# Macroeconomic Drivers of Financing Default Risk among Chinese SMEs

Shengtian Ding *

Besant Hill School of Happy Valley, 8585 N Ojai Rd, Ojai, CA 93023, United States

* Corresponding Author Email: dvdst1019@gmail.com

**Abstract.** This paper studies how macroeconomic conditions shape the financing default risk of small and medium-sized enterprises (SMEs) in China. We focus on a simple transmission chain from GDP growth, interest rates, prices (CPI/PPI), exchange rates, labor-market conditions, and broader financial conditions to firm cash flow, balance sheets, and the probability of default. Methodologically, we synthesize recent policy and empirical literature and propose a province–industry quarterly panel using SME default proxies (inclusive-loan NPL/overdue ratios, small-cap PDs, and accounting distress flags), with fixed effects, distributed lags, panel-VAR, and event-based identification around policy moves. Results indicate that slower growth, higher rates, weak producer prices, exchange-rate volatility, and rising unemployment elevate default risk by compressing revenue, raising financing costs, lowering collateral values, and tightening credit availability. Policy buffers—targeted guarantees, inclusive-finance tools, and macro-consistent stress testing—mitigate but do not fully offset demand softness. We conclude with practical steps for government (market-based financing and early-warning systems), lenders (cash-cycle-matched products, risk sharing, FX-hedge toolkits), and firms (cash forecasting, funding diversification, hedging). The design enables estimation of effect sizes under coherent stress scenarios and offers a tractable framework for ongoing monitoring and policy calibration.

**Keywords:** Macroeconomic Drivers, Financing Default Risk, Chinese SMEs.

## 1. Introduction

SMEs are widely recognized as the backbone of China's real economy. Official statements emphasize that the private sector—largely composed of SMEs—accounts for roughly 90% of firms, over 50% of tax revenue, above 60% of GDP, more than 70% of technological innovation, and over 80% of urban employment, underscoring their centrality to growth, jobs, and innovation. Yet structural frictions—thin collateral, short credit histories, and information asymmetry—make SMEs sensitive to macro shocks that alter cash flows, borrowing costs, and roll-over conditions. Global financial-stability assessments in 2025 highlight tighter conditions and higher uncertainty as persistent features that raise corporate default risk, especially for smaller firms with limited buffers [1].

Domestically, monetary policy in 2025 has been supportive: the PBOC reports declines in average corporate loan rates and continued expansion of inclusive MSME lending, which help cushion refinancing pressure even as demand and margins remain under strain. Meanwhile, price data show a mix of soft CPI and weak PPI into mid-2025, signaling fragile pricing power for industrial firms and potential pressure on upstream margins. In this setting, understanding how macro factors translate into SME financing defaults is both analytically and practically important [2].

Research questions. (i) How do macroeconomic factors affect SMEs' financing default risk? (ii) Which drivers matter most under current Chinese conditions? (iii) Through which mechanisms—demand, costs, financing conditions—do these effects materialize?

## 2. Literature Review

### 2.1. Overseas research

Classic work on distress prediction begins with Altman's Z-score, which combines financial ratios to flag failure risk; while simple, it remains a baseline for small-firm screening. Subsequent generations model default intensities directly and embed macro variables for stress testing. Supervisory practice in Europe now routinely evaluates bank portfolios under coherent scenarios combining GDP, unemployment, interest rates, and market shocks, and research generally finds that contractionary policy and adverse macro shocks raise firm-level probabilities of default (PD) [3].

### 2.2. Domestic research

Chinese policy documents and monetary reports have tracked inclusive-finance flows, SME loan pricing, and credit structure, emphasizing targeted tools that can mitigate stress without diluting risk discipline. Pandemic-era surveys and follow-up studies document how lockdowns and demand collapses translated into revenue shocks, closures, and heightened credit risk for small businesses, validating the demand–cash-flow–default chain [4]

### 2.3. Gaps

Three key gaps are particularly notable. First, a large number of studies still focus on macro-level correlations or sector-specific analyses, while there is a lack of in-depth exploration into how shocks propagate through the working-capital cycles (encompassing receivables and inventories) and impact the collateral values of small and medium-sized enterprises (SMEs). Second, the interactions between different driving factors—such as sluggish demand, elevated interest rates, and foreign exchange (FX) volatility—are frequently examined in isolation, rather than being integrated into a unified analytical framework. Third, China's post-pandemic economic conditions, characterized by soft consumer prices, periods of negative Producer Price Index (PPI), and shifting external demand, may alter the relative significance of the driving factors emphasized in earlier models. This necessitates the use of recent data to conduct updated, China-tailored calibrations [5].

## 3. Theoretical Framework and Analytical Model

### 3.1. Foundations

From macroeconomics, the business-cycle and policy-transmission view links aggregate demand, real rates, and income to corporate earnings and investment. From finance, credit-risk theory models PD as co-moving with systematic factors (growth, unemployment, interest rates, prices). From corporate finance, SMEs face stronger financing constraints and information frictions, accelerating pass-through from macro shocks to cash flow, inventories, payables, and ultimately default risk.

### 3.2. Framework

We adopt a layered transmission chain: Macro factors (GDP growth, interest rates, CPI/PPI, exchange rate, unemployment, financial conditions) → Operating environment (demand, input costs, collateral values, credit availability) → Firm cash flow & balance sheet (EBITDA, interest coverage, working capital) → Repayment capacity → Financing default risk (PD/NPL probability) [6-8].

Supervisory policy, fiscal support, guarantees, and insurance act as buffers. This mirrors modern stress-testing designs that impose internally consistent paths for real activity, prices, rates, and labor markets.

### 3.3. Hypotheses

H1: Slower GDP growth compresses revenue and cash conversion, raising PD.

H2: Higher policy and market rates increase interest burdens and reduce collateral values, raising PD.

H3: Adverse price dynamics (cost-push inflation or weak PPI) and FX volatility squeeze margins and raise PD.

H4: Rising unemployment weakens consumption; B2C SMEs face sharper revenue drops and higher PD.

## 4. Macroeconomic Mechanisms Affecting SME Default Risk

### 4.1. Economic growth (GDP)

When growth is solid, demand is steadier, and receivables turn faster; many SMEs can service debt despite thin margins. When growth slows, top-line volatility rises, inventories accumulate, receivable days lengthen, and interest coverage shrinks—mechanically lifting PD. Global financial-stability monitoring in 2025 stresses that elevated uncertainty and uneven demand remain a background risk to corporate earnings, reinforcing this channel. IMF

Case evidence (pandemic shock). Two-wave phone surveys in China documented widespread temporary closures and steep sales declines among SMEs during lockdowns, with lingering effects on employment and survival probabilities—an extreme but illustrative example of a negative-growth shock propagating to default risk via cash-flow collapse [9].

### 4.2. Interest rates

Rate hikes pass through to banks' funding costs and loan pricing and, by lifting discount rates, compress collateral values (e.g., property, financial assets). Supervisory scenarios in Europe explicitly combine weaker GDP with higher unemployment and higher rates to map losses, reflecting the empirical link between tighter policy and higher PD among weaker credits. In China, 2025 monetary reports show lower average corporate loan rates and robust inclusive-SME lending, which partly offset the rate channel; firms exposed to offshore/market-linked borrowing, however, still face global "higher-for-longer" spillovers [10].

### 4.3. Prices: CPI and PPI (inflation/deflation mix)

Mild inflation can reduce the real burden of nominal debt, but cost-push inflation squeezes margins when input costs outpace pricing power. Conversely, a prolonged period of negative PPI signals weak upstream pricing power, compressing industrial profits and raising cash-flow risk. China's 2025 releases show soft CPI and episodes of negative PPI, consistent with margin pressure for producers and their SME suppliers; this combination elevates default risk even without high headline inflation.

### 4.4. Exchange rates

FX moves have asymmetric effects: RMB depreciation tends to help exporters (price competitiveness) while raising costs for import-intensive SMEs; appreciation does the reverse. Volatility itself suppresses investment and complicates pricing. Corporate hedging activity surged in 2025—firms sold a record number of USD/RMB options in H1—signaling active management of FX exposures and the materiality of this risk channel for SMEs with external linkages.

### 4.5. Labor market (unemployment)

Higher unemployment reduces household income and consumption, first hitting B2C SMEs such as restaurants, retail, and personal services. Pandemic-era micro evidence confirms that demand compression translated into arrears, exits, and job losses for small firms; in normal times, a milder version of the same mechanism applies, so unemployment is a core stress-test driver for SME books. Center For Global Development

### 4.6. Financial conditions and policy buffers

Beyond policy rates, broader financial conditions—risk appetite, credit spreads, collateral haircuts, and FX liquidity—shape roll-over risk. Global stability reports in 2025 warn that uncertainty and tighter conditions can amplify market-to-balance-sheet stress. IMF In China, inclusive-finance instruments, credit guarantees, and insurance are designed to share risk and keep credit flowing to viable SMEs; in 2024 the National Financing Guarantee Fund increased its risk-sharing ratio for innovative SMEs to as high as 40%, directly lowering lenders' loss severity on covered loans.

## 5. Empirical Research Design

### 5.1. Data sources

Macro Level (Quarterly Frequency): The data dimensions cover Gross Domestic Product (GDP) growth rate, Consumer Price Index (CPI), Producer Price Index (PPI), surveyed urban unemployment rate, policy rates and market rates, as well as the RMB exchange rate. The aforementioned core economic data are mainly sourced from official reports released by the National Bureau of Statistics (NBS) and the People's Bank of China (PBOC). When the analysis requires a global perspective, proxy indicators related to global financial conditions are referenced from the public data of the International Monetary Fund (IMF) and the Bank for International Settlements (BIS).

Micro Level: The data scope includes inclusive SME non-performing loan (NPL) ratios and overdue ratios disclosed by banks, firm-level Probability of Default (PD) and accounting risk indicators of small-cap listed companies, as well as industry-specific data provided by industry associations. To further enhance the robustness of the analysis, micro-databases formed by special surveys during the pandemic period are also incorporated, with relevant data referring to the research standards and statistical calibers of the Center for Global Development.

### 5.2. Methods

Estimate a province–industry quarterly panel with an SME default proxy as the dependent variable in the equation (1):

$$\begin{aligned} PDi,t = {} & \alpha + \beta 1GDPt + \beta 2Ratet + \beta 3PPI/CPIt + \beta 4FXt + \beta 5Unempt + \gamma Xi,t + \mu i + \tau t \\ & + \varepsilon i,t.PD_{i,t} \\ & = \alpha + \beta_1 GDP_t + \beta_2 Rate_t + \beta_3 PPI/CPI_t + \beta_4 FX_t + \beta_5 Unemp_t + \gamma X_{i,t} + \mu_i + \tau_t \\ & + \varepsilon_{i,t}.PDi,t \\ & = \alpha + \beta 1GDPt + \beta 2Ratet + \beta 3PPI/CPIt + \beta 4FXt + \beta 5Unempt + \gamma Xi,t + \mu i \\ & + \tau t + \varepsilon i,t \end{aligned} \tag{1}$$

We include entity and time fixed effects, allow for distributed lags, and test robustness by (i) swapping PD proxies (e.g., interest-coverage-below-1 share), (ii) estimating panel-VARs to trace impulse responses, and (iii) using policy events (e.g., LPR/structural-tool changes) in a difference-in-differences or local-projections framework. Stress overlays adopt the EBA 2025 macro-financial scenario to ensure coherence of GDP, unemployment, and rate paths.

## 6. Policy Recommendations

### 6.1. Government

(1) Deepen multi-tier capital markets and supply-chain finance so SMEs rely less on short-term bank debt: standardize receivables financing and expand asset-backed instruments anchored in trade data. (2) Coordinate counter-cyclical fiscal and monetary policy to stabilize expectations and avoid simultaneous weakness in growth, pricing power, and credit. (3) Build an integrated early-warning system that, with proper governance, uses tax e-invoices, social-security and utility data to flag cash-flow stress before defaults materialize; align this with macro-consistent stress scenarios used by supervisors.

### 6.2. Financial institutions

(1) Match products and tenors to cash cycles (separating working-capital turn loans from capex loans) and align amortization with revenue seasonality. (2) Upgrade underwriting with transaction data (orders, payments) while leveraging inclusive-finance infrastructure to widen access without weakening discipline; embed regular macro-scenario stress tests for SME portfolios. (3) Strengthen risk-sharing via policy guarantees and credit insurance so "first-loan/unsecured" can remain viable through the cycle; the higher guaranteed ratios for innovative SMEs are a useful model. (4) Offer simple FX-hedge toolkits for import-reliant SMEs given the demonstrated hedging demand in 2025.

### 6.3. Enterprises

(1) Tighten cash management via rolling 13-week forecasts and covenant dashboards; negotiate renewals well before maturities bunch. (2) Diversify funding (bank + supply-chain finance; where eligible, notes/ABS; quasi-equity for growth phases). (3) Actively hedge material FX/interest-rate exposures; in a weak-PPI environment, adjust product mix, pricing, and inventory to protect margins. (4) Document operations digitally (invoicing, energy-use trails) to reduce information frictions with lenders.

## 7. Conclusion

Findings. SME default risk rises when growth slows, interest rates increase, producer prices compress margins, unemployment weakens demand, and FX volatility raises uncertainty. The transmission is straightforward: macro shocks alter demand, costs, and financing conditions; these changes hit cash flow, collateral values, and coverage ratios; PD follows. Current supervisory scenarios and financial-stability assessments support these channels, and 2025 Chinese data on prices, unemployment, and loan pricing confirm their relevance. 国家统计局+3欧洲银行管理局+3IMF+3

Limitations. Micro default data for unlisted SMEs remain patchy; proxies (inclusive-loan NPLs, small-cap PDs) may not fully reflect the tail of micro firms. Endogeneity is a concern because policy relief often coincides with stress.

Future research. Incorporate real-time transaction data (e-invoices, electricity, logistics) into PD models; disentangle demand vs. cost vs. financing shocks using macro-consistent identification (e.g., sign-restricted VARs). Cross-country comparisons could reveal how institutional structures shift factor weights. IMF

## References


[1] Altman, E. I. (1968). "Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy." *Journal of Finance*. (Wiley). Wiley Online Library.

[2] European Banking Authority (2025). *Macro-financial scenario for the 2025 EU-wide banking sector stress test*. (PDF).

[3] IMF (April 2025). *Global Financial Stability Report: Enhancing Resilience amid* Uncertainty. IMF.

[4] National Bureau of Statistics of China (2025). *Latest Press Releases: CPI/PPI, Labor Market*.

[5] People's Bank of China (Q2 2025). *Monetary Policy Report*. (Webpage summary and PDF).

[6] Reuters (Aug. 7, 2025). "Chinese firms sell record amount of currency options in first half of 2025."

[7] Reuters (July 26, 2024). "China boosts financing support for smaller innovative tech companies" (National Financing Guarantee Fund increases risk-sharing to up to 40%). Reuters.

[8] State Council Information (2018). "The private sector… contributes over 50% of tax, 60% of GDP, 70% of innovation, 80% of urban employment; ~90% of firms."

[9] Dai, R., et al. (2020/2021). "The Impact of COVID-19 on SMEs: Evidence from Two-wave Phone Surveys in China." (CGD working paper; *China Economic Review* article).

[10] OECD (2025). *Financing SMEs and Entrepreneurs Scoreboard: 2025 Highlights*. (PDF). oecd.org.