

**Organizational preparedness for extreme events in the Spanish banking sector:  
Integrating risk measurement, management, and organizational mindfulness**

## **ABSTRACT**

This research examines organizational preparedness for extreme events in the financial sector as a multidimensional construct encompassing risk measurement, risk management, risk avoidance, and organizational mindfulness.

Drawing on four established theoretical perspectives: Extreme Value Theory, Organizational Resilience Theory, Normal Accident Theory, and High Reliability Theory, this study examines how these modalities shape perceptions of the organizations' preparedness for potential extreme events. Survey data from 315 professionals in risk-related roles in the Spanish financial sector were analyzed using Structural Equation Modeling.

The results show that quantitative risk measurement and resilience tools for preparation, response, and recovery are positively associated with perceived preparedness for extreme events. Perceiving the financial system as complex and tightly coupled is negatively related to preparedness, although the relationship is only marginally significant.

Organizational mindfulness was found to have a strong indirect effect on perceived preparedness by strengthening risk measurement and management, while mitigating perceptions of systemic vulnerabilities.

This research highlights that preparedness for extreme events in the financial sector is shaped by analytical risk measurement, risk management practices, and an overall risk culture of attentiveness, with implications for strengthening organizational approaches to high-impact occurrences of both financial and non-financial nature.

**KEY WORDS:**

Organizational preparedness for extreme events, Risk management, Banking sector,  
Organizational resilience, Organizational mindfulness

**JEL Classification Codes:**

G01: Financial crises

G21: Banks; Depository Institutions; Micro Finance Institutions; Mortgages

G32: Financing Policy • Financial Risk and Risk Management • Capital and Ownership

Structure • Value of Firms • Goodwill

# 1 INTRODUCTION

Periodic financial disruptions have a profound impact on global economies. The 2008 Global Financial Crisis (GFC), which occurred soon after the implementation of Basel II's risk-based capital adequacy framework (Caruana, 2005), dramatically reshaped the banking sector. Although internal models under Basel II, which aimed to align capital requirements with the actual risk profile of banks, predicted a 99.9% safety threshold, the GFC exposed major flaws in these frameworks, evidencing the inadequacy of banks' risk models to quantify risk and determine the level of capital needed to absorb potential losses. In Spain, the number of banking groups declined from 55 in 2009 to 10 by 2021 (see Figure 1), and taxpayer-funded bailouts exceeded € 60 billion (Otero-Iglesias et al., 2016).

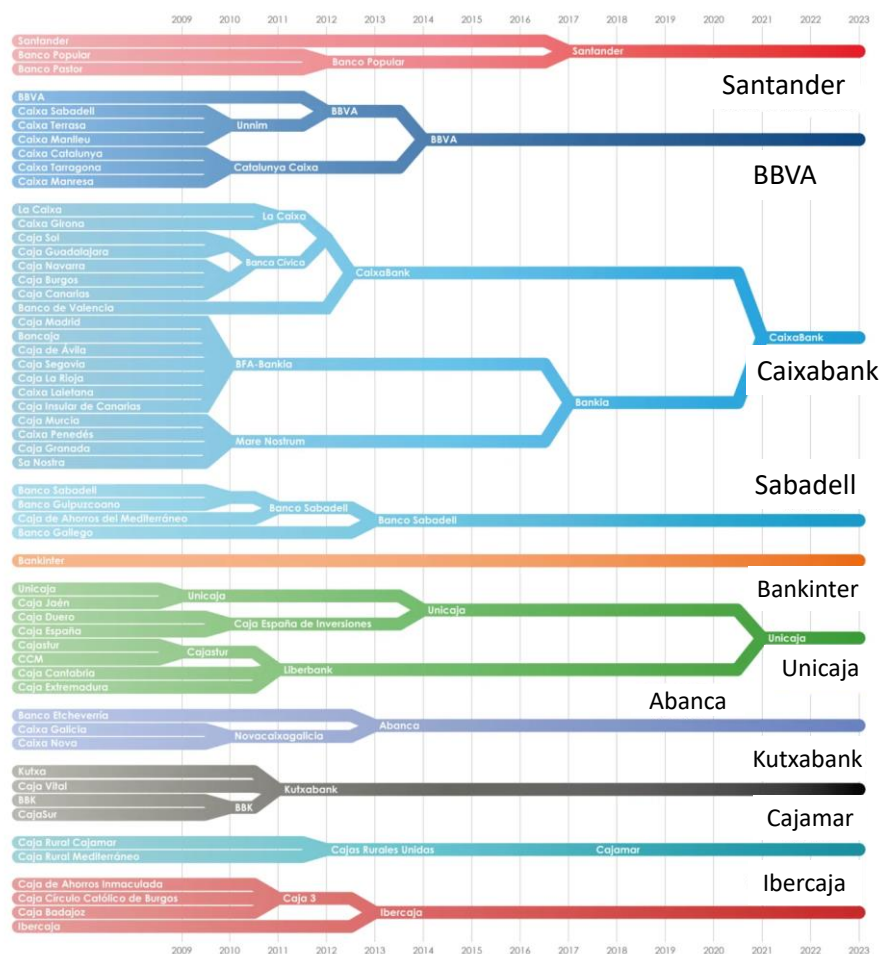


FIGURE 1 Evolution of banking entities in Spain (2009-2023) Source: Merino (2023).

Despite subsequent regulatory advancements, the recent failures of Credit Suisse and Silicon Valley Bank (Enria, 2023) highlight vulnerabilities in traditional risk management models still ongoing. Many of the extreme events that threaten a bank's viability originate outside traditional financial risk categories, arising from operational, cybersecurity, conduct-related, fraud, or reputational disruptions. Exposure to both financial and non-financial risks underscores the need to understand how organizations prepare for and respond to the full range of extreme events they may face.

Organizational preparedness for these extreme events can be conceptualized through three exhaustive modalities of orientation toward risk: measurement, management, and avoidance. Within each modality, representative theoretical frameworks offer promising alternative perspectives: Extreme Value Theory (EVT) emphasizes robust statistical tools for modeling rare events in the context of risk measurement (Embrechts et al., 1997); Organizational Resilience Theory (ORT) highlights the sufficiency of tools and routines that enable organizations to prepare for, manage, and recover from extreme events in the context of risk management (Williams et al., 2017); and Normal Accident Theory (NAT) underscores the inherent risks that arise from complex interactions and tightly coupled systems in the context of risk avoidance (Perrow, 1981). In addition, High Reliability Theory (HRT) suggests that organizational mindfulness, conceptualized as a cultural orientation of attentiveness, can strengthen preparedness by enhancing the effectiveness of the measurement and management practices while counterbalancing the constraints of avoidance (Weick et al., 1999). However, the combined empirical applicability of these frameworks within the financial sector remains unexplored.

This study addresses this gap by examining perceptions of Spanish financial sector professionals regarding organizational preparedness, employing Structural Equation

Modeling (SEM) to analyze the relationships and mediating mechanisms across these constructs. Specifically, it tests a multidimensional model of preparedness that integrates EVT, ORT, NAT, and HRT to explain how measurement, management, avoidance, and mindfulness jointly configure organizations' capacity to confront extreme events. Although tested within the financial sector, the model offers insights relevant to other domains exposed to low-probability, high impact risks. It provides an analytical framework for strengthening governance and decision-making related to extreme events. Evaluating perceptions of preparedness is particularly relevant because it reveals how organizations are bound to act in the absence of prior testing or real-world crises, providing a forward-looking proxy for their latent capacity to anticipate and adapt to such events.

Our research makes several contributions to the literature: it is the first empirical test of a theoretically grounded, multidimensional model of preparedness for extreme events in the financial sector context; it clarifies how measurement, management, avoidance, and mindfulness interact to enhance organizational resilience; and it extends the application of organizational mindfulness beyond its traditional settings. By providing a clear, empirical understanding of how these frameworks collectively contribute to preparedness for extreme events, this study offers practical insights for enhancing risk management strategies within financial institutions. Figure 2 presents the conceptual model that structures the study and summarizes the hypothesized relationships among its core constructs.

The remainder of this paper is organized as follows. Section 2 develops the theoretical framework and research hypotheses. Section 3 outlines the research methodology for the survey design and measurement. Section 4 reports the empirical results, and Section

5 discusses the findings, before concluding with limitations and avenues for future research.

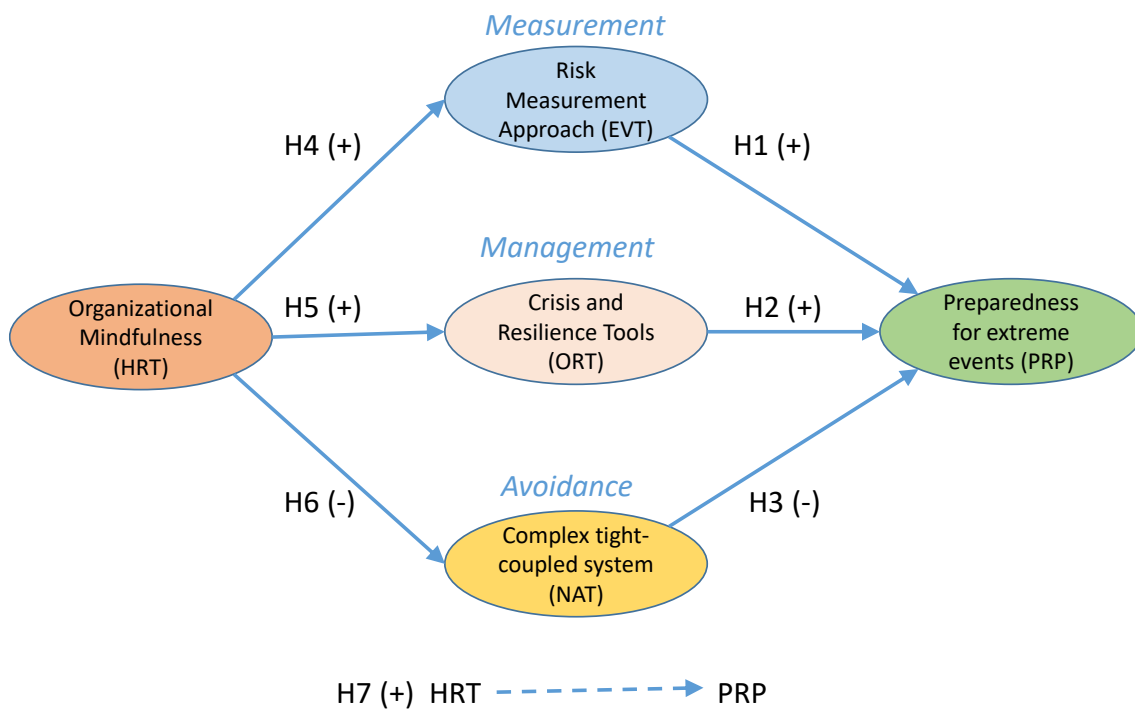


FIGURE 2 Hypothesized model

## 2 THEORETICAL BACKGROUND

### 2.1. Preparedness for extreme events

Preparedness for extreme events refers to an organization’s latent capacity to sustain reliable functioning in the face of low-probability, high-impact disruptions that can neither be fully prevented nor entirely anticipated. Such events are defined by Hällgren et al. (2018) as situations with potentially severe and unbearable consequences beyond organizational control. In this context, preparedness represents a latent organizational condition that enables anticipation, absorption, and adaptation under such circumstances (Williams et al., 2017) and refers to both events of a financial and a non-financial nature, such as cybersecurity events or technological disruptions.

In contexts where such phenomena cannot be directly observed, perceptions of preparedness for extreme events can serve as a reasonable proxy, provided that

respondents have informed and relevant experience with the issue. In the absence of an actual extreme event against which preparedness could be objectively tested, and given that prior empirical research has largely relied on retrospective proxies linked to past performance and financial stability (see, for instance, Otero-González et al., 2020), perceptual data capture the organization's potential ability to anticipate, respond, and avoid, providing a valid operationalization of an otherwise unobservable construct. Moreover, these perceptions are not merely diagnostic but have practical implications, as they influence how organizations prioritize and direct resources toward protection, risk management, or system resilience. The professionals surveyed in this paper typically hold positions responsible for assessing risks, ensuring regulatory compliance, and managing financial and operational controls. Their views on preparedness and the likelihood of extreme events can shape investment prioritization. A heightened sense of vulnerability or insufficient preparedness can prompt additional protective actions, whereas a perception of high preparedness may indicate confidence in existing capacities. These perceptions therefore, have tangible behavioral and financial consequences that underscore their analytical relevance.

## **2.2. Risk measurement and Extreme Value theory**

Banks differ from other industries by generating value not only from their assets but also from their liabilities, primarily by attracting low-cost deposits (Paul, 2023). A bank's perceived risk significantly influences its ability to raise retail or wholesale funding, making risk measurement and management an essential component of its business model (Stulz, 2015).

Over the past decades, risk measurement and management in banking have given rise to tools like JP Morgan's CreditMetrics and RiskMetrics (Crouhy et al., 2000), while Value-at-Risk (VaR) has emerged as a widely used metric to quantify the maximum

expected monetary loss over a specified horizon and confidence level, thereby enhancing comparability and comprehension (Jorion, 1996). Regulators endorsed this quantification-driven risk culture: Basel I (1988) introduced capital requirements based on standardized risk weights, while Basel II (2004) moved toward more refined, risk-sensitive metrics. These metrics and risk models provide essential decision-making inputs (Mikes, 2011).

However, the Gaussian assumptions underlying the regulatory ratings-based risk models (Gordy, 2003) overlook the fat tails observed in financial markets (Embrechts et al., 1999; Mandelbrot, 1963). Extreme events such as the 1987 crash, when the S&P 500 dropped 20.4% in a single day, or the 2008 Global Financial Crisis, starkly exposed these limitations, sparking criticism from the financial media (Salmon, 2009), practitioners (Bookstaber, 2017), regulators (Haldane & Nelson, 2012; Kay & King, 2020), and academic architects of the models themselves (Embrechts, 2017; Stiglitz, 2018).

To address the inability of Gaussian-based models to capture tail risk, researchers had long advocated for Extreme Value Theory (EVT) (Danielsson et al., 2001; Embrechts et al., 1997). EVT is a statistical framework that focuses solely on extreme observations, offering a more accurate representation of tail behavior (Chakraborty et al., 2021; Diebold et al., 2000).

EVT was developed based on a generalized extreme value theorem that describes different kinds of parametrizations of probability distributions in a converged form as a general distribution function (Fisher & Tippett, 1928). Initially applied to natural disasters like floods and earthquakes (Gumbel, 1958), EVT also proves useful in financial risk settings (Rocco, 2014). In particular, Benito Muela et al. (2017) find that

EVT outperforms conventional VaR-based approaches in capturing in liquidity-related tail risk, particularly under stressed market conditions.

Embrechts (2000) emphasized EVT's ability to model skewness, fat tails, and rare stress scenarios. Because it extrapolates beyond observed data, EVT enables more informed decisions under uncertainty and represents an improvement over naïve curve-fitting. He concluded that, lacking such structured methods, decision-makers are liable to rely on far less reliable approaches. These insights lead to our first hypothesis:

**Hypothesis 1.** A quantitative risk measurement approach is positively associated with perceived preparation for extreme events amongst risk management professionals in the financial sector.

### **2.3. Risk Management and Organizational Resilience Theory**

In the aftermath of the financial crisis, several scholars and practitioners argued that extreme events cannot be reliably predicted and proposed alternative approaches to managing such risks (Bookstaber, 2017; Kay & King, 2020; Taleb et al., 2009). Within this debate, the management dimension highlights the practical and organizational capacity to orchestrate resources once disruption occurs. Crisis management research shows that crises are both events—highly salient shocks that threaten organizational viability—and processes that unfold over time through incubation, escalation, and resolution (Bundy et al., 2017).

Organizational Resilience Theory (ORT) extends this perspective by conceptualizing resilience as the ability of organizations to maintain functioning during disruption and to recover and adapt after adversity (Sutcliffe & Vogus, 2003; Williams et al., 2017).

Unlike crisis management research, which often focuses on decision-making under acute time pressure, ORT emphasizes the development of resources, routines, and tools

that allow organizations to absorb shocks and sustain performance throughout the crisis cycle (preparation, management during disruption, and recovery). Hillmann and Guenther (2021) clarify that these instrumental aspects include scenario planning, redundancy, and early warning systems for preparation; crisis communication, distributed decision-making, and coordination routines for managing disruption; and recovery protocols, organizational learning, and adaptation of routines for recovery. This instrumental focus distinguishes ORT from related perspectives that emphasize cultural or behavioral capacities such as improvisation, positive mindsets, or heedful attention. These capacities are also important but conceptually align more closely with the cultural and behavioral orientation captured by organizational mindfulness (Weick et al., 1999). Within this framework, the management modality therefore refers specifically to the adequacy of concrete tools and routines that allow organizations to prepare for, manage, and recover from extreme events.

If such tools are perceived as robust and fit for purpose, financial institutions are more likely to be seen as prepared to withstand and overcome extreme events (Williams et al., 2017). This reasoning leads to the following hypothesis:

**Hypothesis 2.** The perceived adequacy of tools for preparing for, managing, and recovering from extreme events is positively associated with perceived preparation for extreme events.

## **2.4. Risk avoidance and Normal Accident Theory**

Avoidance, as a modality of preparedness, reflects an orientation that seeks to eliminate, reduce, or circumvent organizational exposure to extreme events. This orientation is closely linked to Normal Accident Theory (NAT), introduced by Perrow (1981). Based on his analysis of the 1979 near nuclear meltdown at Three Mile Island, Perrow concluded that risk is inherent in technology and accidents will happen no matter what

organizations do, often in the absence of any human error. He defines a normal accident as an "unintended and untoward" event that "disrupts the ongoing or future output of the system" (Perrow, 1999, p. 65).

From this perspective, extreme events are not exceptional deviations, but the inevitable outcome of system design, which limits the effectiveness of strategies aimed at complete avoidance. According to Perrow, two factors render technological systems susceptible to normal accidents. The first is "complex interactions", which refer to "unfamiliar sequences, or unplanned and unexpected sequences" between systems components that are "either not visible or not immediately comprehensible" (Shrivastava et al., 2009, p. 1360). The second factor is "tight coupling" between components in the system, where the output of one is the input of the other, with little flexibility. Tight coupling leaves humans insufficient time or little possibility to intervene.

Efforts to enhance safety, such as adding new components or redundancies, can backfire if they increase system complexity or diffuse responsibility and reduce attentiveness (Tamuz & Harrison, 2006).

Perrow (2011b) proposes limiting the impact of normal accidents rather than eliminating them. He suggests that large organizations inherently carry concentrated risks yet acknowledges that modern society is unlikely to disaggregate them. Therefore, he emphasizes system design, advocating for modular structures, which limit the propagation of failures. At the societal level, he recommends reducing dependency on a small number of providers in sectors such as power supply, communications, and transportation (Perrow, 2009). Regulatory oversight plays a critical role, especially independent agencies with authority to conduct large-scale inspections and enforce corrective measures (Perrow, 2011b).

Although NAT was originally developed for industrial contexts, it has also been applied in the financial sector. Perrow (2011a) viewed the 2008 U.S. financial crisis as a systemic accident. Mezias (1994) analyzed the U.S. savings and loans crisis, linking exogenous shocks, regulatory complexity, and financial innovations to increased systemic opacity and tight coupling. Palmer and Maher (2010) examined the rapid collapse of Bear Stearns, showing how unpredictable internal dynamics revealed system complexity, while tight coupling left individuals powerless to halt cascading failures. More recently, Min and Borch (2022) applied NAT to algorithmic trading, citing Knight Capital's collapse on August 1, 2012, which occurred in just 45 minutes due to the unexpected activation of dormant code.

For organizational preparedness, the lesson from NAT is that when structures are perceived as complex and tightly coupled, strategies of avoidance are unlikely to be regarded as effective. Financial systems marked by global interdependence, automated processes, and rapid information flows, can fail in unpredictable and uncontrollable ways. Under such conditions, confidence in an organization's ability to prevent or contain disruption diminishes, leading to lower perceived preparedness. Building on this perspective, we arrive at the following hypothesis:

**Hypothesis 3.** Increased perceived complexity and tight coupling in the financial sector are associated with lower perceived preparedness for extreme events.

## **2.5. Organizational Mindfulness and High Reliability Theory**

Organizational mindfulness, conceptualized as a collective capacity to detect and respond effectively to unforeseen events (Weick et al., 1999), plays a central role in sustaining preparedness for extreme events. Beyond representing a state of heightened awareness, it entails a repertoire of organizational practices through which attention is directed, conserved, and translated into action. It originated in High Reliability Theory

(HRT), which examined organizations such as nuclear power plants, aircraft carriers, and air traffic control systems that maintained reliable performance despite operating in complex, hazardous environments (Rochlin et al., 1987; Weick, 1987; Roberts, 1990; Weick et al., 1999). These organizations achieved reliability through mechanisms such as decentralized decision-making, shared cognitive frameworks, redundancy, training, and continuous organizational support (Weick & Sutcliffe, 2001, 2007, 2015).

The applicability of this perspective to the financial sector was highlighted by Weick and Sutcliffe (2015), who analyzed the demise of Washington Mutual in 2008. They argued that adherence to principles of organizational mindfulness could have mitigated some of the failures that contributed to its collapse, thereby underscoring the relevance of HRT for financial institutions.

Building on this foundation, Weick et al. (1999) identified five interrelated dimensions of organizational mindfulness: preoccupation with failure, reluctance to simplify, sensitivity to operations, commitment to resilience, and deference to expertise. The first three support anticipation of extreme events, while the latter two enable containment once such events occur (Eastburn, 2018). Together, these dimensions provide the behavioral foundation through which organizations both anticipate and manage adversity, and are presented by Weick et al. (1999) as complementary aspects of a broader collective capacity.

Through these mechanisms, organizational mindfulness can shape how the three modalities of preparedness are enacted. With respect to measurement, reluctance to simplify implies a need for data-informed, context-sensitive approaches that are supported by structured analytical tools (Aven & Krohn, 2014; Hales & Chakravorty, 2016). Thus, mindfulness reinforces quantitative approaches to risk measurement by ensuring that anomalies and weak signals are noticed and analyzed rather than

overlooked. With respect to management, organizational mindfulness provides the cultural orientation through which tools and routines can be enacted effectively by embedding them in a culture of vigilance, adaptability, and distributed authority (Weick & Sutcliffe, 2001; Roberts et al., 1994). Finally, with respect to avoidance, mindfulness reduces the perception that complexity and tight coupling make preparedness impossible, by enabling organizations to monitor vulnerabilities more closely and to reframe systemic constraints as partially manageable (Weick & Sutcliffe, 2015). In this way, organizational mindfulness is not an outcome of preparedness but an antecedent of the three modalities that collectively determine preparedness for extreme events. It enhances measurement and management capacities while attenuating the negative effects of avoidance. Building on this reasoning, we propose the following hypotheses:

**Hypothesis 4.** Higher perceived application of organizational mindfulness is positively associated with higher perceived adoption of quantitative risk measurement approaches in the financial sector.

**Hypothesis 5.** Higher perceived application of organizational mindfulness is positively associated with higher perceived adequacy of management tools and practices in the financial sector.

**Hypothesis 6.** Higher perceived application of organizational mindfulness is negatively associated with higher perceived complexity and tight coupling in the financial sector.

**Hypothesis 7.** Higher perceived application of organizational mindfulness is positively associated with higher perceived preparedness for extreme events through its indirect effects on risk measurement, management, and avoidance.

In Figure 2, we show a hypothesized model of the principal research hypotheses.

### 3. METHOD

### **3.1. Questionnaire Design**

To test the empirical application of the theoretical frameworks for dealing with extreme events, a questionnaire was designed targeted at professionals in key support and control functions in the financial sector, including risk management, compliance, finance, control, technology and operations, legal, audit, and general management.

All questionnaire items were constructed based on the academic literature on the theoretical frameworks of Risk Measurement Approach, Crisis and Resilience Tools, Complex tight-coupled system, and Organizational Mindfulness and reflect organizational practices for measuring, managing, or avoiding extreme events.

The questionnaire was conducted in accordance with the ethical standards of the Academy of Management (1995). Accordingly, the questionnaire included a brief introduction explaining the purpose of the study, the voluntary nature of participation, and guarantees of anonymity. No personal identification information was collected. Organizational affiliation was optional and, when omitted, respondents were asked to provide alternative descriptors (size, type, and level of activity) to allow for segmentation.

The questionnaire was distributed during fall 2023 through Google Forms, enabling easy dissemination and data collection.

### **3.2. Research sampling**

Respondents were identified through professional and personal contacts of the first author, including LinkedIn connections and institutional affiliations within the financial sector. The sample included a broad range of 20 different Spanish banking institutions. Unlike earlier studies that limited their scope to top executives (Eastburn, 2018; Ray et al., 2011), this research addresses professionals at all organizational levels to minimize response bias.

A total of 1.524 people were contacted via e-mail or LinkedIn messages. Overall, 315 valid responses were received, representing a 20.7% response rate from direct contacts. All non-demographic items were mandatory, ensuring completeness of responses for all key variables.

Table 1 presents the demographic profile of respondents by organization type, function, tenure and firm size. Notably, 65% of respondents reported over 20 years of professional experience, which aligns with a broader demographic trend in banking, where a majority of professionals are over 45 years old (Randstad Research, 2023). Over 86% of respondents work at one of the top-3 banks in Spain (Santander, BBVA or Caixabank) with assets over 500 billion Euro. This aligns with the sectorial reality where these 3 banks account for 83% of total assets among the top 10 banking organizations.

*TABLE 1 Sample demographics*

| <b>Organization Type</b> |     | <b>Funcional Area Respondents</b> |     | <b>Management Level</b> |     |
|--------------------------|-----|-----------------------------------|-----|-------------------------|-----|
| Banking organization     | 93% | General Management                | 3%  | Director                | 20% |
| Consultancy firm         | 4%  | Global Risk Management            | 54% | Manager                 | 43% |
| Investment fund          | 1%  | Local Risk Management             | 11% | Analyst                 | 37% |
| Insurance firm           | 1%  | Technology & Operations           | 8%  |                         |     |
| Other sectors            | 2%  | Finance                           | 8%  |                         |     |
|                          |     | Internal Control                  | 4%  |                         |     |
|                          |     | Compliance                        | 2%  |                         |     |
|                          |     | Audit                             | 2%  |                         |     |
|                          |     | Legal                             | 2%  |                         |     |
|                          |     | Others                            | 6%  |                         |     |
| <b>Organization Size</b> |     | <b>Years of experience</b>        |     |                         |     |
| Over 500 Billion €       | 86% | < 5 years                         | 1%  | 5 - 10 years            | 3%  |
| 50-500 Billion €         | 2%  | 11 - 20 years                     | 31% | > 20 years              | 65% |
| 5-50 Billion €           | 1%  |                                   |     |                         |     |
| Less than 5 Billion €    | 2%  |                                   |     |                         |     |
| Unknown                  | 3%  |                                   |     |                         |     |
| Not a bank               | 7%  |                                   |     |                         |     |

### 3.3. Measures

Each construct was assessed using a set of items rated on 5-point Likert scales, as described in the subsections below. All items were translated into Spanish by the first author and back-translated by the second author to ensure accuracy in language and financial terminology.

### *Preparedness for Extreme Events*

This construct was measured by four items asking participants to evaluate their organization's preparedness for different kinds of extreme events: (1) a new financial crisis, (2) a cybersecurity related event, (3) a significant fine for financial crime or market abuse, and (4) a major technological disruption.

### *Risk Measurement Approach*

This construct was assessed using six items adapted from Embrechts (2017), Haldane & Nelson (2012), and Mikes (2011). Within this construct, we developed a first subconstruct on general quantitative risk measures. The three items in this subconstruct include: "In our organization a more quantified approach to risk assessment is advocated using proper measurement systems", "In my organization, risk models are considered essential tools for decision making", and "In our organization we are able to measure all risks consistently to be able to have the true map of our risk exposure".

Participants also evaluated a second subconstruct related to advanced modeling capabilities, which are those derived from EVT. The three items in this subconstruct were assessed with the following items: "The models we use in our organization capture risk in the tails of the distribution", "In my organization we analyze tipping points in our data to see if phenomena are occurring that can mark the beginning of very significant changes", and "We model economic and financial systems as complex, adaptive networks".

### *Crisis Management and Resilience Tools*

This construct, grounded in the instrumental dimension of Organizational Resilience Theory, was measured by three items adapted from Williams et al. (2017). Respondents evaluated whether their organization has adequate tools to (1) prepare for, (2) respond to a crisis or extreme event, and (3) recover once it occurs.

### *Complex and Tight-coupled Systems*

This construct measures the extent to which the financial sector is perceived as a complex, tightly-coupled system. Four items were adapted from Min & Borch (2022) and Shrivastava, et al. (2009). Sample items include: "I think there is great complexity in the processes within financial institutions that increase the risk of something going wrong" and "In my organization, when things start to go wrong, we have little margin to alter the chain of events".

### *Organizational Mindfulness*

This construct was assessed using ten items adapted from Ray et al. (2011). We developed a first subconstruct with seven items reflecting the dimensions of anticipation for extreme events (preoccupation with failure, reluctance to simplify, sensitivity to operations). A second subconstruct was developed with three items reflecting containment of extreme events (commitment to resilience, and deference to expertise). We followed Sutcliffe et al. (2016) in selecting a scale as a collective level construct (organizational mindfulness). Given that organizational mindfulness pervades the organization following a top-down approach (Vogus & Sutcliffe, 2012), this approach is deemed more useful in the context of a financial institution.

Some sample items include: "In my organization, people feel free to talk to their superiors about problems" (preoccupation with failure), "In my organization, we are encouraged not to take anything for granted" (reluctance to simplification), "The leaders of our organization pay close attention to the day-to-day operations of the company" (sensitivity to operations), "People in my organization generally learn from their mistakes" (commitment to resilience) and "If something out of the ordinary happens, people in my organization know who has the expert knowledge to respond" (deference to expertise).

All questionnaire items appear in Annex 1.

**3.4. Analyses**

Preliminary analyses included calculating descriptive statistics (means, standard deviations, skewness, and kurtosis) to assess distributional assumptions for all items (Satorra, 1990; Satorra and Bentler, 1990) and performing Harman one-factor tests to assess potential common method variance (Podsakoff et al., 2003). Structural equation modeling was selected because it enables the estimation of relationships among latent constructs measured through multiple observed indicators, facilitating the empirical testing of theoretically grounded models based on survey data (see, for instance, Solakis et al., 2022). The data were analyzed using the lavaan package in R (Rosseel, 2012). To estimate and test the conceptual model we used the two-step method by first assessing the measurement model and then the structural model.

To validate the measurement model and examine the structure of the five constructs and for two subconstructs, we performed a confirmatory factor analysis evaluating internal reliability and convergent and discriminant validity. The criteria used were Cronbach's alpha >0.7 (Cheung et al. 2023), indicator loadings >0.5 and nested models that confirm the goodness of the model with seven constructs (Becker et al., 2012; Hair et al., 2023). Finally, hypotheses were tested using robust maximum likelihood (RML) parameter estimation, model fit indices, the same interpretation criteria as in the CFA, and by evaluating the statistical significance of regression paths.

**4. RESULTS**

**4.1 Preliminary analyses**

Mean, standard deviation, skewness, kurtosis and correlations are shown in Table 2.

TABLE 2 Descriptive statistics

| Construct | M | SD | Skew | Kurt | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------|---|----|------|------|---|---|---|---|---|---|
|-----------|---|----|------|------|---|---|---|---|---|---|

|                                         |      |      |      |      |        |        |        |        |        |        |
|-----------------------------------------|------|------|------|------|--------|--------|--------|--------|--------|--------|
| 1. General quantitative risk measures   | 4.18 | 0.66 | 0.76 | 0.76 |        |        |        |        |        |        |
| 2. Advanced risk modelling capabilities | 3.77 | 0.75 | 0.78 | 0.78 | 0.66** |        |        |        |        |        |
| 3. Anticipation of extreme events       | 3.81 | 0.66 | 0.86 | 0.85 | 0.57** | 0.53** |        |        |        |        |
| 4. Containment of extreme events        | 3.69 | 0.70 | 0.75 | 0.74 | 0.47** | 0.41** | 0.77** |        |        |        |
| 5. Complex and tight coupled systems    | 3.30 | 0.77 | 0.75 | 0.75 | 0.25** | 0.19** | -0.2** | -0.1+  |        |        |
| 6. Preparedness for extreme events      | 3.95 | 0.62 | 0.76 | 0.76 | 0.49** | 0.42** | 0.4**  | 0.3**  | 0.25** |        |
| 7. Crisis Mgmt and Resilience Tools     | 3.79 | 0.64 | 0.77 | 0.74 | 0.5**  | 0.45** | 0.44** | 0.34** | 0.26** | 0.51** |

+ p < .10 \* p < .05 \*\* p < .01 \*\*\* p < .001

The Harman single-factor test applied on all variables indicates that the variance explained by the first factor is 29%, indicating that common method bias is unlikely to be a serious concern.

## 4.2 Structural equation modelling

### 4.2.1 Measurement model

The measurement model produced good fit ( $\chi^2 = 470$ ,  $df = 303$ ,  $p < .001$ ;  $\chi^2/df=1.55$ ; RMSEA = .045; CFI = .940; TLI = .931; NNFI = .931; SRMR = .052). Indicator loadings of 0.5 or higher confirm that the variance between a construct and its indicators surpasses measurement error, establishing measurement model reliability. As shown in Table 3, all variable indicator loadings exceeded 0.5. Reliability metrics, including Cronbach's alpha also met acceptable thresholds.

TABLE 3. Indicator loadings of the research variables.

| Construct                              | Subscale                             | Item | Standardized factor loading | Corrected Item-scale correlations | Cronbach alpha |
|----------------------------------------|--------------------------------------|------|-----------------------------|-----------------------------------|----------------|
| Risk Measurement Approach              | General quantitative risk measures   | EVT1 | 0.71                        | 0.61                              | 0.76           |
|                                        |                                      | EVT2 | 0.69                        | 0.58                              |                |
|                                        |                                      | EVT3 | 0.74                        | 0.57                              |                |
|                                        | Advanced risk modelling capabilities | EVT4 | 0.72                        | 0.60                              | 0.78           |
|                                        |                                      | EVT5 | 0.78                        | 0.64                              |                |
|                                        |                                      | EVT6 | 0.71                        | 0.61                              |                |
| Complex and tight coupled systems      |                                      | NAT1 | 0.62                        | 0.51                              | 0.75           |
|                                        |                                      | NAT2 | 0.73                        | 0.60                              |                |
|                                        |                                      | NAT3 | 0.60                        | 0.51                              |                |
|                                        |                                      | NAT4 | 0.65                        | 0.54                              |                |
| Crisis Management and Resilience Tools |                                      | ORT1 | 0.61                        | 0.48                              | 0.74           |
|                                        |                                      | ORT2 | 0.87                        | 0.71                              |                |

|                                 |                                |       |      |      |      |
|---------------------------------|--------------------------------|-------|------|------|------|
|                                 |                                | ORT3  | 0.69 | 0.52 |      |
| Organizational Mindfulness      | Anticipation of extreme events | HRT1  | 0.74 | 0.68 | 0.85 |
|                                 |                                | HRT2  | 0.72 | 0.65 |      |
|                                 |                                | HRT3  | 0.70 | 0.63 |      |
|                                 |                                | HRT4  | 0.75 | 0.68 |      |
|                                 |                                | HRT5  | 0.65 | 0.60 |      |
|                                 |                                | HRT6  | 0.62 | 0.57 |      |
|                                 |                                | HRT7  | 0.58 | 0.52 |      |
|                                 | Containment of extreme events  | HRT8  | 0.66 | 0.48 | 0.74 |
|                                 |                                | HRT9  | 0.72 | 0.64 |      |
|                                 |                                | HRT10 | 0.73 | 0.61 |      |
| Preparedness for extreme events |                                | PRP1  | 0.68 | 0.55 | 0.76 |
|                                 |                                | PRP2  | 0.69 | 0.58 |      |
|                                 |                                | PRP3  | 0.64 | 0.54 |      |
|                                 |                                | PRP4  | 0.66 | 0.57 |      |

All factor loadings and correlations are significant ( $p < .01$ )

Based on correlations in Table 2, three confirmatory factor analyses (CFA) were conducted to determine the distinctiveness of the constructs HRT, EVT, ORT, NAT, and PRP. We compared the hypothesized five-construct measurement model loading on different factors with several alternative nested models in which several factors were set to load on a single factor. The seven-factor model, where both EVT and HRT are separated into 2 subconstructs, significantly fitted data better than the alternative models, supporting the discriminant validity (Table 4).

*TABLE 4 Goodness of fit statistics of confirmatory factor analyses*

|                | X2    | df  | X2/ df | RMSEA  | CFI   | TLI   | NNFI  | SRMR   |
|----------------|-------|-----|--------|--------|-------|-------|-------|--------|
| 1 Factor Model | 1,422 | 324 | 4.390  | 0.101  | 0.679 | 0.652 | 0.652 | 0.093  |
| 5-factor Model | 510   | 314 | 1.625  | 0.048  | 0.929 | 0.921 | 0.921 | 0.053  |
| diff 1 vs 5    | -912  | -10 |        | -0.053 | 0.251 | 0.269 | 0.269 | -0.040 |
| 7-factor Model | 470   | 303 | 1.553  | 0.045  | 0.940 | 0.931 | 0.931 | 0.052  |
| diff 5 vs 7    | -40   | -11 |        | -0.003 | 0.011 | 0.010 | 0.010 | -0.001 |

All p-values < 0.001

#### 4.2.2 Structural model

To test the research hypotheses, a structural equation model was estimated in line with figure 2. As the subscales for the Risk Measurement Approach (general quantitative risk measures and advanced risk modeling capabilities) and for Organizational Mindfulness

(anticipation and containment of extreme events) do not reach statistical significance with the dependent variables, these subscales are loaded in a second order model (Koufteros et al., 2009). This model reaches an acceptable model fit ( $\chi^2 = 515$ ,  $df = 314$ ,  $p < .001$ ; RMSEA = .049; CFI = .928; TLI = .920; NNFI = .920; SRMR = .065). Estimates are shown in Table 5.

TABLE 5 Standardized Direct and Indirect Effects

| Hypothesis       |    |                 | Standardized regression coefficient | Non-standardized regression coefficient |
|------------------|----|-----------------|-------------------------------------|-----------------------------------------|
| Direct Effects   | H1 | EVT → PRP       | 0.44 ***                            | 0.35                                    |
|                  | H2 | ORT → PRP       | 0.32 ***                            | 0.29                                    |
|                  | H3 | NAT → PRP       | -0.13 +                             | -0.09                                   |
|                  | H4 | HRT → EVT       | 0.74 ***                            | 0.57                                    |
|                  | H5 | HRT → ORT       | 0.53 ***                            | 0.37                                    |
|                  | H6 | HRT → NAT       | -0.28 ***                           | -0.25                                   |
| Indirect Effects |    | HRT → EVT → PRP | 0.32 ***                            | 0.20                                    |
|                  |    | HRT → ORT → PRP | 0.17 ***                            | 0.11                                    |
|                  |    | HRT → NAT → PRP | 0.04 +                              | 0.02                                    |
|                  | H7 | HRT - - -> PRP  | 0.53 ***                            | 0.33                                    |

+  $p < .10$  \*  $p < .05$  \*\*  $p < .01$  \*\*\*  $p < .001$

Both Risk Measurement (EVT) and Risk Management (ORT) were significantly and positively associated with perceived preparedness for extreme events, while Risk Avoidance (NAT) showed a negative but only marginal effect. Organizational mindfulness (HRT) exerted strong positive effects on measurement and management, and a significant negative effect on avoidance. Indirect effects on perceived preparedness were significant through measurement and management, while the pathway through avoidance was marginal. The total indirect effect of organizational mindfulness on perceived preparedness was positive and highly significant. All of the before-mentioned findings support our research hypotheses 1 to 7.

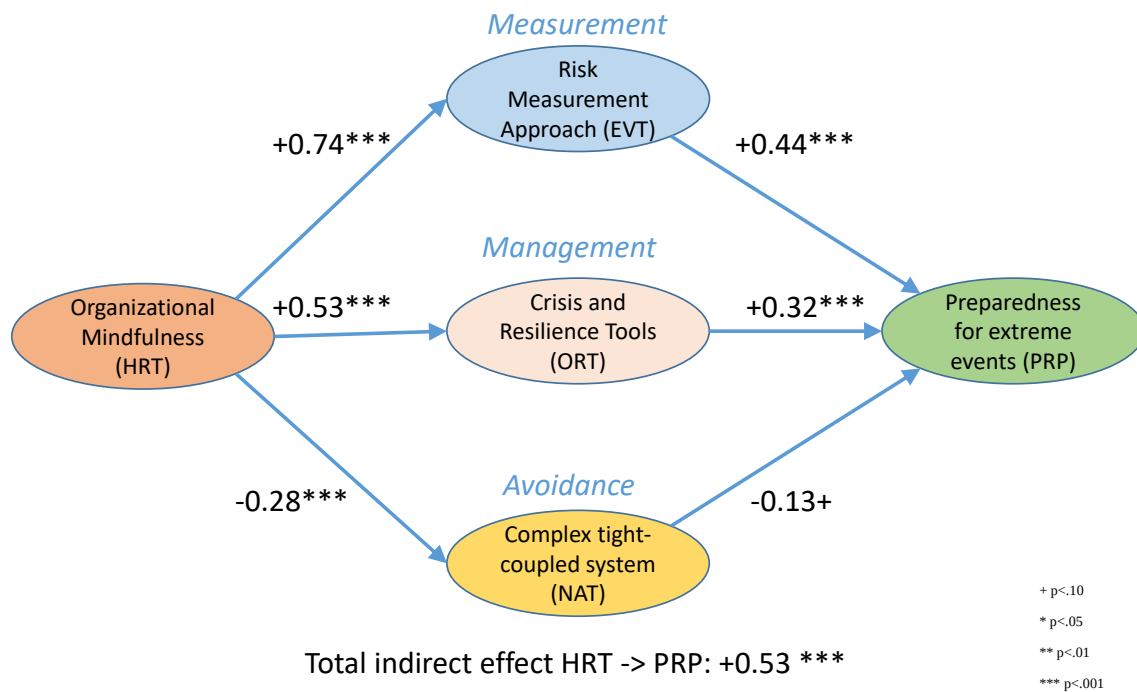


FIGURE 3 Paths between variables and standardized parameters

## 5 DISCUSSION AND CONCLUSIONS

### 5.1 Summary of main results

This study examined organizational preparedness for extreme events in the financial sector through three modalities of orientation towards risk: measurement, management, and avoidance and examined the cross-cutting role of organizational mindfulness.

Using survey data from Spanish financial professionals and structural equation modeling, the analysis tested seven hypotheses. Results show that quantitative risk measurement approaches and crisis management and resilience practices are positively associated with perceived preparedness, whereas the structural constraints of complex and tightly coupled systems are negatively, albeit only marginally, associated.

Organizational mindfulness contributes to perceived preparedness by fostering a cultural orientation that strengthens risk measurement and management while mitigating

the inherent limitations of avoidance strategies. Together, these findings indicate organizational preparedness as a multidimensional challenge involving analytical capabilities (EVT), tools for crisis management and resilience (ORT), structural constraints (NAT), and a culture of attentiveness (HRT).

## **5.2 Theoretical implications**

### *Risk Measurement (EVT)*

The positive association between quantitative risk measurement and perceived preparedness (H1) confirms the continued relevance of robust statistical approaches for risk assessment, communication, and capital allocation in the financial sector.

Although Gaussian-based distributions remain central in regulatory capital models, our findings indicate that practitioners perceive that more robust approaches incorporating tail risks are positively associated with higher preparedness for extreme events in the financial sector. The usefulness of risk models depends not only on their technical sophistication but also on how they are understood. Both Kay and King (2020) and Mikes (2011) stress credibility and interpretability of risk models.

### *Risk management (ORT)*

Results supporting H2 demonstrate that preparedness for extreme events also depends on the adequacy of routines and tools that allow organizations to prepare for, manage, and recover from crises, as highlighted in Organizational Resilience Theory. These instrumental mechanisms, such as scenario planning, communication systems, recovery protocols, and coordination routines, provide concrete means of sustaining performance across the crisis lifecycle. In this way, the management modality captures the extent to which financial institutions perceive themselves as equipped with sufficient tools to face disruption.

### *Risk Avoidance (NAT)*

Consistent with Normal Accident Theory, higher perceptions of complexity and tight coupling were associated with lower perceived preparedness (H3), although the relationship was only marginally significant ( $p < .10$ ). This suggests that unexpected interactions in tightly coupled systems can undermine safeguards and reduce confidence in readiness. However, the finding also refines NAT's assumptions by indicating that, in traditional retail and commercial banking, time-critical failure propagation may be less dominant than in algorithmic trading, where cascading failures can unfold within minutes (Min & Borch, 2022). The relatively low mean score (2.75/5) for limited maneuverability supports this nuance.

#### *Organizational mindfulness (HRT)*

Organizational mindfulness was found to be positively associated with perceived adequacy of risk measurement and management, and negatively associated with perceived vulnerability arising from complexity and tight coupling (H4–H6). Through these pathways, the total indirect effect on perceived preparedness was strong and significant (H7). These findings position organizational mindfulness as a cultural orientation of attentiveness that shapes how professionals perceive the organization's ability to notice weak signals, remain vigilant in daily operations, and sustain awareness of potential disruptions. In contrast to ORT's emphasis on instrumental tools and routines, OM captures the behavioral and cultural dimension of preparedness as perceived by financial sector professionals.

#### *Integrative implications*

Taken together, these findings demonstrate that preparedness for extreme events in the financial sector is best understood as a multidimensional construct. Measurement, management, avoidance, and organizational mindfulness each contribute distinct but complementary perspectives that together shape perceptions of readiness. By integrating

frameworks from risk modeling, crisis management and resilience research, normal accident theory and organizational mindfulness, this study provides a comprehensive approach to organizational preparedness that has not previously been tested empirically in this sector. The survey encompassed professionals from across organizational levels, reflecting a broad range of perspectives on preparedness. Importantly, unlike retrospective studies of past crises, this analysis adopts a prospective orientation: Rather than explaining failures after they have occurred, it captures how preparedness is currently perceived. This shift underscores the value of perceptions as a forward-looking basis for understanding organizational preparedness in contexts marked by uncertainty and extreme risk.

### **5.3 Practical Implications for risk management and policy**

The positive association between quantitative risk measurement and perceived preparedness (H1) underscores the value of approaches that incorporate tail risk. For practitioners, this highlights the importance of risk modelling beyond Gaussian assumptions, and use of stress tests or scenario planning. Managers should ensure that the modeling assumptions and limitations are clearly communicated across hierarchical levels. Regulators can reinforce this by encouraging methodologies that capture extreme events while remaining transparent and interpretable to users.

Perceptions that preparedness increases with the adequacy of crisis management and resilience tools and routines (H2) suggest that institutions should regularly test and update crisis management plans, recovery protocols, and communication systems.

Respondents across organizational levels viewed these tools as central to preparedness, indicating that formal oversight mechanisms alone are insufficient without credible and practiced routines. Given that financial crises and cyberattacks were seen as the most plausible threats, institutions should consider targeted scenario exercises or simulations,

similar to fire drills, to enhance agility and preparedness in responding to these high-priority risks.

Regulators can support this by placing more emphasis on the application in practice of these tools, not only on the existence of formal plans.

The finding that complexity and tight coupling are perceived to reduce preparedness (H3), albeit marginally, reflects concerns that systemic interdependencies can constrain the effectiveness of avoidance strategies. For managers, this implies that organizational design should limit critical bottlenecks, strengthen modularity, and clarify responsibilities to slow the propagation of failures. Survey respondents broadly agreed on the importance of regulation, consistent with NAT's emphasis on oversight in tightly coupled systems.

An additional observation from the survey data suggests that respondents from larger banks tended to perceive their organizations as more vulnerable to extreme events, aligning with NAT's concern that organizational size can amplify systemic exposure. This perception contrasts with the post-crisis trend of banking consolidation, which, according to Eichengreen (2023), has been driven by technological and regulatory cost pressures.

From a policy perspective, the results highlight continuing support for strong regulatory oversight, stress-testing systemic risks, and addressing concentration and consolidation trends that may amplify vulnerability.

Post-crisis governance reforms led to improvements in formal risk oversight. At the international level, the Basel Committee's Corporate Governance Principles (BIS, 2015) established the three lines of defense model, while in Europe, the Capital Requirements Directive (2013/36/EU) introduced more robust governance frameworks. However, while these frameworks emphasize structures and processes, the findings of this study

suggest they should be complemented by a culture and practices of organizational mindfulness that promote attentiveness to the anticipation and containment of extreme events.

These cultural practices enhance the effectiveness of measurement and management while counteracting the fatalism associated with NAT. Anticipation involves early detection of risk signals, openness to diverse perspectives, and strong analytical thinking. While respondents valued these practices, low emphasis on preoccupation with failure highlights the need for cultural change to reduce complacency.

Containment to respond effectively once an extreme event occurs is driven by resilience, cross-functional collaboration, and informal knowledge exchange. Although informal networks were generally seen as beneficial, concerns were raised regarding exclusivity stifling dissent. In this context, more inclusive and adaptive networks, as theorized by Weick et al. (1999), appear especially relevant to enhance organizational flexibility. Furthermore, while deferring to expertise was highly valued, it was perceived as underused in practice, pointing to the need for flatter structures and greater internal transparency.

#### **5.4 Limitations and directions for further research**

This study has several limitations. First, the use of professional networks for data collection may introduce sample bias. However, this approach ensured access to respondents with direct responsibility for risk management and preparation within financial institutions. Second, the use of self-reported data may raise concerns about social desirability bias even though anonymity was maintained. On the other hand, statistical testing suggested that common method variance was unlikely to have materially affected the findings. Third, as a cross-sectional study, the survey captures

perceptions at a single moment in time, limiting the ability to assess how preparedness evolves in response to changing conditions.

Future research could examine how these frameworks are operationalized in practice, identifying barriers to implementation and the conditions that facilitate organizational uptake. Longitudinal studies could provide further insight into how perceptions of preparedness change over time.

In addition, complementary perspectives, such as socio-cultural approaches to risk (Gephart et al., 2009), may yield further insights into how institutions construct meaning around extreme events and govern uncertainty in more diverse contexts.

## **5.5 Conclusion**

Taken together, the findings of this study indicate that preparedness for extreme events is best understood as a multidimensional construct. Measurement (EVT) contributes analytical capabilities for capturing tail risk; management (ORT) highlights the sufficiency of tools and routines for preparation, response, and recovery; avoidance (NAT) underscores the structural limits of complex, tightly coupled systems; and organizational mindfulness (HRT) functions as a cultural orientation that strengthens measurement and management while mitigating the constraints of avoidance. By integrating these perspectives, the study advances a richer understanding of how financial sector professionals evaluate their organizations' ability to address extreme events. Viewing these evaluations as central to organizational orientation toward risk emphasizes that the way threats are perceived today shapes how institutions position themselves for uncertainty and prepares the ground for more adaptive responses when future extreme events occur.

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## Appendices:

### I: List of questionnaire items

| Coding                     | Question in Spanish                                                                                                                                                      | Question (English Translation)                                                                                                                     | Source                                               |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|
| Preparedness               | En qué medida piensa que su organización está preparada para resistir alguno de los siguientes eventos extremos                                                          | To what extent do you think your organization is prepared to withstand any of the following extreme events?                                        |                                                      |
| EXTPRP2                    | Una nueva crisis financiera                                                                                                                                              | A new financial crisis                                                                                                                             |                                                      |
| EXTPRP3                    | Un evento asociado a la seguridad informática o ciberseguridad                                                                                                           | An event associated with computer security or cybersecurity                                                                                        |                                                      |
| EXTPRP4                    | La imposición de una sanción muy significativa por condena por un delito financiero o abuso de mercado                                                                   | A very significant fine for financial crime or market abuse                                                                                        |                                                      |
| EXTPRP5                    | Una pérdida muy significativa debido a una disrupción tecnológica                                                                                                        | A very significant loss due to technological disruption                                                                                            |                                                      |
| Measurement                | La capacidad del banco para modelizar la ocurrencia de un evento extremo                                                                                                 | The bank's ability to model the occurrence of an extreme event                                                                                     |                                                      |
| EVT0.1APL                  | En mi organización se fomenta activamente la valoración cuantitativa de los riesgos usando los sistemas de medición adecuados                                            | In our organization a more quantified approach to risk assessment is advocated using proper measurement systems                                    | Mikes, A. (2011)                                     |
| EVT0.2APL                  | En mi organización los modelos de riesgos se consideran herramientas indispensables para la toma de decisiones                                                           | In my organization, risk models are considered essential tools for decision making                                                                 | Mikes, A. (2011)                                     |
| EVT0.3APL                  | En mi organización existe la capacidad de medir todos los riesgos de manera consistente para obtener un mapa real de nuestra exposición a los riesgos                    | In our organization we are able to measure all risks consistently to be able to have the true map of our risk exposure                             | Mikes, A. (2011)                                     |
| EVT1.3APL                  | Los modelos que usamos en nuestra organización recogen el riesgo en las colas de la distribución                                                                         | The models we use in our organization capture risk in the tails of the distribution                                                                | Mikes, A. (2011)                                     |
| EVT3.3APL                  | En mi organización analizamos puntos de inflexión en los datos para ver si están ocurriendo fenómenos que pueden marcar el inicio de cambios muy significativos          | In my organization we analyze tipping points in our data to see if phenomena are occurring that can mark the beginning of very significant changes | Haldane, A. G., & Nelson, B. (2012).                 |
| EVT3.5APL                  | En mi organización modelizamos los sistemas económicos y financieros como redes complejas y adaptativas                                                                  | We model economic and financial systems as complex, adaptive networks                                                                              | Haldane, A. G., & Nelson, B. (2012).                 |
| Management                 | Las herramientas con las que contamos son suficientes para poder:                                                                                                        | The tools we have are sufficient to be able to:                                                                                                    |                                                      |
| EXTHER2                    | Prepararnos de forma anticipada por si ocurre                                                                                                                            | Prepare in advance in case it happens                                                                                                              | Williams et al. (2017)                               |
| EXTHER3                    | Realizar una buena gestión de la crisis o evento extremo una vez que ocurra                                                                                              | Carry out good management of the crisis or extreme event                                                                                           | Williams et al. (2017)                               |
| EXTHER4                    | Recuperarnos una vez ha ocurrido                                                                                                                                         | Recover once it has happened                                                                                                                       | Williams et al. (2017)                               |
| Avoidance                  | El grado de complejidad y de integración estrecha de las operaciones del banco                                                                                           | The degree of complexity and tight coupling of the bank's operations                                                                               |                                                      |
| NAT1.4APL                  | En mi organización puede ocurrir una sucesión de giros inesperados de acontecimientos que ni siquiera una persona con conocimientos íntimos de la situación puede prever | A series of unexpected turns of events can occur in my organization that not even a person with intimate knowledge of the situation can foresee    | Min, B. H., & Borch, C. (2022).                      |
| NAT1.2APL                  | Pienso que existe gran complejidad de los procesos en las entidades financieras que incrementan el riesgo que algo vaya mal                                              | I think there is great complexity in the processes within financial institutions that increase the risk of something going wrong                   | Shrivastava, S., Sonpar, K., & Pazzaglia, F. (2009). |
| NAT2.4APL                  | En mi organización cuando las cosas empiezan a ir mal, tenemos poco margen de maniobra para alterar la cadena de eventos                                                 | In my organization, when things start to go wrong, we have little margin to alter the chain of events                                              | Min, B. H., & Borch, C. (2022).                      |
| NAT2.6APL                  | Pienso que en las entidades financieras existen muchas interdependencias que provocan que errores en una parte puedan extenderse a todo el sistema                       | I think that in financial sector entities there are many interdependencies that may lead to errors in one part extending to the entire system      | Min, B. H., & Borch, C. (2022).                      |
| Organizational Mindfulness | La capacidad organizativa del banco para anticipar un evento extremo                                                                                                     | The bank's organizational capacity to anticipate an extreme event                                                                                  |                                                      |
| HRTANT_5_APL               | En mi organización las personas se sienten libres de hablar con sus superiores jerárquicos sobre problemas                                                               | In my organization, people feel free to talk to their superiors about problems                                                                     | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTANT_6_1APL              | En mi organización se anima a no tomar nada por sentado                                                                                                                  | In my organization, people are encouraged not to take anything for granted                                                                         | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTANT_6_5APL              | Las personas de mi organización generalmente profundizan su análisis para comprender la naturaleza de los problemas que surgen                                           | People in my organization generally prolong their analysis to understand the nature of the problems that come up                                   | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTANT_6_7APL              | Las personas en mi organización escuchan atentamente; es raro que se descarte la opinión de alguien                                                                      | People in my organization listen carefully; it is rare that anyone's view is dismissed                                                             | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTANT_7_1APL              | Los líderes de nuestra organización prestan mucha atención a las operaciones diarias de la empresa                                                                       | The leaders of our organization pay close attention to the day-to-day operations of the company                                                    | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTANT_7_4_APL             | Durante un día normal, las personas entran en contacto suficiente entre sí para formarse una imagen clara de la situación actual                                         | During an average day, people come into enough contact with each other to build a clear picture of the current situation                           | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTANT_7_8APL              | Si surgen sorpresas inesperadas en mi organización tenemos acceso a recursos                                                                                             | If unexpected surprises arise in my organization, we have access to resources                                                                      | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
|                            | La capacidad organizativa del banco para reaccionar ante un evento extremo                                                                                               | The bank's organizational capacity to react to an extreme event                                                                                    |                                                      |
| HRTCON_8_9APL              | Las personas en mi organización en general aprenden de sus errores                                                                                                       | People in my organization generally learn from their mistakes                                                                                      | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTCON_9_3APL              | Si sucede algo fuera de lo común, las personas en mi organización saben quién tiene el conocimiento experto para responder                                               | If something out of the ordinary happens, people in my organization know who has the expertise to respond                                          | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |
| HRTCON_9_8APL              | Por lo general, es fácil obtener asistencia de expertos en mi organización cuando surge algo que no sabemos cómo manejar                                                 | It is generally easy to obtain assistance from experts in my organization when something comes up that we don't know how to handle                 | Ray, J. L., Baker, L. T., & Flowman, D. A. (2011)    |