

# Exploring Business Resilience Through Financial Statements Analysis

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## Abstract

This study explores business resilience through a financial accounting lens. Business resilience refers to a firm's ability to anticipate and respond to crises, maintain operational continuity, and recover rapidly. In financial terms it is assessed by analyzing the variability of financial results. Resilience depends on various characteristics and capabilities, identified in the literature as drivers of resilience. These drivers represent the actionable levers to improve resilience capabilities and the elements that underline a company's resilience level. The drivers are often qualitative, making them difficult to assess objectively. Using a deductive approach and drawing on existing literature, this study develops logical connections between the drivers of business resilience and indexes of the financial results' variability. Informed by signalling theory, the research aims to address the concerns regarding the lack of practical methodologies to operationalize resilience in a way that is both actionable and useful in practice. The proposed conceptual scheme signals to managers information to shed lights, monitor and manage resilience both ex-ante (to inform decision-making) and ex-post (to evaluate past decisions). Additionally, it signals resilience capabilities to external stakeholders, thereby facilitating more informed decisions regarding an organization of interest. The conceptual scheme highlights the potential of financial statements to depict a company's assets, financial health, and economic performance but also to reveal its resilience capability. Accordingly, this study advocates for a broader use of traditional financial statement analysis as a tool for managerial decision-making.

**Keywords:** Business resilience, Resilience Drivers, Financial Statements Analysis, Conceptual Scheme, Signalling Theory

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## 1. Introduction

In an era marked by turbulence, organizational resilience has emerged as a critical capability for businesses navigating an increasingly volatile and complex global landscape. Over the past two decades, companies have faced a cascade of crises, from 2008's global financial collapse to the Covid-19 pandemic, geopolitical conflicts, and escalating climate-related disruptions. These events, coupled with shifting macroeconomic conditions and supply chain complexities, have underscored the importance of resilience as a means to adapt, survive, and thrive in the face of a polycrisis (Lawrence *et al.*, 2024).

Business resilience is the ability of an organization to proactively anticipate or respond to crises, maintain continuity of operations, and recover rapidly (Ortiz-de-Mandojana and Bansal, 2016; Radic *et al.*, 2022). It is a dynamic ability rooted in various drivers, such as innovation, operational efficiency, strategic foresight, and organizational adaptability. These drivers serve as levers that managers can act upon to bolster resilience, but they can be difficult to synthesize with key performance measures. Rather, they can be represented by narrative or descriptive information rather than quantitative measures. This makes them difficult to operationalize, hindering their effectiveness in providing a comprehensive and actionable picture of a company's resilience (Lee *et al.*, 2013).

From a financial perspective, resilience – defined as a firm's ability to maintain persistent superior performance (Markman and Venzin, 2014) – can be explored by analysing, for example, the variability of key performance metrics, such as the return on equity (Markman and Venzin, 2014), or the absolute percentage change in stock prices combined with the time to return to a the previous price (Desjardine *et al.*, 2019). Financial statement analysis offers insight into the financial drivers behind performance variability and resilience (Arnold, 2008), such as the capital structure, the operating and financial leverage, or the profitability of revenue. While financial analysis is useful for dissecting financial outcomes, it can however not help managers to identify how to act on financial results.

This paper addresses two fundamental research questions. The primary research question is: *What strategic insights can financial statements provide to support managers in the disclosure and management of resilience strategies?* A secondary research question can be developed from this: *What insights can external stakeholders, such as investors or creditors, derive about a company's resilience by analyzing its financial statements?*

To answer these questions, this research develops a conceptual scheme that connects the financial drivers of financial performance (and their variability) to the qualitative drivers of resilience. This research wants to emphasize the strategic and managerial implications of financial statement analysis to explore and enhance resilience capabilities.

From a practical point of view, this study contributes to the growing body of literature on organizational resilience from a financial perspective (e.g., Markman and Venzin, 2014). It also addresses calls from scholars for further evidence of how resilience manifests in organizational contexts (Radic *et al.*, 2022) and supports ongoing efforts to operationalize a concept that otherwise risks remaining abstract and disconnected from managerial practice (Saad *et al.*, 2021). The literature indeed recognizes the development of resilience-related metrics aligned with organizational goals and objectives as a persistent challenge (Dalziell and Mcmanus, 2004).

The paper also offers practical contributions by equipping managers and external stakeholders with tools to better understand and manage resilience through the lens of financial performance and its drivers.

In the paper, Section 2 introduces the concept of organizational resilience, identifies the key drivers of business resilience as recognized in the literature, and outlines the study objective. Section 3 describes the theoretical foundation of the study and the methodological approach. Section 4 presents the study's conceptual output, which is a blueprint to investigate business resilience through financial statement analysis. Section 5 concludes the paper with a discussion and a summary of findings.

## **2. Background**

### **2.1 Resilience definitions and drivers**

Resilience, derived from the Latin word *resilire*, meaning to rebound or bounce back, originally referred to the elastic property of a material that enables it to return to its original form after deformation. Over time, the concept has evolved beyond its physical origin to describe the ability of systems, individuals, and organizations to withstand adversity, adapt to change, and thrive in challenging conditions. In the context of organizations (e.g., Williams *et al.*, 2017; Ducheck, 2020; Hillmann and Guenther, 2021), resilience has gained increasing prominence as businesses navigate an environment characterized by volatility, uncertainty, complexity, and ambiguity. Resilience, in this sense, is not merely the capacity to recover from disruptions but

represents a proactive and dynamic process of adaptation and growth in response to primarily external, but also internal, shocks and adversities.

Literature provides several perspectives on organizational resilience, emphasizing its multidimensional nature. Ortiz-de-Mandojana and Bansal (2016) define organizational resilience as the ability of firms to adapt, endure, and recover rapidly to environmental events and shocks that were out of their control. This definition underscores the importance of agility and forward-looking strategies, allowing organizations to transform challenges into opportunities and suggesting that proactive management and strategic foresight are integral to maintaining operational continuity and competitiveness. Extending these views, Radic *et al.* (2022) emphasize that resilience also form part of various business models that explain why similar organizations respond differently to identical crises, linking it to their capacity to sustain their value proposition and maintain stability in the face of disruption.

Recognizing that resilience is an increasingly vital characteristic for organizations, it becomes essential to explore the operational drivers that underpin this capability. These drivers represent the levers for action on which firms can act to support resilience. Organizations that strategically integrate these drivers into their operations are better equipped to thrive in the face of disruption and change. Table 1 lists the main drivers of business resilience identified in the literature.

*Table 1 – Drivers of business resilience*

Operational efficiency and agility	Efficiency of operations is the ability to perform well with modest resource consumption. Agility, the ability to adapt processes proactively to changing circumstances, further enhances resilience (Bhamra <i>et al.</i> , 2011; Ismail <i>et al.</i> , 2011; Saad <i>et al.</i> , 2021).
Level of assets' technological innovation	Technological innovation, closely tied to operational efficiency and agility, plays a pivotal role in enhancing adaptability and resilience. By investing in or adopting state-of-the-art technologies, firms replace outdated systems with advanced solutions, fostering efficiency, flexibility, and responsiveness (Alberti <i>et al.</i> , 2018; Gunasekaran <i>et al.</i> , 2011).
Innovation	Resilience stems not from one-time innovation but from an organization's ability to innovate continuously. Being a "serial innovator" fosters ongoing competitive advantage. Resilient companies embed processes that enable repeated breakthroughs and industry-impacting changes, ensuring adaptability to evolving markets (Alberti <i>et al.</i> , 2018; De Oliveira and Werther, 2013).
Marketing capability	When there is a crisis or period of difficulty, marketing becomes a driver of resilience when consumers' purchasing power remains largely unaffected. Strong marketing capabilities allow companies to adapt strategies, engage customers, and effectively promote their products. If purchasing power is significantly reduced, resilience relies more on operational efficiency to adjust costs and pricing (Ahmed <i>et al.</i> , 2014).

Resource availability and redundancy	Redundancy refers to the ability to maintain reserves to address unforeseen events. These reserves can help overcome immediate disruptions but require organizational planning to ensure internal efficiency. Financial resources as well as access to funding are crucial for resilience. Intangible resources like reputation, interpersonal relationships, and branding create the conditions for “contextual resilience,” which protects an organization in complex or tightly interconnected situations (Alberti <i>et al.</i> , 2018; Lengnick-Hall and Beck, 2005; Pal <i>et al.</i> , 2014; Perrow, 1984; Saad <i>et al.</i> , 2021; Sheffi, 2005; Sheffi and Rice, 2005).
Digitization	Digitization streamlines communication, simplifies processes, and supports network-like organizational structures. During crises, digital tools enhance operational efficiency, facilitate quick decision-making, and promote innovation, making digital transformation a critical component of resilience strategies (Radic <i>et al.</i> , 2022; Rapaccini <i>et al.</i> , 2020).
Human capital	Organizational resilience is bolstered by the strategic management of human resources, skilled employees, strong leadership, and a collaborative culture. Flexibility, teamwork, and trust among employees foster adaptability and a proactive risk management culture. Organizational learning, driven by inclusive leadership and a shared vision, enables firms to anticipate changes effectively. Experienced managers and leaders also enhance a firm’s ability to navigate disruptions successfully (e.g., Kahn <i>et al.</i> , 2018; Pal <i>et al.</i> , 2014; Sheffi, 2005; Lengnick-Hall <i>et al.</i> , 2011). Robust corporate governance frameworks, policies promoting diversity and inclusion are long term initiatives to support resilience (Desjardine <i>et al.</i> 2019)
Networks and collaboration	Collaborative relationships in supply chains and networks enhance resilience by enabling resource sharing, knowledge transfer, and joint risk management. Partnerships foster innovation and adaptability. Vertical integration can also strengthen control over critical resources, improving competitive positioning (Alberti <i>et al.</i> , 2018; Biggs <i>et al.</i> , 2012; Leiblein, 2011; Sheffi, 2005). By building trust-based relationships with employees, suppliers, customers, and regulatory bodies, organizations can accelerate recovery efforts and restore normal operations more efficiently (Desjardine <i>et al.</i> 2019).
Environmental and social sustainability	Adopting ecofriendly practices, such as waste reduction and energy efficiency, contributes to resilience by lowering costs, improving reputation, and fostering customer loyalty. Sustainable innovations, such as green product design, align with regulatory requirements as well as generate long-term economic and competitive advantages (D’Agostini <i>et al.</i> , 2017; Desjardine <i>et al.</i> 2019). Organizations that prioritize social responsibility often experience enhanced financial performance due to positive brand image, employee satisfaction, and stakeholder trust (Balugani <i>et al.</i> , 2020; Berns <i>et al.</i> , 2009).

## 2.2 Resilience from a financial point of view

In financial terms, business resilience is understood as a firm’s ability to maintain *persistent superior* (financial) *performance*, even in the face of challenging or adverse events (Markman and Venzin, 2014; Radic *et al.*, 2022). Building on this concept, an interesting attempt to operationalize

resilience from a financial perspective in the literature has been developed in the banking sector (Markman and Venzin, 2014). This approach introduced a synthetic indicator to measure resilience, known as VOLARE (VOLatility And RoE), that substantially considers companies with low ROE variability to be resilient.

Rooted in the theory of the Optimal Capital Allocation Model (Markowitz, 1959), VOLARE considers the most resilient banks as those that, during the period analyzed, achieved ROE levels comparable to their peers while exhibiting significantly lower ROE volatility, implying lower risk.

In financial terms, resilience can therefore be interpreted in terms of ROE variability. Considering this, it is important to first consider the elements that impact the ROE amount and thereafter the elements that impact its variability.

Looking to the elements impacting the ROE amount, the DuPont model proves useful in examining the factors affecting ROE. It posits that changes in a firm's ROE can be attributed to its underlying components: profit margin, asset turnover, and financial leverage (or equity multiplier).

$$ROE = \frac{Net\ income}{Revenue} \times \frac{Revenue}{Total\ assets} \times \frac{Total\ assets}{Equity}$$

Among the most relevant factors influencing ROE variability are capital structure, financial leverage, and operating leverage. High debt usage amplifies both gains and losses, increasing ROE variability (Arnold, 2008), financial risk and insolvency risk beyond a certain level. Financial leverage enhances equity returns when ROI exceeds the cost of debt but also raises shareholder risk and reduces financial flexibility due to fixed interest payments. The debt-to-equity ratio and interest coverage ratio are key indicators for analyzing capital structure.

Operating leverage (Contribution margin/Operating income) also impacts ROE variability. High fixed costs make profits highly sensitive to revenue changes, which is particularly relevant in capital-intensive industries. While operating leverage can boost ROE in growth phases, it intensifies losses during downturns. Understanding the trade-offs of both financial and operating leverage is crucial for effective risk management.

The conceptual scheme provided in this research will connect the financial drivers of ROE and ROE variability to the drivers of business resilience, referring to the levers on which to act to affect these financial indexes and then business resilience.

### **3. Theoretical foundation and research methodology**

#### **3.1. Theoretical foundation**

Signalling theory, which builds on the principle of information asymmetry, is the theoretical foundation that informs this study. It posits that when one party possesses more information than another, the former can use signals to communicate relevant characteristics and qualities to the latter. The more effective these signals are, the more they reduce information asymmetry, ultimately leading to better decision-making and outcomes.

In the context of business economics and accounting (e.g., Morris, 1987; Watson et al., 2002; Lys et al., 2015), signalling theory explains how information asymmetry is mitigated through signals transmitted by one entity (typically the company and its management) to another (such as investors, customers, and stakeholders more broadly). By leveraging signals, companies can reduce uncertainty, demonstrate their capabilities and potential, and influence the perception of information recipients.

Since its introduction through Spence's seminal work (1973), signalling theory has inspired numerous theoretical advancements and practical applications. In the specific context of this study, it provides the foundation for a resilience analysis model based on financial statements. The central premise is that companies can signal their resilience capacity through financial statements, whether intentionally or unintentionally.

In some cases, management may consciously communicate the company's resilience attitudes to the external environment through financial disclosures. The benefit for the company can be connected to the image provided and the possibility to access to credit or funding.

In other cases, certain economic and financial performance ratios may inherently reflect a company's resilience, even when management is not explicitly aware of their signalling effect. Particularly in this latter case, financial statements assume a signalling role even within the organization itself. Therefore, while signalling theory originally describes the relationship between an entity and external stakeholders, this study adopts a broader interpretation, emphasizing the possibility that financial statements can also serve as a signal within the company. Such signals may shed light on complex and often uncertain phenomena that management may be only partially aware of or may not recognize at all. Supporting this perspective, research has increasingly highlighted the significant informational and strategic value of financial statements for internal use as well. As supported by valuable research (e.g., Anthony and Govindarajan, 2007), although traditionally seen

primarily as a tool for external stakeholders, financial statements can be strategically employed within the organization for performance monitoring, supporting business decisions, and aligning with strategic objectives. This broader role reinforces their function as a dynamic and essential tool for internal management, further substantiating their capacity to generate signals that inform and guide decision-making at multiple levels. On these premises, this study is informed by signalling theory.

### **3.2. Research methodology**

Building on this theoretical foundation, this study is conceptual and has been developed in two phases. First, a comprehensive literature review was conducted to identify the key drivers of business resilience. Second, in a deductive approach, a logical connection between the drivers of business resilience with their potential financial manifestations – expressed in terms of ROE composition and ROE variability – was constructed. The financial manifestation of the drivers were identified via logical argumentation and internal discussion. In particular the researchers selected the indexes that were able to signal the presence of the resilience driver. In the following section, for each category of driver we will provide a careful discussion about the choice of the indexes. This approach reflects the essence of a conceptual paper: focusing on the integration and proposal of new relationships among constructs, bridging existing theories, connecting insights across disciplines, and expanding the boundaries of current understanding (Gilson and Goldberg, 2015).

The conceptual scheme established in this paper therefore connects financial statement data with the drivers of business resilience, a company's return on equity (ROE), and the underlying factors contributing to ROE fluctuations.

## **4. The conceptual scheme for the analysis of business resilience through financial statements**

This section introduces the conceptual scheme developed in this study to analyze business resilience. The scheme consists of a set of tables (Table 2 to Table 11), each accompanied by an explanation of possible influence of resilience drivers (measured by the proposed financial indexes) with the variability of results. Each table's first column lists the resilience drivers identified in the theoretical background section – tangible levers that can be

managed to achieve higher levels of business resilience. The second column presents the corresponding potential financial manifestations of these drivers.

Table 2 – Operational efficiency

Resilience driver	Resilience indicators
Operational efficiency	Revenue/Total assets
	Revenue/Operating working capital
	Revenue/Personnel expenses
	Revenue/External operating expenses
	Revenue/(Personnel expenses + External operating expenses)

The efficiency of operations, particularly a systematic approach to cost containment, helps to mitigate the variability of financial results and thus support the resilience capacity (Shields and Young, 1992). Operating efficiency is a firm's ability to obtain superior or equal output with reduced input. During periods of rising raw material costs an efficient company may exhibit lower results variability compared to a less efficient competitor. This advantage would stem from the ability to produce the same output with fewer raw material inputs, which reduces overall cost exposure.

Efficiency has an impact on the ROE amount, as it affects the profitability of revenue (Net income/Revenue) as well as the efficiency in capital use and therefore capital rotation (Revenue/Total assets).

The indexes included in this list are described below.

The *Revenue/Total assets* indicator compares invested assets in company operations with output in terms of revenue. This indicates the amount of revenue a company generates for each euro of invested capital.

The *Revenue/Operating working capital* indicator reflects a company's ability to avoid resource waste by minimizing excess working capital, such as unsold inventory or uncollected receivables. This metric serves as a measure of operational efficiency, specifically in a company's capacity to manage working capital effectively and prevent disproportionate growth. A high level of working capital may signal inefficiencies, such as overproduction or challenges in collecting receivables from customers. Since working capital requires financing, excessive levels can lead to additional costs and financial strain.

The *Revenue/Personnel expenses*, *Revenue/External operating expenses*, and *Revenue/(Personnel expenses + External operating expenses)* indicators follow the same logic as the previously discussed metrics. These indicators reflect a company's efficiency in utilizing resources to generate revenue. The relative magnitude of Personnel Expenses and External Operating Expenses, in relation to the volume of products or services produced, also offers valuable insights into the company's broader strategic orientation, particularly regarding its make-or-buy decisions. By analyzing these metrics, it is possible to understand the balance between internal resource allocation and reliance on external services, initiating the possibility of making preliminary considerations on operational agility.

Table 3 – Operational agility

Resilience driver	Resilience indicators
Operational agility	Fixed assets/Total assets
	External operating expenses/Operating expenses
	Leasing assets/Total assets

Operational agility refers to the ability to adapt to change. Agility capacity depends on a company's cost structure, with one possible measure the percentage of fixed and variable expenses. Agility impacts on ROE variability through the operating leverage. A company with high operating leverage – characterized by a high percentage of fixed costs – is inherently riskier and more vulnerable to declines in production and revenue, even if it is more profitable when the breakeven point is achieved. By comparison, a company with lower operating leverage is better positioned to weather such challenges, as its cost structure is more aligned with its operational activity, even if it is less profitable.

In financial statement analysis, agility can also be investigated by comparing external expenses to internal costs. External expenses are generally associated with more flexible structures, while internal costs typically indicate less flexibility due to their inherently fixed nature. Similarly, relying on leasing rather than purchasing fixed assets can enhance flexibility, as leases allow for adjustments in response to changing conditions without the long-term commitment of asset ownership. A company characterized by a low percentage of fixed assets, a preference for external expenses over internal fixed resources, or reliance on leasing rather than outright asset purchases

may be better positioned to adapt to unexpected events or crises, demonstrating greater resilience.

Table 4 – Technological innovation of company assets

Resilience driver	Resilience indicators
Level of assets' technological innovation	Accumulated depreciation/Tangible assets acquisition cost

Technological innovation reflects the assets a company relies on, particularly their modernity and technological sophistication. The age of these assets is a key indicator of a company's commitment to innovation: older assets may suggest obsolescence, while newer assets typically signal a proactive investment in technological advancement. The age of assets can be evaluated by comparing accumulated depreciation to acquisition cost. The *Accumulated depreciation/Tangible assets acquisition cost* indicator provides insight into whether the company leverages the resilience driver of technological innovation of its assets.

New assets can decrease the results' variability, acting through greater efficiency and productivity. They can therefore potentially increase revenue (because of higher production outputs) and/or decrease costs (for example decreasing the cost of resources or electricity) or/and it can reduce product throughput time (and thus delivery time) or enable better qualitative performance, resulting in a premium price recognized by customers.

The possible impact on ROE is an increase in profitability of revenue (Net income/Revenue) due to lower costs or capital rotation (Revenue/Total assets) due to greater revenue. Depreciation of new assets may however be greater than that of older assets (because depreciation is calculated on the historical cost that may increase over time). A new asset will increase the amount of total assets, with a possible negative impact on capital rotation (Revenue/Total assets). There is therefore a trade-off between an increase in revenue and in efficiency versus an increase in assets and in depreciation expenses.

Table 5 – Innovation

Resilience driver	Resilience indicators
Innovation	Capitalized development expenses/Total assets
	Patents/Total assets
	Research and development expenses/Operating expenses

Companies that enhance their resilience through innovation are “serial innovators” (De Oliveira and Werther, 2013). Companies that continuously invest in innovation are more likely to gain a competitive edge, fostering sustained growth and revenues and consistently supporting positive financial outcomes, with possible reduction of results’ variability

Innovation can drive revenue growth, which in turn may enhance profitability and improve capital turnover (Revenue/Total Assets). Additionally, innovation strengthens a company's ability to attract customers and remain competitive, further contributing to revenue growth and potentially optimizing capital turnover.

In financial statements, innovation is reflected through R&D expenses, investments in technological advancements, and new product development (mostly intangible assets). Examining the amount spent on development costs and the relevance of patents on total assets can serve as indicators of a company’s innovation efforts. Similarly, when examining the income statement, it is relevant to consider the proportion of costs allocated to research and development. These metrics are especially relevant for innovation-driven sectors, such as high-tech industries. Additionally, the notes accompanying financial statements often offer qualitative details about a company’s innovative capacity, including information on new processes, products, services, and more.

Table 6 – Marketing capability

Resilience driver	Resilience indicators
Marketing capability	Marketing & advertising expenses/Total expenses
	Marketing-related assets/Total assets
	Revenue/Marketing & advertising expenses

Regarding results variability during difficult times, a robust marketing function can play a stabilizing role in financial performance by attracting more customers than competitors and supporting revenue. It can therefore increase revenue and capital rotation (Revenue/Total Assets).

In financial statements, marketing-related information is primarily reflected as expenses or investments. The income statement includes advertising and promotional costs, market research expenses, event participation fees, and consultancy services. The balance sheet may record intangible assets like brand value or investments in marketing technologies. Additional details, such as marketing strategies or future plans, are often disclosed in the management report or notes to the financial statements.

Table 7 – Resources availability and redundancy

Resilience driver	Resilience indicators
<b>Resources' availability and redundancy</b>	Total debt/Equity
	Cash flow % increase/decrease (year t/t-1)
	Cash flow from operating activities/Cash flow
	Reserves/Equity
	Net Working capital/Total assets
	Accounts payable/Operating expenses x 365

Redundancy is defined as the capability of keeping resources (both financial and non-financial) in reserve to be used to face unexpected events (Sheffi and Rice, 2005). Financial statements can provide insight on the availability of such resources through indicators that serve as measures for assessing the accessibility and redundancy of resources in an organization.

Redundancy can impact ROE and ROE variability in various ways. First, the availability of resources can support a company's capitalization and therefore reduce the debt to equity ratio as well as the interest coverage ratio. On the other hand, high interest expenses in a company's financial statements can provide insight into its financial structure and potential limitations in financial agility (i.e. the possibility of further expanding debt to address temporary liquidity shortages). Such costs often reflect a heavy reliance on debt, which can reduce flexibility by constraining a company's ability to secure additional financing, increasing the burden of debt servicing, and amplifying financial risk, particularly in a rising interest rate environment. The significance of these costs depends on a company's ability to manage them, typically assessed using the interest coverage ratio, which evaluates how many times operating income covers interest obligations.

The ratio *Reserves/Equity* compares the company's retained earnings or reserves to its total equity. A higher ratio signifies a business that has

reinvested profits rather than distributing them, thereby strengthening its financial foundation and providing a buffer against future uncertainties.

Liquidity ratios illustrate a company's ability to meet its obligations and depend on the relationship between the time it takes to convert assets into cash and the maturity of payments. Among the most significant are net working capital and the cash flows. Sufficient liquidity allows for investments, payment of suppliers, and the purchase of materials, thereby reducing potential shocks to economic results.

The indicator *Cash flow % increase/decrease (year  $t/t-1$ )* examines the overall percentage change in cash flow from all activities. A positive change in total cash inflow indicates an improved liquidity and financial flexibility, which is essential for weathering financial disruptions or seizing new opportunities. Within this index it is possible to deepen the analysis by investigating the cash flow from operating activities. An increase in cash flow from operations is a sign that a company is effectively managing its core activities, generating more cash. Conversely, a decrease may signal inefficiencies or challenges in maintaining operational profitability.

Finally, the *Accounts payable/Operating expenses x 365* index represents the average number of days a company takes to pay suppliers, highlighting its use of trade credit as a form of short-term financing. This reflects a company's commercial leverage strategy, which can be a significant indicator of resilience. From a financial perspective, this measure illustrates a company's ability to manage cash flow effectively. By extending payment periods (based on agreed terms), a firm can preserve liquidity, allocate funds to critical operations, and navigate periods of financial strain. By relying on supplier credit rather than external debt to finance its operations, a company avoids the need to take on additional borrowing and pay interests. It also signals the strength of supplier relationships, as favourable payment terms often reflect trust and collaboration, which are valuable during crises. As in other cases, the interpretation of this indicator however requires caution and should be combined with the analysis of other indicators: excessively long payment periods might suggest cash flow difficulties, while very short periods could indicate underutilized financial flexibility.

In summary, by analyzing the availability and redundancy of resources indicators one can gain insight into a company's ability to handle financial obligations, adapt to market changes, and maintain a long-term stable financial position. The balance between resources, liabilities, and cash flow is essential for ensuring that a company remains resilient, sustainable, and able to withstand economic uncertainties.

Table 8 – Digitization

Resilience driver	Resilience indicators
Digitization	Digitization expenses/Total expenses
	Digitization assets/Total assets

Financial statements and notes may provide information about the number of investments in digitizing internal systems and processes. An increase in investments in digitization can in the long run improve results and decrease their variability due to higher efficiency and therefore by improving the profitability of revenue (Net income/Revenue) and real-time monitoring and control of business processes.

Table 9 – Human capital

Resilience driver	Resilience indicators
Human capital	Personnel expenses/Operating expenses
	Personnel training expenses/Personnel expenses
	Personnel benefits expenses/Personnel expenses

Workforce investments can impact the ROE amount indirectly by acting primarily on other resilience drivers. Trained employees allow a greater capacity to solve problems and be more efficient (impacting the profitability of revenue) and stimulate greater capacity for innovation, to compete, and generate revenue (impacting capital rotation). It is essential to assess trends. An increase in these metrics may initially lead to reduced short-term performance due to increased underlying costs. Nonetheless, in the long term, a well-trained, specialized and workforce can significantly contribute an improvement of the internal climate and create the ground for a persistent superior performance and volatility reduction.

It is important to acknowledge that this metric can be influenced by the nature of the business and its production processes. In highly automated production systems or manufacturing, the costs associated with assets may for example outweigh those related to employees. In this respect, it becomes valuable to investigate other factors, such as the benefits provided to employees or the expenses incurred for employees' training (the latter may not be readily discernible in financial statements if the accompanying notes lack sufficient details.). Other relevant aspects related to this topic could be considered; however, they have not been included for the sake of simplicity in

the proposed framework. For instance, observing over time that a company allocates fewer resources to risk provision funds or experiences a reduction in costs related to employee disputes can indicate lower corporate risk and improved human resource management. Moreover, reserves (already analyzed in previous sections of the framework) highlight the company's tendency to safeguard itself against potential future challenges.

*Table 10 – Networks and collaboration*

<b>Resilience driver</b>	<b>Resilience indicators</b>
<b>Networks and collaboration</b>	Equity interests in other companies

Interorganizational relationships in the value chain facilitate the transfer and exchange of complementary knowledge between partners (Leiblein, 2011; Lippman and Rumelt, 2003).

Networks may indirectly impact ROE and its variability in various ways. In times of crisis, a company can access resources from its network partners. These resources go beyond tangible assets and include knowledge, experience, and other intangible assets that can be critical for navigating difficult periods. Sharing knowledge can support innovation, efficiency, and support other functions, such as marketing.

The notes to financial statements can be useful for identifying other strategic investments in financial assets and for gaining additional insights into a company's network. These indicators provide an indication of whether a company can depend on a strong network during crises or in the face of significant environmental changes that require decisive action.

*Table 11 – Environmental and social sustainability*

<b>Resilience driver</b>	<b>Resilience indicators</b>
<b>Environmental and social sustainability</b>	Investments in green assets/Total assets
	Environmental and social sustainability expenses/Total expenses
	R&D expenses dedicated to green innovations/Operating expenses

Environmental and social sustainability can impact ROE and its variability in the long run by acting on other resilience drivers. While sustainability efforts may initially entail higher costs, they can lead to enhanced corporate reputation that may increase revenue and efficiency (for example an

investment in a photovoltaic system to reduce energy costs) that can positively impact the net income. Reduced operational risks can impact resource availability and the cost of debt, and lead to greater resilience over time, supporting stable and sustainable growth.

The proposed indicators provide valuable insights into a company's commitment to environmental and social sustainability, as well as its strategic focus on green innovation. Their analysis in the context of financial statements highlights the alignment of corporate strategies with sustainability goals and global environmental standards.

Possible relevant indexes are *Investments in green assets/Total assets* (measuring the proportion of total assets allocated to green investments), *Environmental and social sustainability expenses/Total expenses* (representing the share of total expenditure dedicated to environmental and social sustainability initiatives), *Research and development expenses dedicated to green innovations/Operating expenses* (highlighting the extent of R&D investment, specifically targeting sustainable innovation as a percentage of total operating expenses).

The drivers presented have an impact on ROE variability and ROE as illustrated for each driver. They may help, to avoid or mitigate the severity of potential losses by providing a solid structural and strategic foundation. This reduces the overall impact of crises, enabling firms to maintain operational stability and sustained financial performance even in turbulent times.

Some drivers such as those related to network and human resources act primarily on other drivers of the framework, thus they have a long term impact on financial measures. On the other side, there are other drivers that can influence financial measures more directly and therefore in a shorter period. However, even if with different timing, investing in those drivers represents a proactive approach to manage resilience, ensuring that businesses are better equipped to navigate uncertainties and sustain competitive advantage in evolving economic landscapes (as also suggested by Dejardine et al. 2019).

The relationships among drivers are complex, not always unidirectional, and not easily generalizable across all contexts. This work highlights that there are relationships but leaves it to further research and practical application of the conceptual scheme to bring greater clarity to potential connections.

## 5. Discussion and conclusions

This study develops a conceptual scheme that leverages financial statements for a strategic use by identifying linkages between ROE variability and the financial manifestations of the qualitative drivers of organizational resilience.

It is not possible to identify deterministic cause-and-effect relationship between resilience strategies (expressed in narrative forms) and synthetic financial results (in this case ROE and its variability).

Therefore this research propose an alternative approach. Instead of identifying direct relationship between resilience strategies synthetic financial results, this relationship is investigated indirectly, by the media of the financial manifestation of resilience strategies. The framework this study proposes attempts to make the relationship between resilience strategies and the variability of economic and financial results more direct by representing the strategies through a set of detailed economic and financial indicators. These indicators represent a possible financial manifestation of resilience strategies and an alternative way to portray them. By presenting resilience strategies in detail through economic and financial indicators, the framework aims to make the relationship between these strategies and the variability of economic and financial results more objective.

The research was guided by two key questions: *What strategic insights can financial statements provide to support managers in the disclosure and management of resilience strategies? What insights can external stakeholders, such as investors or creditors, derive about a company's resilience from analyzing its financial statements?*

The proposed conceptual scheme addresses the first research question by identifying key indicators and relevant information from financial statements that signal specific resilience drivers. While signalling theory traditionally focuses on reducing information asymmetry between internal and external stakeholders, this research applies it to internal analysis as well.

By systematically identifying and interpreting resilience signals within financial statements, the conceptual scheme provides a structured methodology to help management develop resilience-oriented strategies, enhance existing capabilities, or uncover resilience potential previously unrecognized. It offers a holistic, entity-level view of the cumulative effects of multiple, often disconnected, actions taken at the business unit or functional level to improve resilience, enhance related performance, and ultimately increase ROE or reduce its variability.

Additionally, the framework serves as an ex-post control tool, allowing managers to evaluate past decisions by analyzing the financial impact of implemented resilience strategies. Beyond top management, internal stakeholders such as employees can also benefit, gaining insights into their company's resilience capacity.

In response to the second research question, the conceptual scheme equips external stakeholders, such as investors and creditors, with a tool to evaluate a company's resilience capabilities based on financial statement data. In this respect the conceptual framework can be intended as a tool that, within the signalling theory, can reduce the information asymmetry and enhance the capacity the "signalling power" of the financial statement. What is interesting in this case is that, while signalling theory concern the willingness of the company to signal some key information, in this case an external users can apply the framework to enhance the signalling power of the financial statements, even without the specific intention of the company. The application of the framework can be therefore particularly beneficial for investors and creditors to reduce information asymmetry even if absence of a specific interest from the company. In turn, enhancing the signalling power of financial information has advantage for the company that, by showing its resilience ability, can have greater possibilities to attract investors and creditors.

Looking to the scheme's use and interpretation, several aspects must be considered. First, it is important to emphasize that a correct and meaningful interpretation of the indicators derived by means of the application in practice of the conceptual scheme requires the analysis of trends in time and space, thus over a significant number of financial years and in comparison with peer companies or competitors. While some indicators may have an immediate capacity to show resilience drivers, mostly of the indicators may have a low standalone informative power but a much higher meaning when analyzed over time and against benchmark.

Second, not all indicators are equally relevant for every company, because of well-known contingency factors. A firm pursuing a low-cost strategy may prioritize efficiency-based resilience strategies, while a service-oriented organization might focus more on flexibility than a manufacturing firm. Similarly, a high-tech company may emphasize innovation-driven strategies. Selecting the appropriate indicators therefore requires a preliminary analysis of a company's overall strategy and the broader context in which it operates.

Furthermore, examining financial statements from a strategic perspective underscores the importance of other analyses, supported by non-financial,

quantitative, and qualitative information presented in the accompanying documents and commentaries to the financial statements. In this regard, certain aspects, in particular, deserve to be highlighted. The breakdown of revenue by business line helps to determine whether a company relies too heavily on a single product or service. Greater diversification enhances resilience to market-specific shocks. A company with revenue spread across multiple business lines is better protected against crises that may affect a specific segment. Similarly, the geographic distribution of revenue reveals dependency on specific markets. Companies operating in diverse markets can offset declines in one region with growth in another. Operating in geographically unstable areas or regions that are prone to economic or political crises could however introduce additional risks.

Another consideration is a company's size as an index of its flexibility (Saad *et al.*, 2021). Measuring firm size can help add information about a company's flexibility: the smaller a firm, the higher its flexibility capacity, because it is easier to adapt routines and processes.

Another key element is the location of a company's production facilities. A balanced geographical distribution of plants mitigates operational risks such as logistical disruptions, political instability, or natural disasters. A company with well-distributed facilities demonstrates greater resilience compared to one that is heavily reliant on a single region.

Understanding the broader economic context and industry trends provides insight into a company's positioning relative to external developments. The relationship between a company's performance and that of its sector or the general economy is a critical indicator. For example, companies operating in cyclical industries, such as the construction or automotive ones, often experience greater earnings variability (Peters and Waterman, 1982). Similarly, price volatility in sectors like energy and manufacturing exacerbates earnings fluctuations (Dierickx and Cool, 1989). Companies based in countries with stable economies and prudent fiscal policies generally exhibit lower ROE variability (Briguglio *et al.*, 2009).

If a company grows in line with its sector, it benefits from favorable conditions but may lack distinctive competitiveness or adaptability. Conversely, a company outperforming its sector reflects a competitive advantage, strong innovation capabilities, or effective market positioning. Resilience is particularly evident in companies that grow even in contracting sectors or markets, highlighting adaptability, operational flexibility, and the ability to seize opportunities in challenging environments. On the other hand, underperformance relative to a sector or a decline not aligned with market trends may

indicate structural or strategic weaknesses, reducing a company's long-term resilience.

Another critical aspect is a company's ability to identify and address key risks. In this respect, resilient companies place considerable focus on the strategic planning process, as it is the adaptive mechanism that allows anticipating changes in the environment and designing a firm's competitive response with a likely high fit with the forecast changes.

The management report often highlights strategic risks (such as technological advancements or shifting consumer preferences), operational risks (such as supply chain and distribution issues), and financial risks (such as liquidity, currency, or credit challenges). Resilience is not only measured by the ability to identify these risks but also by clear strategies to mitigate them, such as diversified suppliers, liquidity management policies, or innovations to maintain competitiveness.

A wealth of information on strategic planning capabilities, leadership, and culture can be derived from financial statement notes. For instance, one can examine whether there is a dedicated section in the notes that addresses a company's prospects, or initiatives aimed at enhancing managerial capabilities (such as specialized training programs). An organizational chart can show the presence of units dedicated to supporting strategy development (for example the management accounting function). The quality of strategic planning and alignment between objectives and results are key indicators of resilience.

This study's theoretical contributions include advancing the understanding of business resilience and operationalizing its concept (Radic *et al.*, 2022). The research enriches the literature on business resilience by providing a practical scheme that bridges theoretical insights and managerial application. By illustrating how financial statement analysis can be employed to assess a company's resilience potential, this paper highlights the strategic value of financial data. It shows that financial statements not only offer insights into an organization's assets, financial position, and economic performance, but also reveal its capacity to persist, adapt, or transform in the face of challenges.

This study has limitations that present opportunities for further refinement and development of the proposed conceptual scheme. The scheme is designed to establish foundational guidelines within which a company (or external actors) can operate, allowing for the development of more detailed and tailored versions suited to specific activities and industries. Future

studies could therefore use case studies or surveys to validate, detail and further enhance the conceptual scheme developed in this paper.

Additionally, quantitative research could contribute to this effort by testing the proposed scheme on large samples of companies. Such studies could compare trends in composite indicators of financial performance variability with the resilience indicators identified here. They could also explore correlations between resilience drivers and firm performance variability over time, helping to validate or refine the relationships outlined in the scheme. Furthermore, future research could incorporate factors not addressed in this study, such as the influence of industry sector, competitive strategy, and external market dynamics, to provide a more comprehensive understanding of resilience in different business contexts.

## References

- Ahlawat, H., Hatami, H., Del Mar Martínez, M., Natale, A., Poppensieker, T., and Raggl, A. (2022). A defining moment: How Europe's CEOs can build resilience to grow in today's economic maelstrom. *McKinsey Quarterly*, McKinsey and Company.
- Ahmed, M. U., Kristal, M. M., and Pagell, M. (2014). Impact of operational and marketing capabilities on firm performance: Evidence from economic growth and downturns. *International Journal of Production Economics*, 154, 59-71. <https://doi.org/10.1016/j.ijpe.2014.03.025>
- Alberti, F. G., Ferrario, S., and Pizzurno, E. (2018). Resilience: Resources and strategies of SMEs in a new theoretical framework. *International Journal of Learning and Intellectual Capital*, 15(2), 165-188. <https://doi.org/10.1504/IJLIC.2018.091969>
- Anthony, R. N., and Govindarajan, V. (2007). *Management control systems* (12th edn.). Boston: McGraw-Hill.
- Arnold, J. M. (2008). *Do tax structures affect aggregate economic growth? Empirical evidence from a panel of OECD countries* OECD Economics Department Working Papers, No. 643, OECD Publishing. <https://doi.org/10.1787/236001777843>
- Balugani, E., Butturi, M. A., Chevers, D., Parker, D., and Rimini, B. (2020). Empirical evaluation of the impact of resilience and sustainability on firms' performance. *Sustainability*, 12(5), 1742. <https://doi.org/10.3390/su12051742>
- Berisha Qehaja, A., and Ismajli, H. (2018). Financial analysis as a strategic tool: The case of SMEs in the Republic of Kosova. *Business Theory and Practice*, 19, 186-194. <https://doi.org/10.3846/btp.2018.19>
- Berns, M., Townend, A., Khayat, Z., Balagopal, B., Reeves, M., Hopkins, M. S., and Kru-schwitz, N. (2009). The business of sustainability: what it means to managers now. MIT Sloan Management Review.
- Bhamra, R., Dani, S., and Burnard, K. (2011). Resilience: The concept, a literature review and future directions. *International Journal of Production Research*, 49(18), 5375-5393. <https://doi.org/10.1080/00207543.2011.563826>

- Biggs, D., Hall, C. M., and Stoeckl, N. (2012). The resilience of formal and informal tourism enterprises to disasters: Reef tourism in Phuket, Thailand. *Journal of Sustainable Tourism*, 20(5), 645-665. <https://doi.org/10.1080/09669582.2011.630080>
- Briguglio, L., Cordina, G., Farrugia, N. and Vella, S. (2009). "Economic Vulnerability and Resilience : Concepts and Measurements" Oxford Development Studies, Vol. 37 (3): 229 – 247.
- D'Agostini, M., Tondonlo, V. A. G., Camargo, M. E., Dullius, A. I. S., and Russo, S. L. (2017). Relationship between sustainable operations practices and performance: A meta-analysis. *International Journal of Productivity and Performance Management*, 66(8), 1020-1042. <https://doi.org/10.1108/IJPPM-11-2015-0168>
- Dalziell, E. P., and Mcmanus, S. T. (2004). Resilience, vulnerability, and adaptive capacity: Implications for system performance. *International Forum on Engineering Decision Making*, 17.
- David, F. R. (2011). *Strategic management concepts and cases* (13th ed.). Prentice Hall International, Incorporated.
- De Oliveira Teixeira, E., and Werther Jr, W. B. (2013). Resilience: Continuous renewal of competitive advantages. *Business Horizons*, 56(3), pp. 333-342. <https://doi.org/10.1016/j.bushor.2013.01.009>
- Desjardine, M., Bansal, P., & Yang, Y. (2019). Bouncing Back: Building Resilience Through Social and Environmental Practices in the Context of the 2008 Global Financial Crisis. *Journal of Management*, 45(4), 1434-1460. <https://doi.org/10.1177/0149206317708854>
- Dierickx, I., and Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management Science*, 35(12), 1504-1511.
- Duchek, S. (2020). Organizational resilience: a capability-based conceptualization. *Business Research*, 13(1), 215-246. <https://doi.org/10.1007/s40685-019-0085-7>
- Gilson, L. L., and Goldberg, C. B. (2015). Editors' comment: So, what is a conceptual paper? *Group and Organization Management*, 40(2), 127-130. <https://doi.org/10.1177/1059601115576425>
- Gunasekaran, A., Rai, B. K., and Griffin, M. (2011). Resilience and competitiveness of small and medium size enterprises: An empirical research. *International Journal of Production Research*, 49(18), 5489-5509. <https://doi.org/10.1080/00207543.2011.563831>
- Hillmann, J., & Guenther, E. (2021). Organizational resilience: a valuable construct for management research?. *International Journal of Management Reviews*, 23(1), 7-44. <https://doi.org/10.1111/ijmr.12239>
- Ismail, H. S., Poolton, J., and Sharifi, H. (2011). The role of agile strategic capabilities in achieving resilience in manufacturing-based small companies. *International Journal of Production Research*, 49(18), 5469-5487. <https://doi.org/10.1080/00207543.2011.563833>
- Kahn, W. A., Barton, M. A., Fisher, C. M., Heaphy, E. D., Reid, E. M., and Rouse, E. D. (2018). The geography of strain: Organizational resilience as a function of intergroup relations. *Academy of Management Review*, 43(3), 509-529. <https://doi.org/10.5465/amr.2016.0004>
- Lawrence, M., Homer-Dixon, T., Janzwood, S., Rockstöm, J., Renn, O., and Donges, J. F. (2024). Global polycrisis: the causal mechanisms of crisis entanglement. *Global Sustainability*, 7, e6, 1-16. <https://doi.org/10.1017/sus.2024.1>
- Lee, A. V.; Vargo, J., and Seville, E. (2013). Developing a tool to measure and compare organizations' resilience. *Natural Hazards Review*, 14(1), 29-41. [https://doi.org/10.1061/\(ASCE\)NH.1527-6996.0000075](https://doi.org/10.1061/(ASCE)NH.1527-6996.0000075)

- Leiblein, M. J. (2011). What do resource- and capability-based theories propose? *Journal of Management*, 37, 909-932. <https://doi.org/10.1177/0149206311408321>
- Lengnick-Hall, C. A., and Beck, T. E. (2005). Adaptive fit versus robust transformation: How organizations respond to environmental change. *Journal of Management*, 31(5), 738-757. <https://doi.org/10.1177/0149206305279367>
- Lengnick-Hall, C. A., Beck, T. E., & Lengnick-Hall, M. L. (2011). Developing a capacity for organizational resilience through strategic human resource management. *Human Resource Management Review*, 21(3), 243-255. <https://doi.org/10.1016/j.hrmr.2010.07.001>
- Lippman, S. A., and Rumelt, R. P. (2003). A bargaining perspective on resource advantage. *Strategic Management Journal*, 24(11), 1069-1086. <https://doi.org/10.1002/smj.345>
- Lys, T., Naughton, J. P., and Wang, C. (2015). Signaling through corporate accountability reporting. *Journal of Accounting and Economics*, 60(1), 56-72. <https://doi.org/10.1016/j.jacceco.2015.03.001>
- Markman, G. M., and Venzin, M. (2014). Resilience: lessons from banks that have braved the economic crisis — And from those that have not. *International Business Review*, 23(6), 1096–1107. <https://doi.org/10.1016/j.ibusrev.2014.06.013>
- Markowitz, H. M. (1959). *Portfolio selection; efficient diversification of investments*. John Wiley and Sons.
- Morais-Storz, M., Stoud Platou, R., and Berild Norheim, K. (2018). Innovation and metamorphosis towards strategic resilience. *International Journal of Entrepreneurial Behavior and Research*, 24(7), 1181-1199. <https://doi.org/10.1108/IJEBr-11-2016-0369>
- Morris, R. D. (1987). Signalling, agency theory and accounting policy choice. *Accounting and Business Research*, 18(69), 47-56. <https://doi.org/10.1080/00014788.1987.9729347>
- Ortiz-de-Mandojana, N., and Bansal, P. (2016). The long-term benefits of organizational resilience through sustainable business practices. *Strategic Management Journal*, 37(8), 1615-1631. <https://doi.org/10.1002/smj.2410>
- Pal, R., Torstensson, H., and Mattila, H. (2014). Antecedents of organizational resilience in economic crises — an empirical study of Swedish textile and clothing SMEs. *International Journal of Production Economics*, 147, 410-428. <https://doi.org/10.1016/j.ijpe.2013.02.031>
- Perrow, C. (1984). *Normal accidents: Living with high-risk technologies*. Basic Books.
- Peters, Thomas J., and Robert H. Waterman Jr. (1982) "In Search of." Of Excellence, New York: Harper and Row.
- Radic, M., Herrmann, P., Haberland, P., and Riese, C. R. (2022). Development of a business model resilience framework for managers and strategic decision-makers. *Schmalenbach Journal of Business Research*, 74(4), 575-601 <https://doi.org/10.1007/s41471-022-00135-x>
- Rapaccini, M., Saccani, N., Kowalkowski, C., Paiola, M., and Adrodegari, F. (2020). Navigating disruptive crises through service-led growth: The impact of Covid-19 on Italian manufacturing firms. *Industrial Marketing Management*, 88, 225-237 <https://doi.org/10.1016/j.indmarman.2020.05.017>
- Saad, M. H., Hagelaar, G., Van der Velde, G., and Omta, S. W. F. (2021). Conceptualization of SMEs' business resilience: A systematic literature review. *Cogent Business and Management*, 8(1), 1-33. <https://doi.org/10.1080/23311975.2021.1938347>

- Sheffi, Y. (2005). *The resilient enterprise: Overcoming vulnerability for competitive advantage*. Pearson Education.
- Sheffi, Y and Rice, B. J. (2005). A supply chain view of the resilient enterprise. *MIT Sloan Management Review, Fall 2005*.
- Spence, M. (1973). Job market signaling. *The Quarterly Journal of Economics*, 87(3), 355-374.
- Watson, A., Shrives, P., and Marston, C. (2002). Voluntary disclosure of accounting ratios in the UK. *The British Accounting Review*, 34(4), 289-313.  
<https://doi.org/10.1006/bare.2002.0213>
- Williams, T. A., Gruber, D. A., Sutcliffe, K. M., Shepherd, D. A., & Zhao, E. Y. (2017). Organizational response to adversity: Fusing crisis management and resilience research streams. *Academy of management annals*, 11(2), 733-769. <https://doi.org/10.5465/annals.2015.0134>