

WHITEPAPER

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ABOUT

In an era where rapid market shifts and regulatory demands redefine risk management, early warning systems (EWS) empower banks to transition from reactive to proactive strategies by detecting emerging risks before they impact profitability or compliance. By integrating diverse signals, an effective EWS helps leadership safeguard financial stability, align with regulations, and uncover opportunities for growth and resilience.

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The proactive bank: Building operational resiliency with a modern early warning framework

In today's banking landscape, speed and foresight are the new currency of risk management. The traditional "rear-view mirror" approach, which depends on analyzing events after they occur, can't keep up with an environment where market conditions and reputational damage can shift within hours. By continuously scanning signals from borrower behavior, market sentiment, cyber threats, and external disruptions, a modern early warning system (EWS) empowers banks to spot trouble before it impacts their P&L. Regulators have made early risk identification a non-negotiable requirement, demanding that banks not only detect emerging risks but also prove that their insights drive real action and measurable results.

The true power of "early" lies in calibrated triggers and thresholds that strike the right balance between sensitivity and stability, supporting accurate provisioning and regulatory compliance under IFRS 9. It's essential to consider how an EWS integrates with existing frameworks such as watchlists (i.e., WWM), portfolio monitoring and impairment staging. When designed effectively, an EWS shifts risk management from a reactive task to a strategic advantage, empowering banks to act before risks materialize, safeguard profitability, and strengthen stakeholder trust.

The best EWS frameworks blend proprietary financial and behavioral data, market indicators such as CDS spreads and equity volatility, and alternative sources — news sentiment, cyber risk, ESG factors — and supply chain dependencies. These diverse signals are aggregated into intuitive risk tiers, empowering risk managers to prioritize and act decisively.

Governance is built in, with clear escalation paths and audit trails ensuring that alerts trigger timely intervention across all lines of defense. When embedded effectively, EWS delivers strategic value to every leadership function—from predictive oversight for the CRO, to portfolio protection for credit officers,

to earnings stability for the CFO, and institutional resilience for the CEO and board.

Beyond being a powerful tool for credit risk prevention, a modern EWS also provides the framework and ingredients for detecting fraud risks and identifying growth opportunities, which further enhances its strategic utility across the enterprise. For fraud, early signals from behavioral anomalies, cyber risk indicators, and transactional patterns can help flag potential misconduct before it escalates. For growth, market sentiment, ESG trends, and supply chain dynamics, among others, can reveal emerging opportunities for strategic expansion or investment.

INTRODUCTION: THE NEW VELOCITY OF RISK

In banking, timing is everything. The difference between a manageable exposure and a major loss often comes down to how early a signal of distress is detected—and how quickly a bank can respond.

That's the role of an EWS. At its core, an EWS is a structured framework designed to identify early signs of potential credit or operational deterioration before it becomes visible in traditional financial metrics or statements. By continuously monitoring a range of indicators – from borrower behavior and financial health to external signals such as market sentiment, cyber risk, or supply chain disruption – an EWS provides a clear, forward-looking view of emerging vulnerabilities.

When designed effectively, an EWS promotes proactive intervention. Relationship managers/ Credit officers can engage customers earlier, risk managers can adjust exposures before losses occur, and executives can make better informed decisions. In short, it allows the organization to shift from reactive to preventive risk management – protecting both profitability and reputation. There's also a strategic advantage in being a first mover: if a customer goes into default without clear prior signals, an effective EWS can still help banks act faster than their peers in initiating workout strategies, allowing them to limit potential losses.

This capability has never been more critical. The pace and interconnectedness of modern risks have made the traditional “rear-view” approach to risk management obsolete.

Banks can no longer rely on hindsight; the ability to peer around corners and perform forward-looking analysis and stress testing provides them a distinct edge. Today, a social media rumor can trigger a deposit run within hours. A ransomware attack can halt payment infrastructure for weeks. A geopolitical event can instantly disrupt entire industries overnight.

In today's environment, foresight is the key to resilience. The institutions that can detect faint signals and act decisively before risks materialize will be the ones that stay ahead. An EWS Framework provides the structure, analytics, and governance to make foresight possible – and turn risk management into a source of competitive advantage.

¹SSM Supervisory Priorities 2025-2027

²ECB Guidance to Banks on Non-Performing Loans, Section 3.6

³EBA GL 2020 06 Final Report on GL on loan origination and monitoring, Section 8.5

THE REGULATORY MANDATE

Supervisors have taken notice of this new reality. The European Central Bank (ECB) has established that a top supervisory priority for 2025-2027 is strengthening banks' ability to withstand immediate shocks by making sure they can "identify deteriorations in asset quality in a timely manner"¹ – a clear signal that the industry must evolve. The shift toward proactive risk identification is no longer just a best practice; it's rapidly becoming a regulatory imperative.

The **ECB's Guidance on Non-Performing Loans** is explicit: "All banks should implement adequate internal procedures and reporting to identify and manage potential non-performing clients at a very early stage"². This requirement applies across both individual borrower and portfolio levels – reinforcing that early identification must be systematic, not ad hoc.

The **EBA Guidelines on Loan Origination and Monitoring** further cement this expectation. Institutions are required to "develop, maintain and regularly evaluate relevant quantitative and qualitative EWIs [Early Warning Indicators] that are supported by an appropriate IT and data infrastructure that would allow the timely detection of increased credit risk." The EBA further expects these indicators to have "defined trigger levels" and "assigned escalation procedures" to ensure signals lead to action³.

The message for banking executives is clear: compliance is no longer an *if*, but *how effectively* your institution can demonstrate that it identifies and mitigates risk early. Regulators expect that EWS frameworks not only detect emerging credit deterioration but also provide transparent, auditable evidence of how those insights translate into management decisions and measurable outcomes.

ANATOMY OF A MODERN EARLY WARNING FRAMEWORK

A best-in-class EWS goes far beyond tracking days past due. It's an intelligent, connected ecosystem built on three pillars— diverse data signals, smart aggregation, and ongoing monitoring— that together deliver forward-looking risk visibility.

Best-in-class Early Warning framework

SMART DATA, SMARTER DECISIONS

EWS integrates a bank's internal data with a vast array of external and alternative data sources, leveraging AI and automation and advanced analytics to project risk

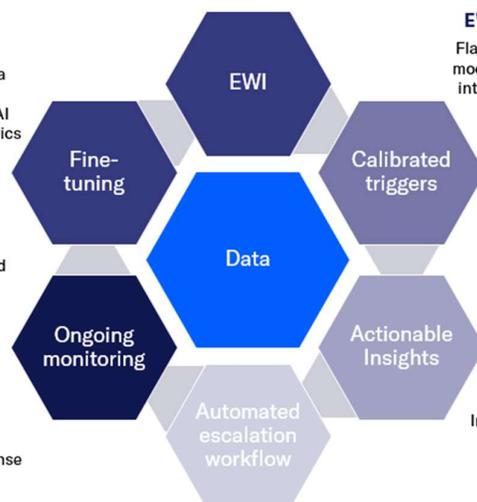
ONGOING MONITORING AND FINE-TUNING

Structured recurrent reviews, back-testing of predictive performance, and periodic re-calibration so that the EWS remains effective and adapts to changing market conditions and evolving risks

ESCALATION WORKFLOW

Establish clear escalation paths and audit trails for timely intervention across the bank's three lines of defense

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EWI SCORING & AGGREGATION

Flag-based scoring systems or weighted models consolidate complex information into intuitive risk tiers – often visualized as a "traffic light" system

CALIBRATION

EWS is calibrated to achieve an optimal balance between the sensitivity of early detection and the avoidance of excessive "false positives"

ACTION PLAN

In the case of breaches, a clear trigger followed by a defined escalation process should be activated

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²ECB Guidance to Banks on Non-Performing Loans, Section 3.6

³EBA GL 2020 06 Final Report on GL on loan origination and monitoring, Section 8.5

Part 1: The “what:” A comprehensive set of early warning indicators (EWIs)

Modern risk can't be understood through a single lens. A holistic EWS blends multiple, often uncorrelated, data sources to surface early indicators of potential credit deterioration that might otherwise go unnoticed.

- **Bank's data:** The foundation remains a bank's own proprietary data— borrower financials (e.g. trends and macroeconomic stressed financial projections), payment and utilization performance, loan-to-value (LTV) levels, covenant adherence, and internal rating migrations.
- **Market-based data:** Forward-looking point-in-time probability of default (PD) models, credit default swap spreads (CDS), and equity volatility provide real-time insights into market sentiment and perceived creditworthiness.
- **External and alternative data:** The true differentiator of a modern EWS lies in its ability to incorporate dynamic, real-world data, such as:
 - **Adverse media and news sentiment:** Artificial intelligence (AI)-powered analytics across thousands of global news sources can flag signs of distress—defaults, layoffs, fraud, or legal disputes—months before traditional metrics reflect trouble.
 - **Cyber risk indicators:** A company's digital resilience is now core to its operational and credit profile. As one major US incident showed, a successful ransomware attack can cost a firm billions and disrupt its ability to operate, directly impacting its capacity to service debt.
 - **ESG and climate factors:** Environmental, social, and governance performance has become a leading predictor of long-term resilience and credit stability.
 - **Supply chain and geopolitical dependencies:** Mapping exposures to regions, suppliers, and trade routes helps anticipate disruptions or concentration risks before they materialize.

Part 2: The “how:” From data to decision

Aggregation and scoring: A modern EWS transforms dozens of data points into clear, actionable insights. —Flag-based scoring systems or weighted models consolidate complex information into intuitive risk tiers – often visualized as a “traffic light” system which provides an at-a-glance assessment, allowing risk managers to prioritize their attention effectively. Effectiveness depends on fine-tuned triggers. By combining historical portfolio data with expert judgment, banks can tune sensitivity to balance early detection with manageable “false positives.”

Governance and workflow: Insights are valuable only when they lead to a timely action. An effective EWS embeds accountability across the bank's three lines of defense:

- **First line – Business ownership:** Relationship managers and credit teams act on alerts and engage customers proactively.
- **Second line – Risk oversight:** The risk function defines the methodology, monitors system integrity, and provides an independent challenge.

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²ECB Guidance to Banks on Non-Performing Loans, Section 3.6

³EBA GL 2020 06 Final Report on GL on loan origination and monitoring, Section 8.5

→ **Third line – Audit and assurance:** Internal audit enforces adherence to policy and validates that the framework operates as designed. Automated escalation paths, role-based ownership, and comprehensive audit trails guarantee that alerts trigger response – not just awareness.

Ongoing monitoring: EWS must evolve alongside the market. Ongoing governance includes structured annual reviews, regular back-testing of predictive performance, and periodic recalibration so that the EWS remains effective and adapts to changing market conditions and evolving risks.

THE TRUE MEANING OF “EARLY”: CALIBRATION, THRESHOLDS, AND PROVISIONING IMPACT

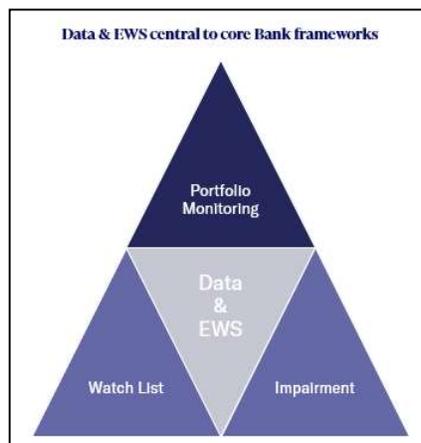
An effective EWS must detect deterioration as soon as credible signals appear, well before delinquency or default are visible in financial statements. This requires more than just robust data; it demands carefully calibrated triggers that align with the bank’s defined risk appetite and tolerance for false alarms.

If thresholds are set too tightly, the bank will face an influx of false positives, creating operational inefficiencies and alert fatigue. If they’re set too loosely, emerging risks may be missed, leading to delayed intervention and higher non-performing loan (NPL) levels. The key is finding the balance – making sure the system is both sensitive and stable.

To measure effectiveness, institutions should not only report the static risk level of a portfolio at a given time but also track its movement – monthly migration between arrears stages and the performance of key early warning indicators (EWIs) over time. These analytics provide insight into whether the system is truly capturing deterioration early enough to make a difference.

This calibration isn’t just an operational concern; it directly influences the accuracy and timeliness of provisioning. Under IFRS 9, assets migrate from Stage 1 (performing) to Stage 2 (underperforming) when a significant increase in credit risk is detected – before any actual delinquency. Because that transition triggers lifetime expected credit losses, an effective EWS is critical to make sure those movements are justified, consistent, and defensible.

Supervisory authorities including the Basel Committee on Banking Supervision (BCBS) and the European Banking Authority (EBA) have emphasized that credit risk typically begins to deteriorate months or even years before default events become observable. Accordingly, an optimal EWS should segment obligors into risk categories such as Pre-Watchlist/Performing, Watchlist, and Problem Asset and Default, allowing the bank to act early and proportionately.



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Ultimately, the “early” in EWS refers not just to timing – but to foresight. A well-calibrated EWS underpins accurate provisioning, stable capital ratios, and sustained investor confidence. It makes sure the bank’s response to risk is measured, proactive, and fully aligned with both prudential expectations and its own appetite for risk.

THE EWS IN ACTION: CREATING STRATEGIC VALUE ACROSS THE BUSINESS

A modern EWS isn’t a back-office compliance exercise — it’s the central nervous system of a resilient, future-ready bank. When effectively embedded, it delivers measurable value across every leadership function.

- **Chief Credit or Lending Officers (CCO/CLO):** Protects and enhances portfolio quality by surfacing early signs of borrower distress. Early dialogue and targeted remediation prevent losses while supporting constructive customer engagement.
- **Chief Risk Officer (CRO):** Gains predictive oversight, shifting from retrospective reporting to proactive risk intelligence. This allows for more strategic allocation of capital and resources toward emerging threats and opportunities.
- **Chief Financial Officer (CFO):** Reduces earnings volatility through more stable provisioning, thanks to earlier visibility into potential credit deterioration.
- **CEO and Board:** Demonstrates institutional resilience and sound governance to regulators, investors, and markets – reinforcing confidence in the bank’s long-term stability.

When leveraged effectively, the EWS becomes more than a monitoring tool. It establishes a framework for proactively identifying credit and fraud risks and uncovering new avenues for growth, positioning the organization for sustained success. It becomes a strategic advantage allowing faster decision-making, more consistent performance, and stronger stakeholder trust.

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