
EARLY-WARNING RED FLAGS FOR MSME CREDIT RISK: A PLAYBOOK FOR LENDERS (NON-FRAUD FOCUS)

Adv. Khushboo Kejriwal, Advocate, PhD Scholar (Financial Management), Neville Wadia Institute of Management and Research, Affiliated to Savitribai Phule University of Pune.

Dr. Tanaji Chavan (Research Guide), Neville Wadia Institute of Management and Research, Affiliated to Savitribai Phule University of Pune.

ABSTRACT

India's Micro, Small, and Medium Enterprises (MSMEs) contribute 30% to GDP and employ over 110 million people, yet remain vulnerable to credit stress due to thin capital buffers and information asymmetry. This article presents a comprehensive framework for Early-Warning Systems (EWS) specifically designed for MSME credit risk management, distinct from RBI's fraud-focused Red-Flagged Accounts mechanism.

Drawing on international research and Indian regulatory requirements, we propose a five-dimensional red-flag matrix incorporating payment behaviour, compliance signals, operational metrics, banking patterns, and market intelligence. The framework integrates traditional financial ratios with real-time data from India's digital infrastructure—including GST e-invoicing, TReDS platforms, and Account Aggregator networks—to provide 3-6 months advance warning of potential defaults.

Through case studies and sector-specific analysis, the article demonstrates how timely EWS implementation can facilitate early intervention, preserve borrower relationships, and improve recovery outcomes. The proposed system aligns with RBI's 2002 Credit Risk Management Guidelines, 2014 Distressed Assets Framework, and 2024 Fraud Risk Management Direction while addressing data protection requirements under the Digital Personal Data Protection Act, 2023.

Key recommendations include establishing parallel workflows for credit deterioration versus fraud detection, leveraging India-specific data sources for enhanced predictive power, and implementing robust governance frameworks that balance risk identification with borrower fairness. The framework offers Indian lenders a practical, regulation-compliant approach to MSME credit monitoring that can strengthen financial stability while supporting continued credit flow to this critical economic sector.

Introduction

The resilience of India's financial system increasingly depends on effective risk management in the Micro, Small, and Medium Enterprise (MSME) sector. These enterprises, while contributing nearly 30% to the country's GDP and generating employment for over 110 million people, operate within a uniquely challenging risk environment characterised by limited financial transparency, concentrated customer relationships, and constrained access to alternative funding sources.

The COVID-19 pandemic starkly illustrated the sector's vulnerability, as revenue disruptions and liquidity constraints triggered widespread distress across MSME portfolios. International research consistently demonstrates that smaller firms experience more severe downturns and slower recoveries during economic shocks, primarily due to heightened information asymmetry and restricted credit access. In the Indian context, these inherent vulnerabilities are amplified by inconsistent financial reporting practices, irregular statutory compliance, and heavy dependence on a limited number of key buyers or suppliers.

Against this backdrop, traditional credit risk management approaches—typically reliant on periodic financial statements and retrospective analysis—prove insufficient for the dynamic risk profile of MSME lending. The time lag between actual deterioration and its reflection in formal financial reports often leaves lenders with inadequate lead time for effective intervention. By the time conventional warning signals appear, borrowers may already be beyond the point of successful restructuring or remedial support.

The imperative for more sophisticated, real-time risk detection mechanisms has never been clearer. Early-Warning Systems (EWS) that integrate traditional credit metrics with operational, compliance, and behavioural data offer the potential to identify emerging stress 3-6 months before conventional indicators would signal concern. Such systems can transform credit risk management from a reactive discipline into a proactive partnership between lenders and borrowers, preserving value for both parties while supporting the broader objective of maintaining credit flow to economically vital enterprises.

This article presents a comprehensive framework for implementing MSME-focused EWS within India's evolving regulatory and technological landscape, offering lenders practical tools to enhance risk detection while supporting sustainable growth in this critical economic sector.

Why this matters now

Micro, Small, and Medium Enterprises (MSMEs) form the foundation of India's economic architecture, contributing nearly 30% to GDP and almost half of the country's exports. They generate employment for over 110 million people,¹ yet most operate with thin working capital buffers, a concentrated customer base, and limited access to alternative finance.

The sector's fragility became evident during COVID-19, when revenue disruptions and liquidity shocks triggered widespread stress. International research confirms that smaller firms experience sharper sales drops and slower recoveries during downturns,² largely because they face stricter credit rationing and higher information asymmetry. In India, these risks are amplified by patchy financial disclosures, inconsistent statutory filings, and dependence on a few key buyers or suppliers.

MSMEs anchor jobs and supply chains yet operate with thinner buffers. International evidence shows small-firm opacity and informational frictions raise default risk, especially around shocks; Indian lenders therefore need practical, auditable early-warning systems (EWS) that surface deterioration early—well before a restructuring or NPA event. A well-designed Early-Warning System (EWS)—one that blends traditional credit metrics with real-time operational and compliance data—can give lenders a critical time advantage.

EWS versus RBI's 'Red-Flagged Accounts'

It is essential to separate the purpose of a credit-risk EWS from the RBI's Red-Flagged Accounts (RFA) mechanism. This article focuses on credit deterioration red flags. RBI's RFA regime, by contrast, addresses suspected fraud and mandates distinct governance and reporting.³ The RFA framework addresses suspected fraud—requiring banks to identify and report accounts showing early signs of fraudulent activity, such as diversion of funds or suspicious documentation.

A credit-risk EWS, by contrast, focuses on financial and operational deterioration that might eventually lead to default but does not imply fraud. Lenders should not conflate the two; a credit-risk EWS may trigger intensified monitoring or restructuring; an RFA has fraud-risk consequences. Confusing the two can result in unnecessary reputational harm for borrowers, incorrect escalation, and even legal disputes. For compliance clarity, every bank's credit

monitoring policy should maintain two parallel but distinct workflows: one for financial deterioration, another for fraud suspicion.

Regulatory footing (India)

The 2002 Guidelines on Credit Risk Management lay the foundation for risk identification and mitigation.⁴ The 2014 Framework for Revitalising Distressed Assets introduced Special Mention Accounts (SMA-0, SMA-1, SMA-2) as early stress categories.⁵ The 2015 EWS/RFA Circular mandated the integration of operational red flags into monitoring frameworks.⁶

EWS should be designed within RBI's Credit Risk Management Guidelines (2002), the 2014 Distressed Assets Framework (early recognition via SMA categories), the 2015 EWS/RFA circular, IRACP norms, and—where fraud risk indicators are implicated—the 2024 Master Direction on Fraud Risk Management.^{7 8}

Additionally, the Prudential Norms on Income Recognition, Asset Classification and Provisioning (IRACP) govern the classification and provisioning process, while the 2024 Master Direction on Fraud Risk Management provides updated guidance on fraud-related EWS indicators.

For MSME lending, these frameworks must be integrated with sector-specific realities, short reporting cycles, and the evolving digital compliance infrastructure in India (GST, MCA, TReDS, Account Aggregator).

Evidence: what predicts trouble early?

Classical models such as the Altman Z-score⁹ remain valuable but are limited by their reliance on audited financial statements, which may be outdated by the time they are filed. Classic ratio-based models (e.g., Altman Z) and parsimonious scorecards still do meaningful work when financials are sparse. But modern practice blends behavioural (transactional) and operational/compliance data, improving timeliness and lift.

For MSMEs, behavioural data—like declining daily balances, reduced invoice volumes, or delayed statutory payments—often signals distress months before financial ratios change. International studies^{10 11} show that changes in receivable cycles, supplier concentration, and inventory turnover are powerful predictors. Combining such operational metrics with

traditional ratios can improve the lead time for corrective action by three to six months.

Robust studies on SMEs underscore that macro shocks (e.g., COVID-19) can rapidly spike failure probabilities, and that credit tools must be periodically recalibrated.^{12 13}

An MSME Red-Flag Matrix (non-exhaustive)

1) Payment behaviour

- Persistent delinquencies (days-past-due rising across facilities).
- Bounced cheques, rising over-limit usage, or NSF patterns in operating accounts (via AA data with borrower consent).¹⁴
- Consistent overdue patterns across multiple facilities.
- Failed electronic payments and cheque bounces.

2) Compliance signals

- GST e-invoice volumes or GSTR-1 vs 3B gaps worsening over 1–2 quarters.
- Lapses in statutory filings (MCA), ESI/EPFO deposit irregularities.¹⁵
- Mismatch between GSTR-1 and GSTR-3B.
- Delays in MCA filings or irregular ESI/EPFO contributions.

3) Operations

- Receivable days lengthening (TReDS discounting increases; delayed acceptances).
- Supplier concentration spikes; abrupt inventory write-downs.¹⁶
- Sudden supplier concentration spikes.
- Inventory build-up without proportional sales.

4) Banking/treasury

- Declining average daily balance, rising volatility; frequent intraday limits breaches.
- High volatility in account turnover.
- Intraday limit breaches.

5) Legal/market intelligence

- Adverse media; IBC filings by creditors or major disputes; customer concentration loss.
- Sudden resignation of key management.
- IBC petitions or major litigation.

Case Study 1: Successful Early Intervention

A Pune-based auto components manufacturer supplying two major OEMs triggered three EWS alerts:

1. 15% drop in GST e-invoice volumes over three months.
2. Increased over-limit usage.
3. GSTR-1 and GSTR-3B mismatch.

On investigation, one OEM had diverted orders to another vendor. The lender provided temporary non-fund limit enhancements against collateral and facilitated TReDS onboarding. Within six months, the firm replaced lost orders with export contracts and avoided SMA-2/NPA classification.

Case Study 2: Missed Signals Leading to NPA

A logistics SME serving a large e-commerce client experienced delayed anchor payments and rising fuel costs. GST filings revealed growing arrears in statutory dues, but these were not part of the lender's monitoring. Without intervention, the firm defaulted within four months; recovery was impaired as core fleet assets had already been liquidated.

Sector-specific red flags

- **Manufacturing:** Raw material purchase spikes without matching orders; sharp drops in energy usage.
- **Services:** Shrinking average invoice values; attrition of top-billing employees.
- **Retail:** Slower inventory turnover; higher seasonal credit reliance.
- **Construction:** Delayed approvals; project site inactivity; cost overruns.

Global perspectives

- **UK:** British Business Bank integrates credit bureau and macro data for monthly SME risk grading.

- **Singapore:** MAS promotes integration of tax data with banking analytics under strict privacy safeguards.

- **US:** SBA uses fintech-linked payment data for real-time monitoring of guaranteed loans.

Global trends show multi-source integration and borrower engagement before adverse classification.

Legal consequences of poor EWS governance

Inadequate EWS can attract RBI scrutiny, penalties under the Banking Regulation Act, 1949, and poor supervisory ratings. Failure to classify an account as RFA in fraud-adjacent cases can trigger personal liability for bank officials under vigilance norms.

Integration with recovery and restructuring

Under the Prudential Framework for Resolution of Stressed Assets (2019), EWS detection triggers a 30-day review period. Red flags do not mean default; they require triage. A workable EWS should specify thresholds, a cool-off window, and human review before escalating to restructuring/forbearance or, in fraud-tinged cases, to RFA pathways. Timely intervention may enable borrowers to access schemes like CGTMSE or ECLGS, preserving value.

Technology partnerships

NBFCs often use fintechs for EWS development, integrating GST, MCA, and AA APIs. However, under RBI's Outsourcing of IT Services Directions (2023), the onus for data governance and compliance remains with the lender.

Analytics and explainability

Start with interpretable baselines (logit/scorecards) and only then layer machine learning where data permit. If you use random survival forests or gradient boosting, document variables, perform out-of-time tests, monitor population stability, and recalibrate at defined intervals.¹⁷

Data protection and fairness

Use consent-based access for personal data, ensure purpose limitation and data minimisation

as per the Digital Personal Data Protection Act, 2023, and align adverse-action notices with explainability. Model governance should meet proportionality under Puttaswamy.^{18 19}

India-specific data taps worth enabling now

- GST: monitor e-invoice coverage (₹5 crore threshold from 01-08-2023) and reconciliations.
- TReDS: track invoice-discounting volume/frequency.
- AA: use consent-based operating-account analytics for cash-flow flags.

Future outlook

With e-invoicing, Account Aggregator, and real-time compliance data maturing, MSME EWS will become richer and more predictive. However, privacy compliance under the DPDP Act, 2023 and proportionality under Puttaswamy will remain central to design.

Governance checklist

(1) Policy distinguishing credit-deterioration vs fraud flags; (2) Documented indicators and thresholds; (3) Validation tests; (4) Monitoring; (5) Escalation; (6) Customer fairness; (7) Records for audit.

A comprehensive governance framework should include:

1. Written EWS policy.
2. Indicator list and thresholds.
3. Escalation procedures.
4. Validation and back-testing.
5. Fraud v/s deterioration separation.
6. Borrower communication protocols.
7. Comprehensive audit trails.

Bottom line

Thoughtful EWS improves speed, fairness and recoveries—keeping credit flowing to MSMEs through cycles. EWS is not about predicting every failure—it's about giving lenders the time to act, borrowers the chance to recover, and the financial system the resilience to withstand shocks.

References

- 1 OECD, *Financing SMEs and Entrepreneurs 2020: An OECD Scoreboard* (OECD 2020).
- 2 NBER, Pierre-Olivier Gourinchas and others, 'COVID-19 and SME Failures' (NBER Working Paper No 27877, 2020).
- 3 RBI, 'Frauds—Classification and Reporting by Commercial Banks and Select FIs: Early Warning Signals (EWS) and Red Flagged Accounts (RFA)' (Circular, 2015).
- 4 RBI, 'Guidelines on Credit Risk Management by Banks' (October 2002).
- 5 RBI, 'Framework for Revitalising Distressed Assets in the Economy' (2014).
- 6 RBI, 'Frauds—Classification and Reporting by Commercial Banks and Select FIs: Early Warning Signals (EWS) and Red Flagged Accounts (RFA)' (Circular, 2015).
- 7 RBI, Master Circular—Prudential Norms on Income Recognition, Asset Classification and Provisioning (IRACP) (latest).
- 8 RBI, Master Direction — Fraud Risk Management Framework for Banks (2024).
- 9 Altman EI, 'Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy' (1968) 23 *Journal of Finance* 589.
- 10 Ciampi F and Gordini N, 'Small Enterprise Default Prediction Modeling through a Fuzzy Logic Approach' (2013) 51 *Journal of Small Business Management* 16.
- 11 Hyytinen A and Pajarinen M, 'Opacity of Young Businesses: Evidence from Rating Disagreements' (2008) 32 *Journal of Banking & Finance* 1234.
- 12 Altman EI, Esentato M and Sabato G, 'Assessing the Credit Risk of Italian SMEs and Mini-Bond Issuers' (2020) 44 *Global Finance Journal* 100639.
- 13 Fantazzini D and Figini S, 'Random Survival Forest Models for SME Default Prediction' (2009) arXiv:0903.4156.
- 14 Luo T and others, 'Default Risk Prediction of SMEs Based on Public Credit Information'

(2020) 12(18) Sustainability 7575.

15 GST Council, Notification No 10/2023—Central Tax (10 May 2023).

16 RBI, 'Trade Receivables Discounting System (TReDS)'—framework and participants.

17 Cheraghali R and Molnár P, 'Rethinking SME Default Prediction: A Systematic Literature Review' (2023) *Scientometrics* (forthcoming).

18 Digital Personal Data Protection Act 2023, No 22 of 2023 (GoI Gazette).

19 Justice K. S. Puttaswamy (Retd.) v Union of India (2017) 10 SCC 1.