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Early warning systems for financial distress: International developments

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Abstract

Objective. This editorial examines the evolution and effects of mandatory early warning systems for financial distress, focusing on the European Directive (EU) 2019/1023 and its Italian transposition (Legislative Decree No. 14/2019). It seeks to understand how this preventive model reshapes corporate governance, expanding managerial responsibility and promoting practices for the early detection of financial imbalances.
Method. The study adopts a qualitative and comparative approach, analyzing the conceptual and operational foundations of the European regulatory framework and contrasting them with the Brazilian legal environment, where preventive mechanisms remain voluntary. The discussion integrates regulatory references, academic literature, and international practices in governance and risk management.
Results. The analysis shows that mandatory early warning systems strengthen organizational resilience, structure internal processes for continuous monitoring, and reduce the likelihood of insolvency, particularly for small and medium-sized enterprises (SMEs). In Brazil, the absence of mandatory requirements maintains a reactive system, limiting organizations' preventive capabilities.
Contributions. The editorial broadens the debate on governance-based crisis prevention, offering practical implications for SMEs and for accounting and consulting professionals, as well as identifying research avenues related to organizational culture, financial performance, and the effects of voluntary adoption of such systems.
Keywords: Early Warning Systems. Financial Distress. Corporate Governance. Insolvency Prevention. Small and Medium-Sized Enterprises (SMEs).

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1 Introduction

Corporate financial distress represents a major threat to economic stability and business continuity, particularly for small and medium-sized enterprises (SMEs), which often lack the resources and managerial capacity to anticipate and respond to crises effectively. In recent years, the European Union has sought to address this challenge through the Restructuring and Second Chance Directive (EU) 2019/1023, which introduced mandatory early warning systems for financial distress. This regulatory innovation marks a paradigmatic shift from reactive to preventive approaches to insolvency, embedding the principles of timely detection and proactive management within firms' governance structures. The Italian transposition of the Directive, through Legislative Decree No. 14/2019, has further operationalized these concepts by requiring firms to maintain "adequate organizational, administrative, and accounting structures" capable of identifying early signs of crisis and supporting timely remedial action.

From an international perspective, this development offers valuable insights for non-EU jurisdictions such as Brazil, where preventive governance mechanisms remain largely voluntary. The contrast between the mandatory European model and the voluntary Brazilian framework highlights not only regulatory divergence but also distinct conceptions of managerial responsibility and corporate governance. By comparing these institutional settings, this editorial aims to illuminate the research and practical implications of early warning systems for financial distress. It underscores how preventive regulation can potentially foster managerial accountability, enhance organizational resilience, and promote the sustainable management of enterprises, especially within the SME sector.

2 Mandatory early warning of financial distress: EU and Italian perspectives

Insolvency frameworks establish the legal procedures for addressing the situation of insolvent debtors. Although the definition of insolvency is not uniform across the European Union, it generally refers to debtors whose financial position prevents them from meeting their obligations either in the short term—when they are unable to pay debts as they fall due—or in the medium term - when their assets do not cover their liabilities - or both (IMF, 2022). Insolvency legislation typically defines the conditions under which insolvency proceedings can be initiated, outlining the rights and obligations of creditors and debtors, the role of courts, and the procedural steps and timelines to be followed once proceedings commence. Such frameworks may also include mechanisms for the early restructuring of private sector debt, either within formal insolvency procedures or prior to the declaration of insolvency.

On 20 June 2019, the European Union adopted the *Restructuring and Second Chance Directive* (Directive (EU) 2019/1023), which significantly innovated European insolvency law. The origins of the Directive can be traced back to Commission Recommendation 2014/135/EU, which encouraged Member States to establish frameworks enabling (i) the efficient and early-stage restructuring of viable enterprises in financial difficulty, in order to prevent insolvency, and (ii) a "second chance" for honest entrepreneurs, thereby promoting entrepreneurship, investment, and employment, and contributing to the smooth functioning of the internal market.

Building on this Recommendation, the Directive introduces rules designed to facilitate restructuring, provide honest but insolvent or over-indebted entrepreneurs with a second chance, and enhance the efficiency of restructuring, insolvency, and debt discharge procedures. In particular, it promotes the introduction of effective preventive restructuring mechanisms for viable enterprises in financial difficulty. These mechanisms aim at delivering multiple benefits: enabling debtors to restructure at an early stage and avoid insolvency, thus limiting the unnecessary liquidation of viable firms; helping preserve employment, know-how, and economic value for creditors, owners, and society; and allowing for proactive intervention before enterprises default on their loans, thereby reducing the risk of non-performing loans during cyclical downturns and mitigating adverse effects on the financial system.

The main characteristics of the early warning system for financial distress

One of the most significant innovations introduced by Directive (EU) 2019/1023 is the requirement to establish an early warning system for financial distress—the underlying idea being that the earlier a debtor detects financial difficulties and takes appropriate action, the greater the likelihood of avoiding imminent insolvency. The Directive marks a transition from a system of rules designed to intervene only once a business situation has already deteriorated beyond recovery – that is, when insolvency has already occurred – to a mechanism aimed at detecting financial imbalances at an early stage. This new approach emphasizes prevention rather than reaction, seeking to identify the initial symptoms of distress within the enterprise before they escalate into insolvency.

In Italy, such an early warning system has been defined by the national legislator as "adequate organizational, administrative and accounting structures for the timely detection and management of financial crises" (Code of Business Crisis and Insolvency – Legislative Decree No. 14/2019).

According to academic and professional best practices, "organizational arrangements" encompass the overall structure of the enterprise, including its organizational chart, allocation of roles and responsibilities, decision-making processes, and systems for planning, control, communication, and risk management. They also reflect the leadership style and human resource management practices that shape the firm's governance culture.

"Administrative arrangements" ensure that decision-making processes—both strategic and operational—are conducted according to sound principles of planning, programming, and control. Key instruments include the business plan, budgeting processes, and regular performance reporting, which together form the backbone of effective managerial oversight.

"Accounting arrangements" relate to the systems for recording and representing business transactions, aimed at providing a true and fair view of the enterprise's financial, economic, and equity position.

In a nutshell, organizational, administrative and accounting structures can be considered adequate when they allow firms to manage risks effectively. The concept of risk includes, but it is not limited to, the risk of financial crisis or bankruptcy. Therefore, organizational, administrative and accounting structures are risk-based in nature and conceptually aligned with the Enterprise Risk Management (ERM) model outlined by the *Committee of Sponsoring Organizations of the Treadway Commission* (COSO ERM). By embedding crisis detection and response mechanisms within an integrated internal control system, enterprises can enhance their capacity to prevent and mitigate business and insolvency risks, thereby strengthening long-term resilience and sustainability.

Organizational, administrative, and accounting structures are designed to enable firms to promptly detect corporate financial crises.

From this perspective, indicators of crisis include imbalances of a patrimonial, economic, or financial nature—evaluated in light of the specific features of the enterprise and its business activity—as well as signs of unsustainable indebtedness. The set of indicators necessary for sound and prudent business management and for the early detection of crisis should therefore be *predictive* rather than merely descriptive. They should comprise not only monetary indicators but also technical measures (such as efficiency, productivity, and quality ratios) and analytical indicators derived from management control systems that monitor profitability across significant business segments (products, markets, or clients). Synthetic indicators should also be forward-looking, reflecting the company's trends rather than its past performance.

Organizational, administrative, and accounting structures are also designed to enable firms to act promptly once crisis has been detected.

From this perspective, early detection of financial distress is not an end in itself but rather the precondition for timely and effective remedial action. Recognizing the signs of crisis—its causes, scope, and severity—is essential, yet insufficient unless the entrepreneur acts promptly and decisively to address it.

Therefore, the three dimensions of organizational, administrative and accounting structure are mutually interdependent. For instance, without a clearly defined organizational structure, it becomes difficult to establish coherent procedures or to assign responsibilities for monitoring and control. Effective crisis prevention therefore requires a holistic framework that integrates all areas and processes of the enterprise, involving every corporate body and functional unit in the design and maintenance of an adequate governance model.

The Mandatory Nature of the Early Warning System for Financial Distress

The key element of innovation of the Directive (EU) 2019/1023 (and its transposition in the Italian context) concerns its normative character. The obligation to establish adequate organizational, administrative, and accounting structures for the timely detection and management of financial crises is no longer merely a matter of good business practice—it has become a legal duty, thereby imposing a specific responsibility on the firm's governing body (the board of directors or legal representative). In other words, to act diligently, the governing body must implement appropriate organizational, administrative, and accounting structures, the adequacy of which must be assessed in light of the nature and size of the business. Until recently, the entrepreneur–debtor was not subject to such a specific obligation.

In addition to adopting suitable organizational, administrative, and accounting arrangements capable of promptly detecting a state of crisis, the governing body is also required to act without delay to adopt and implement the necessary measures to address the crisis once it has been identified.

Accordingly, alongside the duty to detect early signs of distress, the entrepreneur bears a specific legal obligation to adopt, without undue delay, the necessary measures to restore equilibrium and safeguard business continuity. In line with the *business judgment rule*, it is the entrepreneur's responsibility to select the most appropriate path among the various restructuring and crisis-resolution tools provided by law—first and foremost, to assess the conditions for initiating the "negotiated settlement of the crisis", or alternatively pursuing other routes such as shareholder financing or extraordinary corporate operations.

Failure to comply with these obligations constitutes an independent source of liability, irrespective of whether additional misconduct is established. For example, directors of a bankrupt company may be held liable to creditors if they failed to establish an early warning system (i.e., adequate organizational, administrative, and accounting structures) and it can be demonstrated that, had such a system been in place, the company could have been rescued. They may likewise be held liable for failing to act promptly to overcome the crisis, once it was detected.

A comparison with the Brazilian legal and institutional framework highlights a significant divergence regarding the *mandatory nature* of early warning systems for financial distress. In Brazil, there is no explicit legal obligation requiring companies to establish preventive mechanisms equivalent to the *organizational, administrative, and accounting structures* mandated by Directive (EU) 2019/1023 and the Italian *Codice della Crisi d'Impresa e dell'Insolvenza* (Legislative Decree no. 14/2019). The Brazilian *Law No. 11.101, of 9 February 2005* (Bankruptcy and Corporate Recovery Law), as amended by *Law No. 14.112, of 24 December 2020*, focuses primarily on procedures for judicial or extrajudicial reorganization and bankruptcy, rather than on the early detection or prevention of insolvency.

While the 2020 reform sought to modernize the insolvency system by incorporating instruments for negotiation and pre-insolvency restructuring, such as *mediação pré-processual*, it did not introduce a statutory obligation for firms to maintain early warning or risk-monitoring systems. Preventive financial governance in Brazil therefore relies largely on voluntary corporate governance mechanisms, such as those promoted by the Instituto Brasileiro de Governança Corporativa (IBGC) and by regulatory agencies (CVM, Bacen, SUSEP), as well as on internal control and risk management structures inspired by frameworks such as COSO ERM.

Consequently, whereas in the European and Italian contexts the failure to implement an early warning system may constitute legal liability for directors, in Brazil such mechanisms are treated as best practice rather than legal duty. The adoption of internal controls, compliance programs, and early warning indicators, although aligned with the principles of sound management and sustainability, is not enforceable under corporate or insolvency law. This distinction underscores a normative gap: the Brazilian framework remains reactive, intervening mainly after the manifestation of financial distress, while the European model is explicitly preventive, aiming to detect and mitigate risks before insolvency becomes inevitable.

In summary, the European Directive and its Italian transposition introduce a mandatory and enforceable governance responsibility for early crisis detection, linking managerial diligence to legal accountability. By contrast, in Brazil, the preservation of business continuity depends on the managerial discretion of directors and on the degree of institutional maturity of corporate governance practices, rather than on a statutory preventive framework.

3 Research implications

3.1 Current research on corporate financial crises

Current research on corporate financial crises encompasses multiple perspectives. Nevertheless, providing an exhaustive review of the extant literature lies beyond the scope of this study. It is, however, essential to briefly revisit certain themes that have been explored in prior research in order to contextualize and justify the novel research avenues that may emerge from the EU case discussed in the preceding section.

One major stream of literature investigates the determinants of financial distress. As articulated by Habib et al. (2020), these determinants can be broadly classified into three categories: (i) firm-level fundamental factors, such as R&D investment, corporate hedging policies, employee relations, management narrative disclosures, corporate social responsibility (CSR) practices, and qualified audit opinions; (ii) macroeconomic factors; and (iii) corporate governance–related factors, such as board structure, CEO characteristics, and ownership configuration.

A second body of research focuses on the prediction and measurement of financial distress. The overarching aim of this literature is to design reliable early warning systems for corporate financial crises, albeit from a perspective distinct from that advanced in the present study. Early empirical work in this domain relied heavily on accounting-based indicators, as evidenced in the seminal contributions of Beaver (1966) and Altman (1968), both of whom employed financial statement data to develop distress prediction scores. To address the limitations inherent in accounting-based approaches—most notably their static nature and backward-looking bias—subsequent research introduced market value–based prediction models. These models conceptualize equity as a European call option on the value of a firm's assets, with core variables including asset value, asset volatility, debt face value, the risk-free rate, and the equity risk premium.

Despite the evolution of modeling techniques, most empirical studies continue to rely on accounting-based measures such as Altman's (1968) Z-score, Ohlson's (1980) O-score, and Zmijewski's (1984) model. Mainstream accounting and finance research still attributes substantial predictive value to financial statements, notwithstanding their well-documented limitations – namely, the reliance on historical cost accounting, the omission of intangible assets such as R&D, the inability to capture expected volatility, and their inherently limited informational scope. More recent contributions have sought to enhance predictive accuracy through the application of textual analysis of management disclosures (Zhang et al., 2023) and artificial intelligence (AI) methodologies (Wang, 2022).

A third, and increasingly significant, research domain concerns corporate turnaround strategies in response to financial distress. The extant literature identifies three principal approaches.

The first is managerial restructuring, often regarded as a precondition for effective corporate recovery. Incumbent executives frequently face cognitive and behavioral barriers to implementing radical change. Consequently, the replacement of top management is interpreted by banks, investors, and other stakeholders as a credible signal of strategic renewal and organizational commitment to improvement. Empirical evidence suggests that firms achieving recovery exhibit a higher incidence of managerial turnover than their non-recovering counterparts. Nevertheless, capital market reactions to such changes remain mixed—ranging from positive to negative or neutral—rendering the overall efficacy of managerial restructuring inconclusive.

The second approach involves operational and asset (strategic) restructuring. The initial operational stage seeks to stabilize the firm by implementing cost-reduction initiatives, enhancing revenues, and optimizing asset utilization to improve efficiency and cash flow. These measures are inherently short-term and critical to avoiding insolvency. Typical actions include workforce downsizing, cost containment, and the disposal of non-core assets. However, sustainable recovery generally necessitates progression to a second, strategic stage, characterized by long-term initiatives such as product or market refocusing, diversification, and acquisitions. While operational measures have been empirically associated with successful turnarounds, they appear to be a necessary but not sufficient condition for enduring recovery.

The third approach, financial restructuring, entails the reconfiguration of a firm's capital structure through equity-based and debt-based instruments. Equity-based measures include dividend reductions or omissions and new share issues, while debt-based measures encompass debt rescheduling, interest rate concessions, and debt–equity swaps. Firms in financial distress frequently curtail dividend payments and raise equity to mitigate liquidity constraints and restore creditor confidence. Although debt restructuring has historically been less prevalent in the UK, it represents a potentially critical mechanism for mitigating or resolving financial distress. The empirical assessment of its effectiveness in corporate turnarounds, however, remains an open question.

3.2 Research developments on early warning systems for financial distress

The topic of mandatory early warning systems for financial distress opens several promising avenues for future research.

Previous literature (Jin et al., 2024) has discussed the concepts of *crisis preparedness*—which involves specific skills, knowledge, and abilities—and *crisis readiness*, understood as an organizational mindset oriented towards actively confronting crises. A recurring theme in the literature is that organizational culture and beliefs play a crucial role in shaping responses to crises, serving as a defensive mechanism for organizations that are primed to manage crises effectively (Ghaderi et al., 2021). Consequently, integrating a responsive and adaptable culture within the management development process has been deemed essential (Elsubbaugh et al., 2004; Evans & Elphick, 2005). Future research could therefore investigate whether the mandatory introduction of early warning systems under the EU Directive has helped European companies to develop and embed corporate cultures that foster the prevention and detection of crises. From an empirical perspective, researchers could exploit the implementation of the EU Directive as a semi-natural experiment to assess its effects on firms' internal governance and cultural adaptation. Further studies might also examine how specific features of early warning systems—such as their scope, technological sophistication, or degree of managerial involvement—affect corporate culture, regardless of whether their implementation is mandatory or voluntary. For instance, one possible line of inquiry could explore whether firms with more data-driven or participatory early warning systems exhibit stronger proactive crisis management behaviors.

Previous studies have long recognized the importance of early warning systems. The timely recognition of early signs of crisis can significantly reduce the impact on an organization and facilitate a more accurate assessment of potential repercussions (Ghaderi et al., 2021; Vašičková, 2020). Moreover, effective early signal detection has the potential not only to mitigate but, in some instances, to prevent the occurrence of crises altogether (Elsubbaugh et al., 2004). Accordingly, the crisis management team bears responsibility for maintaining vigilance toward such signals, enhancing their visibility, and communicating their implications across all levels of management (Mitroff & Alpaslan, 2003). Empirical evidence supports the effectiveness of early warning systems. For example, research by Davis and Karim (2008) and Liu (2018) validated their capacity to identify early indicators of financial instability, thereby enabling corporations to undertake preventive actions before conditions deteriorate. Building on this evidence, future studies could assess the impact of early warning system implementation on firm value, focusing on dimensions such as profitability, financial stability, and cost of capital.

Additionally, future research may explore how organizational arrangements for early warning of financial distress vary across industries, firm sizes, and countries. Such comparative analyses would provide insights into contextual factors that influence the design, effectiveness, and adoption of early warning mechanisms, enriching our understanding of how institutional and structural characteristics shape corporate resilience.

4 Practical implications

The experience of the European Union, particularly Italy, in implementing a mandatory early warning system for financial distress offers valuable insights for SMEs and professional advisors in Brazil. While the European framework stems from a binding legal obligation (Directive (EU) 2019/1023 and its Italian transposition through Legislative Decree No. 14/2019), its underlying rationale transcends legal compliance. It represents a broader shift toward embedding financial rationality and proactive risk management within ordinary business practices. These lessons carry important implications for improving the resilience and sustainability of Brazilian firms.

4.1 Implications for Brazilian SMEs

Brazilian SMEs could build on the European and Italian early warning models to extend them to the Brazilian context. EU and Italian systems institutionalize processes for the early identification, assessment, and mitigation of business risks, reflecting what may be considered "normal" modes of running an enterprise according to sound economic and managerial principles. In the European context, the introduction of mandatory early warning systems regulations was a response to the failure of firms to self-regulate, as many enterprises tended to postpone crisis management until insolvency became inevitable – resulting in significant economic and social costs.

From this perspective, Brazilian SMEs could benefit from adopting similar mechanisms on a voluntary basis, even in the absence of a legal mandate. By integrating organizational, administrative, and accounting tools for the early detection of distress, SMEs can enhance their capacity to anticipate financial risks and preserve long-term viability. Doing so would not only improve their access to finance by reducing perceived credit risk but also foster a culture of accountability and strategic foresight.

Moreover, looking at the EU and Italian contexts can help Brazilian SMEs prepare for potential future regulatory developments. As international financial standards and governance practices continue to evolve, it is possible that Brazil may introduce normative frameworks requiring more formalized approaches to risk prevention. Anticipating such changes would allow firms to position themselves advantageously, minimizing compliance costs. In this sense, the EU experience provides an opportunity for Brazilian SMEs to advance their enterprise risk management systems, using early warning mechanisms as tools for value creation rather than as bureaucratic constraints.

4.2 Implications for Brazilian professionals

The professional community, particularly accountants, auditors, and management consultants, plays a pivotal role in facilitating the diffusion and implementation of early warning systems within Brazilian SMEs. These professionals possess cross-cutting competencies that span financial reporting, management control, and governance, positioning them as essential intermediaries.

First, professionals could assume an educational and awareness-building role, helping entrepreneurs understand that early warning systems are not merely compliance-oriented tools, but rather strategic instruments for long-term resilience and value creation. Many SMEs may initially perceive such mechanisms as unnecessary or burdensome; therefore, consultants and accountants must communicate their relevance in enhancing efficiency, ensuring business continuity, and reducing the likelihood of failure.

Second, professionals are responsible for supporting the concrete design and implementation of early warning models tailored to the characteristics of each enterprise. Given the heterogeneity of SMEs in terms of size, structure, and sector, a "one-size-fits-all" approach is inadequate. Instead, professionals should adopt a context-sensitive, tailored methodology that calibrates the complexity of early warning tools to the firm's operational reality.

Finally, the emergence of early warning systems as a distinct governance and control function may open new areas of specialization and professional development, particularly for young practitioners. As corporate governance in Brazil becomes increasingly aligned with international standards, expertise in preventive crisis management and early warning model design could represent a competitive advantage in the consulting and accounting professions.

5 Conclusion

The European and Italian experiences with mandatory early warning systems for financial distress provide a compelling example of how preventive governance can be institutionalized to promote economic resilience. By embedding early detection and crisis management duties within firms' organizational and accounting frameworks, the EU Directive (2019/1023) has transformed what was once considered good managerial practice into a legal obligation and a marker of due diligence. This shift has significant implications for policymakers and practitioners beyond Europe, particularly in Brazil, where insolvency regulation remains largely reactive and focused on post-crisis intervention.

For Brazilian SMEs, the European approach illustrates how systematic monitoring of financial indicators and the integration of risk management into business processes can serve as effective tools to safeguard continuity and competitiveness. Likewise, it highlights the essential role of accounting and consulting professionals in supporting enterprises to adopt context-appropriate, scalable early warning mechanisms. From a broader perspective, the diffusion of such preventive models contributes to a more sustainable and forward-looking business ecosystem, aligning economic rationality with social responsibility.

Beyond practical and policy implications, this discussion opens promising avenues for academic research. Future studies could investigate whether the mandatory introduction of early warning systems in the EU has influenced firms' internal governance and organizational culture – specifically, whether it has fostered crisis preparedness and readiness as enduring managerial capabilities. The Directive's implementation also offers a natural experimental setting to examine the relationship between early warning mechanisms and firm performance, including profitability, financial stability, and cost of capital. Moreover, comparative analyses across countries, industries, and firm sizes could shed light on the contingent factors that shape the design and effectiveness of early warning frameworks, thereby enriching the cross-national literature on crisis management and corporate resilience.

Ultimately, early warning systems represent more than regulatory instruments—they embody a cultural and organizational commitment to foresight, accountability, and resilience. Encouraging their adoption, whether through formal mandates or voluntary governance initiatives, is therefore fundamental to strengthening firms' capacity to withstand crises and sustain long-term value creation in an increasingly uncertain global environment.

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