+R_{im,t}) \tag{18}$$

Table 11 T-Test Results for Abnormal Returns in Buy-and-Hold Strategies.

Window	N	Mean	t-value	p-value
[0,0]	2,263	0.0014406	2.369	0.0109
[0,5]	2,260	0.003333	1.9174	0.0277
[0,8]	2,258	0.0033456	1.7643	0.0389

Note: This table presents the results of t-tests for abnormal returns in buy-and-hold strategies calculated using Equation (18) across different holding periods, showing the observed values, means, t-values, and p-values.

The results indicate that companies announcing policy bank loans exhibit significantly positive abnormal returns on the day of disclosure, with the mean return increasing as the holding period lengthens. This suggests a positive market reaction to companies securing policy bank loans. Consequently, the issuance of policy bank loans constitutes favorable news that can boost listed companies' stock prices in the short term, thereby mitigating the impact of economic downturns on the stock market.

4.5.2 Impact on Actual Value

From a corporate operations perspective, policy bank loans enhance corporate value and stabilize the economy by aligning funding needs, facilitating monetary transmission, and expanding effective investment. These loans support national medium-to-long-term economic strategies (Ru and Yang 2025), focusing on long-term projects. They play a role in developmental finance, not only supplying capital but also attracting social and private investments, which reduces operational risks and alleviates financial pressures (Mazzucato 2016). Moreover, policy bank loans generate spillover effects across supply chains (Ru 2018). Consequently, loans from policy banks can enhance corporate value.

Table 12 Analysis of the Relationship Between Policy Bank Loans and Corporate Value.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
			Kernel Matching		Caliper Matching		IV method	
VARIABLES	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	TobinQ	post	TobinQ
post	0.050**	0.048**	0.055**	0.052**	0.055**	0.052**		2.216***
	(2.22)	(2.32)	(2.44)	(2.50)	(2.44)	(2.50)		(2.67)
Lagged TobinQ		0.107**		0.105**		0.105**		
		(2.34)		(2.35)		(2.35)		
IV							0.001***	
							(29.90)	
Constant	13.684***	13.745***	13.797***	13.748***	13.797***	13.749***		
	(15.93)	(15.70)	(16.84)	(16.63)	(16.84)	(16.63)		
Observations	43,799	38,934	42,837	38,065	42,836	38,064	4,776	43,205
LM statistic							14.810***	
C-D Wald F statistic							48.978	
R-squared	0.326	0.380	0.323	0.376	0.323	0.376		0.169
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Company FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: This table estimates the impact of holding policy bank loans on firm value using a two-way fixed-effects model, the PSM-DID method, and the IV method, presenting the estimated coefficients and robust t-statistics in parentheses.

Therefore, this study employs the Tobin's Q ratio (TobinQ) as the dependent variable to measure corporate value. The independent variable is whether the firm received policy bank loans in the current year, while control variables from prior analyses are retained. The regression also includes the previous year’s corporate value as a control. The results, shown in Table 12, columns (1) and (2), reveal a significant positive correlation between policy bank loan disbursements and

corporate value, which persists even after controlling for the previous year's Tobin's Q (Lagged TobinQ).

To address potential selection bias in loan disbursements, this study employs Propensity Score Matching (PSM-OLS). Using lagged control variables as matching variables, both Kernel Matching and Caliper Matching methods are applied.

The results, presented in columns (3) to (6) of Table 12, confirm a positive correlation between loan disbursements and corporate value, highlighting the role of policy bank lending in promoting corporate growth.

To further validate this conclusion, an instrumental variables test is conducted. Given that state-owned banks tend to allocate loans based on industry preferences (Lazzarini et al. 2015; Ru and Yang 2025), the study uses the average amount of policy bank loans obtained by other firms within the same industry in the same year as an instrumental variable, satisfying both correlation and exogeneity conditions. The results, presented in columns (7) and (8) of Table 12, further confirm the positive impact of policy bank loans on corporate value enhancement.

5. Conclusion

This study provides evidence on the stabilizing function of policy bank loans in the Chinese economy. Our empirical analysis confirms that these loans act as a robust countercyclical mechanism, effectively bridging the gap when traditional fiscal and monetary interventions are hampered by solvency constraints or liquidity traps. By providing a reliable financial buffer, policy bank lending preserves corporate value during economic contractions and prevents the destructive effects of procyclical behavior among listed firms. Furthermore, the evidence highlights that this stabilization capacity is not absolute; rather, it is contingent upon domestic institutional quality and is sensitive to the headwinds of global financial uncertainty.

These results carry significant implications for macroeconomic governance and institutional design. Policymakers should consider formally integrating policy bank lending into the broader countercyclical toolkit. Furthermore, they should recognize these institutions as strategic "first responders" during periods when the transmission of conventional monetary policy is weakened. However, the effectiveness of this lending is deeply intertwined with political stability and tax revenue growth. So, maintaining high-quality domestic institutions is a prerequisite for ensuring that policy finance reaches the real economy efficiently. Moreover, given that global volatility can dampen the domestic benefits of these loans, regulators must remain vigilant of external shocks. And it should potentially scale policy bank interventions more aggressively when international markets are in turmoil to offset the diminishing marginal returns of domestic efforts.

While this research provides a new perspective on China’s financial stabilization, several avenues for future refinement remain. A primary limitation of this study is its focus on publicly listed entities, which often possess greater transparency and state-level support than SMEs; future research should investigate whether the stabilizing hand of policy banks extends to non-listed firms that face more acute credit constraints. Additionally, while the Chinese model offers a unique laboratory for studying policy finance, the generalizability of these findings to other nations with different banking structures remains a subject for further cross-country comparison. Finally, while we have established the short-term stabilization benefits of these loans, the long-term impacts on the asset quality of policy banks and the potential for creating "zombie firm" dependencies warrant continued academic scrutiny. Such investigations would ensure that the "silent strength" of policy

banks does not inadvertently lead to fiscal vulnerabilities in the decades to come.

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