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# The effects of a firm's internationalization, age, and environmental turbulence on the capabilities that comprise strategic agility

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**Abstract**
This study investigates a largely unexplored area by examining how internationalization, firm age, and environmental turbulence influence the key components of strategic agility, namely strategic sensitivity, leadership unity, and resource fluidity. Although these factors have been identified as potential catalysts for strategic agility, their specific impacts on strategic agility's core capabilities have yet to be thoroughly explored. Our research aims to bridge this gap, providing a nuanced understanding of how each of these variables shapes the strategic agility of a firm. The study uses the empirical research of 220 Spanish firms in the service sector and then adopts partial least squares structural equation modeling to analyze the data. Our findings indicate that internationalization has a dual effect on strategic agility: internationalization enhances strategic sensitivity, reflecting improved environmental awareness, but it diminishes leadership unity, illustrating the complexities of global leadership alignment. Additionally, an increase in firm age is associated with a decrease in all the aspects of strategic agility. By contrast, environmental turbulence positively impacts each dimension of strategic agility, suggesting that turbulent conditions can indeed promote the adaptability and responsiveness of a firm.

**Keywords** Strategic agility · Internationalization · Strategic sensitivity · Leadership unity · Resource fluidity

**JEL Classification** L20 · L22 · L29

## Introduction

The recent literature consistently highlights the growing complexity confronting firms in ever-changing environments, and this phenomenon is increasingly evident in the fluctuating nature of global markets (Clauss et al., 2021b; Debellis et al., 2021). This evolving dynamism presents challenges of unprecedented breadth and

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scale, potentially rendering the ineffectiveness of traditional business models for market adaptation (Tarba et al., 2023). Significantly, the complexities associated with international business operations have intensified (Fernhaber & Zou, 2022), which stem from the array of varied environments that firms encounter. Van Tulder et al. (2020) have underscored the growing multipolarity of the global landscape, emphasizing that drastic and unforeseen changes are the sole constants in today's world. Firms, particularly multinational enterprises, are consequently compelled to develop adaptive and creative responses to maintain competitiveness, thereby bringing the concept of strategic agility to the forefront (Tarba et al., 2023).

The concept of strategic agility is garnering increasing attention from academics and practitioners (de Diego & Almodóvar, 2022). Despite its growing prominence, the field lacks a uniform definition, which reflects the diverse perspectives and approaches in existing studies. However, consensus around its composition has emerged, which is generally believed to encompass three core capabilities (Clauss et al., 2021b; Doz & Kosonen, 2010; Hock et al., 2016), namely (a) strategic sensitivity, or the active sensing and anticipation of changes in the environment; (b) leadership unity, or the ability of a firm's leadership team to make bold, fast decisions; and (c) resource fluidity, or the internal capability to quickly reallocate resources as needed.

Notwithstanding the increasing number of papers studying strategic agility (de Diego & Almodóvar, 2022), the precise factors that relate positively or negatively to strategic agility remain poorly understood. De Diego et al.'s (2022) study offered insights into the multifactorial nature of strategic agility. However, much of the existing research tends to examine the effects of individual variables, such as environmental turbulence and firm age (Anggraini & Sudhartio, 2019; Reed, 2021). This suggests a significant gap in the literature regarding the collective impact of various factors on strategic agility.

This study contributes to the existing body of knowledge by comprehensively examining three key variables—firm internationalization, firm age, and environmental turbulence—and their impact on the components of strategic agility. This multifaceted approach represents a shift away from previous research not only by concurrently investigating these variables but also by analyzing their influence on each dimension of strategic agility (i.e., strategic sensitivity, leadership unity, and resource fluidity). To our knowledge, this work is the inaugural study to construct a theoretical and empirical framework analyzing how this trio of variables affects the different aspects of strategic agility. More concretely, we first explore the role of internationalization in fostering strategic agility, positing that firms engaged in international markets must possess the flexibility to swiftly adapt to the dynamic and diverse challenges presented by such environments (Weber & Tarba, 2014). We then examine the influence of a firm's age on its strategic agility, drawing upon the association between youth and entrepreneurial dynamism, suggesting that younger firms may exhibit a stronger orientation toward proactive and rapid decision-making (Fernhaber & Zou, 2022; Reed, 2020, 2021). Finally, we focus on environmental turbulence, which is traditionally considered a moderating factor (Adomako et al., 2022; Ahammad et al., 2021; Clauss et al., 2021a; Reed, 2020, 2021), and propose its direct impact on strategic agility, thereby extending the discourse beyond its relationship with firm performance to its fundamental effect on agility itself. Thus, the

current research extends beyond the existing literature by hypothesizing the effect of these three variables on the distinct capabilities constituting strategic agility. However, our research does not imply that these factors are the only ones affecting strategic agility; rather, they represent a significant starting point for what is envisioned to be an expanding line of inquiry into the complex dynamics of strategic agility.

To accomplish the objective of this research, the study is supported by a survey of 220 Spanish firms in the service sector and uses structural equation modelling (SEM) to identify the role of our triad of variables in the three different capabilities that constitute strategic agility. This approach allows us to offer valuable insights that are pertinent to both academics and practitioners, underscoring the practical implications of our findings in the realms of strategic management and international business.

The rest of the paper is structured into several sections. The second section focuses on the theoretical underpinnings of strategic agility and outlines the different hypotheses. In the third section, we explain the methodology of analysis and data collection. The fourth section presents the results of the research and the discussion of these results. Finally, in the fifth section, we provide the conclusions, limitations, and future lines of research.

## Theoretical background

### Strategic agility

Strategic agility remains a topic that has not reached maturity, and several authors have defined or used the topic differently (de Diego & Almodóvar, 2022). Scholars have approached strategic agility from various angles. For instance, Ekman and Angwin (2007) highlighted the role of strategic agility in navigating complexity and turbulence, whereas Lewis et al. (2014) and Weber and Tarba (2014) emphasized flexibility and responsiveness in changing environments. Denning (2018) viewed strategic agility as a driver for market innovation, and Clauss et al. (2021b) described it as a balance between continuous renewal and efficiency. Aligning with de Diego and Almodóvar (2022, p. 230), we define strategic agility as a meta-capability that enables organizations to anticipate, react, and seize rapid environmental changes by redefining strategies for survival and value creation. This broader perspective encapsulates strategic agility as a dynamic, multi-dimensional construct, which is essential in the current unpredictable business landscape. Despite the diversity in definitions, the consensus is that strategic agility requires a combination of three capabilities (Clauss et al., 2021a; Doz & Kosonen, 2010), namely strategic sensitivity, leadership unity, and resource fluidity.

Strategic sensitivity is the first capability, which refers to the manner by which firms anticipate and adapt to changes in the environment. Firms that exhibit strategic sensitivity exert efforts to be aware of external changes, such as competitor moves, shifts in customer desires, and the availability of new technologies. In that sense, firms dedicate time and resources to listening to their clients (e.g., through surveys), conducting market studies, or assessing competitors (e.g., where they are making investments, what seem to be their areas

of interest, what recent strategic moves they have made) (Doz & Kosonen, 2008a; Mavengere, 2013). Insights discovered (e.g., on customers, competitors, and technologies) are then rapidly communicated so that relevant management layers can act upon the information.

The second capability, originally coined as leadership unity but also referred to as "collective commitment" (Ivory & Brooks, 2018), is about top executives dialoguing and integrating and aligning their interests. Leadership unity specifically "*hinges on the ability of members of the top team to understand and trust each other*" (Doz & Kosonen, 2010, p. 376). This capability is important as organizations with a high level of leadership unity (or collective commitment) encounter minimal organizational resistance (Brueller et al., 2014) and make fast and bold strategic decisions (Doz & Kosonen, 2008a). Firms that excel at leadership unity have top management collaborating and solving challenges without meddling in "win–lose" politics (Arbussa et al., 2017).

Finally, the third capability, resource fluidity, pertains to the rapid redeployment of resources and reconfiguration of business systems (Doz & Kosonen, 2008b). This organizational and coordinative capability (Junni et al., 2015) is particularly important as most firms suffer from resource rigidity (Gilbert, 2005). One explanation for this phenomenon is that a large number of organizations were built in an age of stability, not of changing interdependencies and evolving, volatile environments (Birkinshaw et al., 2008; Hamel, 2007). Resource fluidity denotes the capacity of a firm to shift resources in real time rather than executing a pre-determined plan, and this capability is enabled by an adaptive learning strategy-making perspective (Doz, 2020). Firms that excel at resource fluidity are capable of swiftly reallocating resources such as capital, people, and competencies.

Strategic agility is defined by three distinct capabilities; thus, each capability may be influenced differently by various external forces. Acknowledging the complexity inherent in strategic agility, our investigation specifically targets three variables: internationalization, age, and turbulence. These elements have been identified as particularly influential, each wielding a unique power to shape and mold strategic capabilities within organizations. This focus allows us to dissect the nuanced ways in which these variables may differentially impact the facets of strategic sensitivity, leadership unity, and resource fluidity, which are central to the strategic agility of an organization. Internationalization, for instance, is often viewed as a driver of organizational agility, pushing firms toward more adaptive and responsive strategies in the face of global challenges (Demir et al., 2021; Hagen et al., 2019). Conversely, the age of a firm is frequently correlated with its ability to remain agile, with younger firms typically displaying greater flexibility and older firms encountering obstacles to rapid adaptation (Loderer & Waelchli, 2010; Reed, 2021). Environmental turbulence, characterized by swift and unforeseeable market shifts, necessitates a firm's capacity for speedy reorientation and reallocation of resources—qualities that are imperative for maintaining strategic agility in uncertain environments (Clauss et al., 2021a; Doz & Kosonen, 2008a). Although these variables have been explored in various contexts concerning strategic agility, their collective influence on the specific dimensions of strategic sensitivity, leadership unity, and resource fluidity has not been examined.

### Internationalization and strategic agility

The interplay between internationalization and strategic agility has gained considerable attention in scholarly research. For example, Demir et al. (2021) clarified this relationship by demonstrating that for small and medium enterprises (SMEs) operating in diverse countries, strategic agility is integral to achieving international success. Hagen et al. (2019) similarly posited that strategic agility functions as a foundational element for internationalization, especially in early ventures, where it serves to mitigate the inherent risks of entering new markets. In contrast to these perspectives, de Diego et al. (2022) argued that internationalization may precede and foster strategic agility, suggesting a reciprocal dynamic. This notion is supported by evidence showing that exposure to international markets often spurs increased productivity and innovation within firms, indicating the likelihood that operating globally can enhance or even necessitate strategic agility (Almodóvar et al., 2014, 2021; Salomon & Jin, 2010; Salomon & Shaver, 2005). Therefore, as firms navigate the complexities of various international environments, they may develop and refine their strategic agility to maintain competitiveness and adaptability.

International firms need to comprehend strategic situations in more than one country; thus, they require awareness of trends and changes in the market. In addition, leaders in international firms likely find increased difficulty in aligning and integrating their views, as leadership in the country needs to balance their own local interests *versus* those of the global firm (Dunning & Mucchiellli, 2001). Some studies, such as Doz and Kosonen (2010), gave details on how firms need to anticipate changes in the environment to maintain their strategic advantage and create value. Lewis et al. (2014) expanded on this premise, mentioning that organizations must combine backward- and forward-looking thinking and engage ideas both top–down and bottom–up. Therefore, multinational enterprises are expected to exhibit higher levels of strategic sensitivity.

The existing literature highlights that when firms internationalize, a deliberate intention to exploit not only the firm's resources and capabilities that may be a source of competitive advantage (internalization theory refers to this concept as firm-specific advantages (FSAs)) but also the opportunities offered by the host country (i.e., country-specific advantages (CSAs)) emerges (Buckley & Casson, 1976; Hennart, 1982; Rugman, 1981, Rugman et al., 2011). To leverage this combination of FSAs and CSAs, firms must be able to identify the liability of foreignness specific to this host country and develop specific strategies oriented toward the reduction of this threat (Rugman & Verbeke, 2007; Rugman et al., 2011; Zaheer, 1995). Each country will have a different casuistry in terms of the type of liability of foreignness, the potential opportunities (CSAs), and the FSAs that will be transferable or operational in that host country. In this regard, firms need to sharpen their perception, attention, and awareness in these newer and less familiar environments (Debellis et al., 2021). Under these circumstances, the capabilities to anticipate (strategic foresight) and implement action plans (strategic insight) become crucial (Doz & Kosonen, 2008a). Consequently, the internationalization of the firm must promote mechanisms that collect valuable information on competitors, customers, and suppliers, among others, and stimulate a mindset

sensitive to external changes to be capable of designing and adapting strategic planning to the reality of the various international markets. Thus, we propose the following hypothesis:

*Hypothesis 1: Internationalization is positively related to strategic sensitivity.*

Firms need to gain leadership unity to successfully implement the strategic changes demanded by different international environments. For implementation to succeed, developing trust and empathy among the members of the organization is therefore necessary. In this case, firms could quickly make bold strategic decisions and encourage their members to collectively engage in the stipulated strategies (Debellis et al., 2021; Gurkov et al., 2017). However, the complexity involved in bringing the international dimension into leadership substantially hinders its "unity."

Executives responsible for different international markets are unlikely to work face-to-face. This situation may be due to their geographical distance from each other or simply to the growing trend toward teleworking. Such scenario explains the increasing use of remote communication channels such as instant messaging, e-mails, phone calls, and video conferences. However, remote channels have the disadvantage of damaging communication quality (Loode, 2021), which can be aggravated by the different cultures, disciplines, or levels of professional experience of executives (Horney et al., 2010). This situation increases the level of communication complexity, which further impedes mutual understanding and comprehension. Therefore, the trust, empathy, and interconnectedness of executives assigned to home and host countries are greatly hampered by this increased communication complexity. Negotiations and decision-making between executives within a firm are not without conflict (Morrill, 1995). These conflicts escalate when the cultural dimension (Morris et al., 1998) is introduced because dealing with different cultures creates significant difficulties in the co-management of operations (Morrill, 1995).

As the scale and scope of a firm's internationalization expand, the inherent complexity of achieving collaboration and consensus among executives dramatically intensifies. This rise of complexity has the potential to adversely impact leadership unity. Accordingly, we posit the following hypothesis:

*Hypothesis 2: Internationalization is negatively related to leadership unity.*

As previously indicated, the main trigger for the internationalization process of firms is the possession of FSAs that may facilitate competitive advantages (Almodóvar & Rugman, 2014, 2015; Rugman, 1981; Rugman et al., 2011). Thus, firms entering new markets often attempt to exploit these FSAs to replicate the home competitive advantage in the host country. However, Rugman and Verbeke (1992, 2001, 2007) argued that only a part of these FSAs is mobile or transferable across borders, as FSAs may lose their value. Therefore, Rugman and Verbeke classified FSAs into two types. On the one hand, non-location-bound FSAs are mobile FSAs among countries because they are not linked to their place of origin. Therefore, such FSAs can be exploited globally because they

retain their relevance and value wherever they are transferred. Thus, this type of FSA is often incorporated into the final products being exported because they do not require significant adaptation to the host country (Verbeke & Asmussen, 2016). On the other hand, location-bound FSAs are those that are linked to their country of origin because the firm needs to be nationally responsive and hence exploit national differences. This depiction implies that firms cannot easily transfer these FSAs to other countries without losing their value. Thus, if relocation or mobility between countries were necessary, then these FSAs would require significant adaptation. Moreover, location-bound FSAs would reach their full potential in the context of foreign subsidiaries.

Rugman and Verbeke (2001) specifically developed the subsidiaries' approach to internationalization and advanced the concept of subsidiary-specific advantages (SSAs). This theoretical development explains how subsidiaries abroad are capable of developing their own sources of competitive advantages to become responsive in their host countries. This case is the most complex possible, as foreign subsidiaries are characterized by dual embeddedness (i.e., externally embedded in host countries and internally embedded within the multinational enterprises (Nguyen & Almodóvar, 2018; Nguyen et al., 2022)). Hence, foreign subsidiaries must follow not only a strategy of global integration with the parent firm but also a strategy of local responsiveness specific to the foreign environment. SSAs are mostly location-bound and therefore highly difficult to transfer.

Building on the preceding discussion, the internationalization process of a firm is evidently closely intertwined with the mobility of its FSAs and SSAs. Some FSAs are non-location-bound and readily transferable across borders, thus maintaining their value and relevance, whereas other FSAs are location-bound, intricately tied to their origin and less adaptable to foreign markets. As firms expand their international operations, a plausible assumption is that managing the mix of transferable and non-transferable resources becomes more challenging. Particularly, the extent of non-transferable, location-bound FSAs and SSAs may potentially increase with greater international involvement. This situation inherently limits the ability of the firm to fluidly reallocate these strategically crucial resources across its global operations. This scenario suggests a constraint on the firm's ability to fluidly reallocate resources across global markets, leading to the formulation of the following hypothesis:

*Hypothesis 3: Internationalization is negatively related to resource fluidity.*

### Age and strategic agility

The influence of a firm's age on its strategic agility is a nuanced topic within organizational research. The consensus is that younger firms tend to exhibit greater agility; however, the mechanisms by which age affects the individual capabilities that constitute strategic agility—strategic sensitivity, leadership unity, and resource fluidity—remain underexplored.

The examination of strategic sensitivity shows that this crucial competency tends to diminish as firms age. Loderer and Waelchli (2010) underscored that with advancing age, firms frequently develop what can be termed as organizational rigidities. These rigidities, encompassing more than simply structural aspects, extend to the cultural and procedural realms. Erstwhile efficient and effective practices gradually become impediments to adaptation and innovation. This entrenchment often causes stagnation, making them increasingly misaligned with evolving market demands. Such a scenario is especially detrimental to strategic sensitivity, as it hinders a firm's agility in identifying and reacting to market shifts, new technologies, and evolving consumer preferences. Expanding on this concept, Loderer et al. (2017) further elucidated the impact of the aging process on the market behavior of a firm. As firms age, they exhibit a marked decline in proactive market engagement. This decline in proactivity reflects not only slower responsiveness but also a diminishing inclination to actively pursue new market opportunities. Older firms might shift their focus toward maintaining existing operations and assets, potentially at the cost of exploring and leveraging emerging market trends and opportunities. This shift from a proactive to a more reactive or preservation-focused stance indicates a significant alteration in how a firm interacts with its markets. Therefore, as firms age, their strategic sensitivity, or the ability to promptly perceive and adapt to market changes, is likely to be compromised. This decreased sensitivity can leave older firms trailing in rapidly changing markets, unable to respond as quickly or effectively as their younger counterparts. Consequently, we propose the following hypothesis:

*Hypothesis 4: Age is negatively related to strategic sensitivity.*

Leadership unity is crucial for strategic agility; however, its manifestation appears to be intricately linked to the firm's age. Doz (2020) argued that as firms mature, the ensuing impediments can obstruct collective commitment, which is at the core of leadership unity. These impediments often stem from the evolving needs and ambitions of executives, such as the pursuit of personal achievements or autonomy. As companies age and expand, they tend to develop distinct functions, specialized divisions, and decentralized operations, catering to these executive aspirations. Such diversification might be beneficial in certain aspects, but it might inadvertently dilute the focus and unity at the leadership level. This dispersion of focus and purpose can be particularly pronounced in older companies, potentially resulting in lower levels of leadership unity than those observed in their younger counterparts. Moreover, Reed (2021) supported this view through empirical findings, suggesting that strategic agility, which encompasses elements such as leadership unity, diminishes as firms age. The study reveals that older SMEs tend to lose some of the dynamism and flexibility that characterize their younger stages. In the context of leadership unity, this inference could mean that older firms struggle to maintain a cohesive and synchronized approach among their leadership teams. This challenge is compounded by the increasing complexity and diversity of operations and strategic needs as firms grow and age.

The aforementioned insights converge to depict a picture where the age of a firm relates to challenges in sustaining a unified leadership approach. The evolution of a firm produces structural and strategic changes that can create barriers to collective commitment and alignment among leaders. Therefore, we propose the following hypothesis:

*Hypothesis 5: Age is negatively related to leadership unity.*

Resource fluidity is essential to strategic agility. Gilbert (2005) shed light on a widespread challenge within organizations: resource rigidity, or the inability to adjust resource investment patterns, particularly in periods of discontinuous change. The perception of a threat can mobilize resources, but it can also exacerbate routine rigidity. In older firms, established investment patterns and organizational processes render the adaptation of resource allocation in response to rapid market shifts particularly challenging. This research also draws an important distinction between resource rigidity and routine rigidity, with each having different root causes and effects. Older firms may overcome resource rigidity in the face of threats, but they are often hindered by their inflexible routines, thereby impeding the innovative and efficient deployment of mobilized resources. Complementing this view, Doz and Kosonen (2008a) argued that resource fluidity erodes as the internal structures of a firm become more deeply rooted. Functions, subsidiaries, and divisions, once established, can ensnare resources, resulting in optimized but rigid systems that favor efficiency over adaptability. This structural rigidity can cause a lock-in phenomenon, in which firms become tied to key customers and partners, at times to their detriment, as structural rigidity can obscure the need and ability to adapt to market dynamics. This lock-in mindset can lead to organizational hubris, a state where past successes blind firms to the imperative of agility.

In older firms, resources may be bound to existing operations; at the same time, cultural and procedural barriers may also obstruct resource reallocation. The very structures that underpin past successes could inhibit these firms' navigation through new strategic terrains. Therefore, older firms confront the dual challenge of resource and routine rigidity, which hampers their ability to adapt resources to fit new and evolving market demands. These barriers are exacerbated by long-standing organizational practices that are poorly suited for the rapid redeployment of resources, which is necessary in a dynamic business environment. Accordingly, we posit the following hypothesis:

*Hypothesis 6: Age is negatively related to resource fluidity.*

### Turbulence and strategic agility

Stable environments enable strategies to be maintained over time or, if they need to be amended, they do so slowly (Grant, 2003; Mintzberg, 1993). Hence, firms operating in eminently stable environments are bound to become more rigid. The analysis of the issue of whether the reverse is equally certain and whether environmental turbulence is likely to foster strategic agility is therefore relevant.

Several studies have hypothesized that environmental turbulence has an impact on strategic agility, and some authors have considered this turbulence as a moderating effect. For example, Clauss et al. (2021a) used environmental turbulence as a moderating effect between strategic agility and business model innovation, whereas Reed (2020) utilized environmental turbulence as a moderator between firm age and strategic agility. Other studies have suggested that environmental turbulence is an antecedent to strategic agility. For example, Anggraini and Sudhartio (2019) investigated how strategic agility impacts the performance of the banking sector in

Indonesia and found that environmental turbulence has a positive impact on strategic agility, which in turn has a positive impact on competitive advantage and firm performance. de Diego et al. (2022) identified a set of drivers for strategic agility and also considered environmental turbulence as one of these drivers.

We understand that firms operating in predominantly turbulent environments are continuously subject to drastic changes (e.g., the emergence of disruptive innovations, new competitors, and new laws that change the rules of the game) that require adjustments in their strategies to ensure their survival. In the literature, Hall and Rowland (2016) found that a turbulent environment pushes firms to become more agile. Furthermore, several other scholars support that environmental turbulence is a relevant factor that impacts strategic agility (Clauss et al., 2021b; Ilmudeen, 2021; Reed, 2021; Vazquez-Bustelo et al., 2007). The positive impact of environmental turbulence on strategic agility as a whole and also on each of its capabilities is therefore expected.

In turbulent environments, the need to increase strategic sensitivity is of paramount importance. Doz and Kosonen (2008a) explained that as turbulence in the environment increases, strategic thinking must be based on superior strategic foresight and strong strategic insight. In this situation, the pace of strategic thinking is highly uneven. The firm may undergo periods of apparent calm in which strategic sensitivity is necessary, but such ability will not be accompanied by any concrete action. These periods will be followed by abrupt changes that will require agile action plans, but the previous inactivity may compromise the correct definition of the new strategy. Therefore, foresight is of vital importance to anticipate disruptions and shifting trends. Moreover, for a correct adaptation to the changing environment, forecasting needs to be complemented by strategic insight to enable the exploitation of ensuing opportunities.

We recognize the critical importance of strengthening foresight and enhancing insight in highly turbulent environments. Turbulence in the environment consequently encourages firms to further develop their strategic sensitivity. Hence, we propose the following hypothesis:

*Hypothesis 7: Turbulence is positively related to strategic sensitivity.*

In the context of ever-increasing turbulence, the role of leadership in fostering strategic agility gains prominence. Hall and Rowland (2016) asserted that the demands placed on leaders in such climates extend beyond traditional management skills; agile leadership particularly becomes essential to maintain a competitive advantage. Their research suggested that management education needs to evolve to cultivate leaders who are adept at navigating turbulent landscapes. In this line, Johansen and Voto (2014) identified the specific skills that leaders require in these challenging environments. The rapid and often disruptive changes inherent in turbulent environments necessitate a leadership approach that prioritizes mutual benefit and collective action. Thus, leaders are compelled to refine their ability to make difficult, sometimes wrenching, decisions and to forge collective compromises. This approach is not merely a response to change but also a proactive engagement with the dynamic business environment. The traditional business model may no longer suffice, and executives must be willing and prepared to

undertake significant strategic shifts to sustain the competitive edge of their firms. Doz and Kosonen (2010) reinforced this view by suggesting that strategic discontinuities and disruptions often require changes in business models. To overcome this challenge, Doz and Kosonen highlighted the importance of developing leadership unity as one of the core meta-capabilities for agility.

Drawing upon these insights, we contend that turbulent conditions function as a driving force for strengthening leadership cohesion in organizations. These circumstances necessitate that leaders participate in more profound conversations, disclose their intentions, merge their roles, synchronize their ambitions, and cultivate a culture in which joint commitments are actively sought and realized. The capability of executive teams to unite and lead through times of major change is crucial for the continued success of the company. Therefore, we propose the following hypothesis:

*Hypothesis 8: Turbulence is positively related to leadership unity.*

In the face of turbulent environments, the reallocation of resources with agility and precision becomes imperative for firms. This adaptive capacity often entails a paradigm shift away from conventional resource allocation protocols and toward a more dynamic and responsive organizational mindset. The capacity to efficiently redistribute resources, unhindered by historical commitments or inflexible plans, is crucial for resilience and competitiveness. Doz and Kosonen (2008b) illustrated this through Nokia's experience in the early 1990s, a period when the company exemplified strategic agility, allowing it to deftly steer through market instability. Strategic agility, as Doz and Kosonen suggested, transcends mere flexibility. Strategic agility encompasses a resolute commitment to strategy, underpinned by a readiness to decisively deploy resources when the situation demands. Nonetheless, this agility must be modulated with the capacity to reevaluate and pivot as the turbulence in the market dictates. Growth can ironically engender constraints, whereby pre-established procedures and a focus on predictability may inadvertently stifle the agility that facilitates success.

Acknowledging that firms in turbulent markets must foster resource fluidity to sustain competitive advantage, we posit the following hypothesis:

*Hypothesis 9*: *Turbulence is positively related to resource fluidity.*

Figure 1 presents the conceptual framework of the study, outlining the nine hypotheses proposed for empirical testing.

## Methodology and data gathering

### Sample

This study drew upon empirical data based on a survey of 220 Spanish firms operating in the service sector. Our sample covered firms with different workforce sizes: 72% of the firms are SMEs with less than 250 employees; 17% of

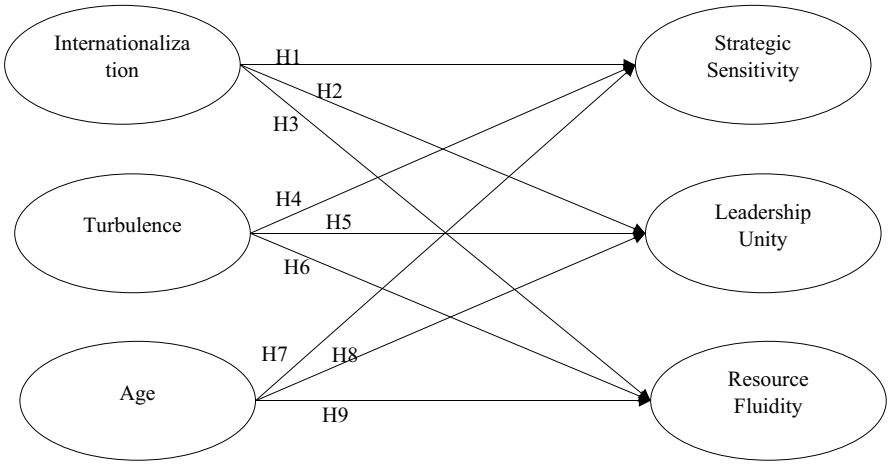


**Fig. 1** Conceptual Framework of the Hypothesized Relationships Among Internationalization, Turbulence, Age, and Strategic Agility Components

the firms comprised 251 to 1,000 employees; and 11% of the firms consisted of more than 1,000 employees. We deliberately chose to focus on a single sector to enhance its validity as a study, given that it reduces potential biases from various industry-specific exogenous factors (Harrigan, 1983). The survey instrument for the current study was meticulously designed by our research team, drawing upon relevant literature to ensure the comprehensive coverage of the constructs under investigation. Prior to data collection, the survey was refined through a collaborative process involving discussions with academic experts and CEOs from various industries. Their insights and feedback were instrumental in fine-tuning the design and content of the survey. Once the survey was finalized, data collection was conducted in 2022 by a leading market research company, publicly traded on the French stock exchange. This company, which specializes in accessing senior management levels (i.e., C-level, director, or equivalent), ensured the relevance and appropriateness of the respondents to our study. To enhance the validity of the data, the survey was administered in such a way that questions were presented in a randomized order, thereby preventing measurement items from being adjacent to each other and reducing the potential for response bias.

### Construct operationalization and measurement

The measurement of each of the capabilities that constitute strategic agility (*strategic sensitivity*, *leadership unity*, and *resource fluidity*) has been widely applied in the literature. Thus, with a high degree of consensus, each capability requires three questions measured on a Likert scale (Clauss et al., 2021a; de Diego et al., 2022). These questions are specified in Table 1.

The *internationalization* metric was measured, taking into account the Uppsala internationalization model (Johanson & Vahlne, 1977; Johanson & Wiedersheim-Paul, 1975). This model proposes a sequential approach (in terms of the level of commitment and the length of time the firm operates abroad) that accounts for its internationalization process. Therefore, we created a Likert variable, starting from a situation of no internationalization and ending with a high degree of commitment. More specifically, we adopted this categorization: (1) firms with no international presence; (2–3) firms that have different levels of seniority with respect to exporting and have no subsidiaries abroad; and (4–7) firms that, in addition to their involvement in exporting, operate subsidiaries abroad (we consider different levels of seniority). We followed de Diego et al. (2022) to measure environmental *turbulence*, whereby different aspects that could disrupt an industry were considered: the appearance of *new competitors*, *new regulations*, or *innovations*. Finally, *age* was measured by asking respondents about the moment when their firm was established and subtracting that value from 2022, a method used in other studies such as that of Almodóvar et al. (2021). Table 1 shows the specific survey questions used for each of the measurement items.

## Analytical model: SEM application in strategic agility research

The choice of SEM for our analysis is grounded in the literature and is aligned with recent studies in the field of strategic agility; these studies have employed this technique to unravel the relationships between various strategic dimensions (Clauss et al., 2021a; Reed, 2021). SEM is particularly useful for elucidating the complex relationships between multiple constructs, which is essential given our investigation into the nuanced dynamics among strategic agility, internationalization, firm age, and environmental turbulence (Hair et al., 2011; Shackman, 2013). The partial least squares (PLS) variant of SEM was strategically chosen for its capacity to manage formative and reflective constructs within our model, thus ensuring a precise measurement modeling and the accurate interpretation of the underlying constructs (Anderson & Gerbing, 1988; Hair et al., 2011). The PLS approach further complemented our analysis due to its efficacy with the moderate sample size of our study, encompassing 220 Spanish service sector firms, and its capacity to process the intricate model we had posited, thereby upholding the integrity and depth of our findings.

In terms of constructs, we considered *turbulence* as a formative construct that considers *new competitors*, *new regulations*, and *innovations*. As long as new entrants, new regulations, or innovations exist, we recognize that the construct should be affected. In other words, none of these indicators are interchangeable because each one contributes a specific meaning to the latent variable. We considered the three capabilities of strategic agility (*strategic sensitivity*, *resource fluidity*, and *leadership unity*) as three reflective constructs individually consisting of three indicators. Each indicator is expected to be correlated (i.e., an increase in *strategic sensitivity* is reflected in an increase of all three indicators). Due to the high correlations between the indicators, the indicators are interchangeable, and dropping an indicator should

**Table 1** Constructs for latent variables and measurement items

| Construct/ Latent Variable | Measurement Item | Survey Questions | Values | Mean | Standard Deviation | Excess Kurtosis | Skewness | Reference |
|---|---|---|---|---|---|---|---|---|
| **Internationalization** | One indicator aggregating two questions | When did your company start to sell products or services outside of Spain (e.g., through exports)?<br>When did your company make its first direct investment outside of Spain (e.g., part of the supply chain, research facilities, subsidiary)? | 1–7 | 3.618 | 2.462 | -1.704 | 0.075 | Inspired by Johanson and Vahlne (1977), Johanson and Wiedersheim-Paul (1975) |
| **Turbulence** | One indicator | In the past three years, have new entrants joined your industry, with the ability to alter the status quo of the incumbents? | 1–7 | 5.177 | 1.229 | 0.577 | -0.698 | de Diego et al. (2022) |
| | One indicator | In the past three years, has any innovation significantly "changed the rules of the game" in your industry (e.g., electric)? | 1–7 | 5.145 | 1.497 | 0.553 | -0.889 | |
| | One indicator | In the past three years, has any relevant regulation/law significantly "changed the rules of the game" in your industry (e.g., GDPR in the financial service industry)? | 1–7 | 5.195 | 1.359 | 0.493 | -0.741 | |
| **Age** | One indicator | When was your company founded?<br>*Values were obtained by subtracting the reported age from the year of the study (2022)* | 0–222 | 26.64 | 27.39 | 13.377 | 2.95 | Almodóvar et al. (2021), Reed (2021) |

**Table 1** (continued)

| Construct/ Latent Variable | Measurement Item | Survey Questions | Values | Mean | Standard Deviation | Excess Kurtosis | Skewness | Reference |
|---|---|---|---|---|---|---|---|---|
| **Strategic Sensitivity** | One indicator | We are very sensitive to external changes (regarding customers, competitors, technologies, and so on) and integrate these changes into the strategic planning of our company | 1–7 | 5.223 | 1.379 | 0.586 | -0.857 | Clauss et al. (2021a), de Diego et al. (2022) |
| | One indicator | We utilize different mechanisms to become aware of strategic developments beforehand (i.e., we survey our clients, conduct market studies, assess our competitors, assist in conferences) | 1–7 | 5.177 | 1.443 | 0.126 | -0.761 | |
| | One indicator | Requirements for strategic adaptation are communicated rapidly and comprehensively throughout the organization | 1–7 | 5.264 | 1.329 | -0.045 | -0.611 | |
| **Leadership Unity** | One indicator | Our top management is able to make bold and quick strategic decisions | 1–7 | 5.4 | 1.366 | 0.273 | -0.784 | |
| | One indicator | Our management collaborates for strategic decisions | 1–7 | 5.659 | 1.224 | 0.585 | -0.868 | |
| | One indicator | Strategic decisions are collectively solved by our management without being embroiled in top-level "win–lose" politics | 1–7 | 5.286 | 1.545 | 0.21 | -0.861 | |
| **Resource Fluidity** | One indicator | We are able to fluidly reallocate and utilize capital resources | 1–7 | 5.386 | 1.214 | 0.837 | -0.73 | |
| | One indicator | Our people and their competencies are highly mobile within our organization | 1–7 | 5.268 | 1.285 | 1.181 | -0.888 | |
| | One indicator | Our organizational structure allows for the flexible redeployment of our resources | 1–7 | 5.464 | 1.266 | 1.292 | -1.007 | |

not alter the conceptual meaning of the construct (Jarvis et al., 2003). Finally, we modelled *internationalization* with the newly created variable that considers the commitment of the firm toward internationalization and *age* with one indicator that reflects the number of years that the firm has been in operation. The values for each of the constructs are specified in Table 1.

### Construct validity and reliability analysis

We assessed the validity of the constructs based on common reliability and validity measures (Hair et al., 2011). Table 2 shows the loadings for indicators, which are all (except for one indicator, *innovation*) above the threshold value of 0.7, signifying good indicator reliability (Chin, 2010). The *innovation* indicator has a loading of 0.573, which is, in any case, above 0.5, denoting that it makes a sufficient contribution to forming the construct and thus needs to remain (Hair et al., 2022).

As shown in Table 3, composite reliability is above the threshold of 0.7, affirming the internal consistency of the constructs. Similarly, the average variance extracted (AVE) values for all the constructs are above 0.5, suggesting a satisfactory level of convergent validity (Hair et al., 2011).

For the adequate discriminant validity of the constructs, we tested the cross-loadings, ensuring that no item loaded more significantly on a construct other than the one with which it was associated. This analysis, presented in Table 4, aligns with the standards set by Hair et al. (2011) and confirms that each item most strongly relates to its intended construct, thereby supporting the distinctiveness of each construct.

In addition to the previously discussed measures, we rigorously examined the potential for multicollinearity in our formative constructs, which is crucial for ensuring the accuracy of our model. The variance inflation factors (VIFs) for these constructs were evaluated to identify any collinearity issues. The results indicated that

**Table 2** Outer loading of indicators

| Variable | Age | Internationalization | Leadership Unity | Resource Fluidity | Strategic Sensitivity | Turbulence |
|---|---|---|---|---|---|---|
| *Resource Fluidity 1* | | | | 0.855 | | |
| *Resource Fluidity 2* | | | | 0.799 | | |
| *Resource Fluidity 3* | | | | 0.892 | | |
| *Internationalization* | | 1.000 | | | | |
| *Age* | 1.000 | | | | | |
| *New Competitors* | | | | | | 0.859 |
| *Innovation* | | | | | | 0.573 |
| *New Regulations* | | | | | | 0.822 |
| *Strategic Sensitivity 1* | | | | | 0.730 | |
| *Strategic Sensitivity 2* | | | | | 0.860 | |
| *Strategic Sensitivity 3* | | | | | 0.838 | |
| *Leadership Unity 1* | | | 0.867 | | | |
| *Leadership Unity 2* | | | 0.885 | | | |
| *Leadership Unity 3* | | | 0.835 | | | |

**Table 3** Construct reliability and validity

| | Cronbach's Alpha | Composite Reliability (rho_a) | Composite Reliability (rho_c) | Average Variance Extracted (AVE) |
|---|---|---|---|---|
| *Leadership Unity* | 0.828 | 0.831 | 0.897 | 0.744 |
| *Resource Fluidity* | 0.808 | 0.827 | 0.886 | 0.722 |
| *Strategic Sensitivity* | 0.742 | 0.766 | 0.852 | 0.659 |

all the constructs had VIF values well below the conservative threshold of 3, suggesting no significant multicollinearity concerns. Specifically, the VIF for *new competitors* was found to be 1.317, *innovation* scored a VIF of 1.275, and *new regulations* had a VIF of 1.353. These low VIF values, far below the threshold, indicate that our model is free from collinearity problems, reinforcing the validity of our construct measurements and ensuring the reliability of our analysis (Hair et al., 2022).

All our assessments affirm the robustness of our methodological approach. This thorough validation process bolsters confidence in our study findings and provides a firm foundation for the subsequent interpretations and discussions.

## Hypothesis testing and discussion

The SEM used for testing our hypotheses is presented in Fig. 2, and we delineate the complex interdependencies between *internationalization*, *turbulence*, and firm *age* as they influence the essential aspects of strategic agility, namely *strategic*

**Table 4** Cross-loading of indicators

| Variable | Age | Internationalization | Leadership Unity | Resource Fluidity | Strategic Sensitivity | Turbulence |
|---|---|---|---|---|---|---|
| *Resource Fluidity 1* | -0.103 | 0.060 | 0.653 | **0.855** | 0.622 | 0.408 |
| *Resource Fluidity 2* | 0.007 | 0.134 | 0.642 | **0.799** | 0.540 | 0.392 |
| *Resource Fluidity 3* | -0.090 | 0.137 | 0.750 | **0.892** | 0.697 | 0.496 |
| *Internationalization* | 0.261 | **1.000** | -0.008 | 0.131 | 0.253 | 0.287 |
| *Age* | **1.000** | 0.261 | -0.097 | -0.077 | -0.038 | 0.066 |
| *New Competitors* | 0.036 | 0.257 | 0.445 | 0.440 | 0.449 | **0.859** |
| *Innovation* | 0.047 | 0.290 | 0.266 | 0.265 | 0.356 | **0.573** |
| *New Regulations* | 0.076 | 0.188 | 0.414 | 0.431 | 0.431 | **0.822** |
| *Strategic Sensitivity 1* | -0.017 | 0.113 | 0.489 | 0.480 | **0.730** | 0.355 |
| *Strategic Sensitivity 2* | 0.012 | 0.332 | 0.530 | 0.581 | **0.860** | 0.470 |
| *Strategic Sensitivity 3* | -0.090 | 0.142 | 0.683 | 0.715 | **0.838** | 0.457 |
| *Leadership Unity 1* | -0.080 | -0.003 | **0.867** | 0.645 | 0.609 | 0.442 |
| *Leadership Unity 2* | -0.061 | 0.028 | **0.885** | 0.731 | 0.637 | 0.476 |
| *Leadership Unity 3* | -0.113 | -0.050 | **0.835** | 0.709 | 0.561 | 0.390 |

Indicators displayed in bold indicate the highest loading of each item on its corresponding construct, confirming that items do not load more significantly on any construct other than the one they are intended to measure

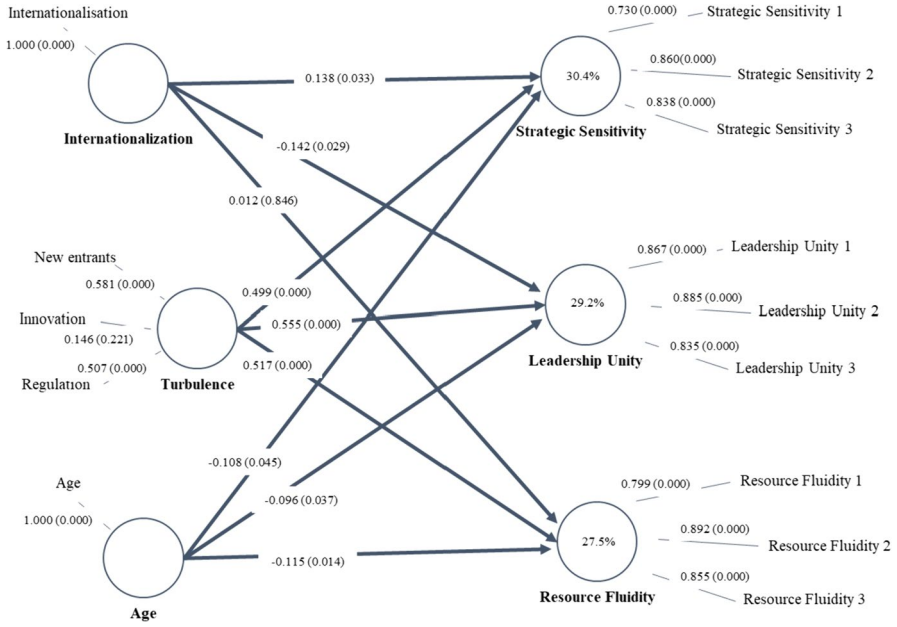


**Fig. 2** Graphical representation of the model with loadings, path coefficients, and *p*-values

*sensitivity*, *leadership unity*, and *resource fluidity*. The indicators of the model are substantiated by the loadings and associated *p*-values, which affirm the reliability of our measurement constructs. Moreover, the path coefficients, annotated on the interlinking arrows with corresponding *p*-values, reveal the magnitude and statistical significance of the connections between the constructs. Importantly, the model accounts for 30.4% of the variance in *strategic sensitivity*, 29.2% in *leadership unity*, and 27.5% in *resource fluidity*, underscoring the substantial explanatory power of the antecedent variables. These values are at least in line with and often higher than other recent studies (Clauss et al., 2021a; Reed, 2021), providing good support for our results.

Our exploration of the relationship between internationalization and strategic agility reveals significant insights, particularly in the context of strategic sensitivity and leadership unity. The positive correlation found between *internationalization* and *strategic sensitivity* (Hypothesis 1), indicated by a positive and significant path coefficient of 0.138 (*p*-value = 0.033), underscores the advantages that international firms have in gathering and responding to market information. This result suggests that global operations enhance the ability of a firm to adapt to diverse market conditions, and this finding resonates with our theoretical framework and emphasizes the importance of *strategic sensitivity* in multinational settings. By contrast, the results do not support Hypothesis 2. We found a significant, but negative, path coefficient of -0.142 (*p*-value = 0.029), which illustrates the complexities introduced by internationalization in terms of leadership unity. The negative relationship between *internationalization* and *leadership unity* highlights the challenge of aligning leadership

across different cultural and operational environments. This outcome signifies that although expanding into international markets offers benefits in terms of market awareness and responsiveness, such expansion concurrently complicates the unification of leadership approaches. This complexity is especially pertinent for multinational firms, in which integrative and culturally sensitive leadership strategies become essential to maintain effective global operations. Interestingly, our investigation into the impact of *internationalization* on *resource fluidity* (Hypothesis 3) did not yield a statistically significant result, with a path coefficient of 0.012 ($p$-value = 0.846). This outcome suggests that the anticipated challenge of reallocating resources across international markets may not be as significant as previously believed, indicating a potential shift in the manner by which firms manage resources in a global context. This lack of significant impact contradicts some existing theories and merits further exploration into the issue of how multinational enterprises manage and allocate resources amid their international operations.

Shifting the focus to the relationship between firm *age* and strategic agility, our study provides robust empirical support for our hypotheses. The significant and negative path coefficients of Hypothesis 4 (-0.108, $p$-value = 0.045), Hypothesis 5 (-0.096, $p$-value = 0.037), and Hypothesis 6 (-0.115, $p$-value = 0.014) indicate a relevant relationship between the maturity of a firm and a decline in each dimension of strategic agility (*strategic sensitivity*, *leadership unity*, and *resource fluidity*). The support for Hypothesis 4 posits that older firms may struggle to maintain the acute awareness and responsiveness required to effectively navigate the rapidly evolving market landscape. This diminishing sensitivity can result in a slower adaptation to new market demands and technological shifts, which younger firms may more adeptly address due to their inherently less rigid structures and processes. Thus, our study suggests that as firms age, strategic sensitivity becomes compromised. Regarding Hypothesis 5, the findings indicate that older firms might encounter difficulties in sustaining a unified leadership approach. As organizations grow and the complexity of their structure increases, the alignment of leadership across various divisions can confront challenges, potentially reducing the cohesiveness of decision-making and strategic direction. Moreover, the support for Hypothesis 6 underscores the idea that resource fluidity is likely to be hindered in older firms. The established routines and ingrained organizational practices that once served as a foundation for past successes may now function as barriers to the flexible reallocation of resources, which is essential for agile responses to new opportunities and market threats.

Our study further illuminates the relationship between environmental *turbulence* and strategic agility, as our findings provide support for Hypotheses 7, 8, and 9. Hypothesis 7 posited a positive linkage between environmental *turbulence* and *strategic sensitivity*; this proposition finds substantial empirical support with a path coefficient of 0.499 ($p$-value < 0.001). This result highlights the adaptive responses elicited by firms when confronted with rapidly shifting environmental conditions. As turbulence intensifies, the need for firms to enhance their foresight and insight also increases, ensuring that they are not only reactive but also proactive in the face of market disruptions and trends. Our findings resonate with the assertions of Doz and Kosonen (2008a), suggesting that strategic sensitivity is heightened in turbulent times, which aids firms in navigating the complexities of global markets with

discernment and agility. The validation of Hypothesis 8, reflected in a path coefficient of 0.555 ($p$-value < 0.001), elucidates the critical role of *leadership unity* in turbulent scenarios. Our results indicate that a turbulent environment catalyzes the consolidation of leadership efforts, hence fostering a collective resolve that is both responsive and anticipatory. This unity is not merely a defensive posture but also a strategic consolidation that enhances the agility and resilience of the firm. The support for Hypothesis 9, demonstrated by a path coefficient of 0.517 ($p$-value < 0.001), signifies the vitality of *resource fluidity* amid uncertainty. The positive relationship between *turbulence* and *resource fluidity* echoes the strategic agility exemplified by Nokia in the early 1990s, as discussed by Doz and Kosonen (2008b). Firms that operate in turbulent markets are compelled to adopt flexible resource allocation strategies that transcend traditional paradigms. This fluidity, as our study suggests, is imperative for firms to harness opportunities and navigate disruptions with efficacy. This result is consistent with other studies in that turbulence is a relevant factor that impacts strategic agility and makes firms more agile (Clauss et al., 2021a; Hall & Rowland, 2016; Ilmudeen, 2021).

## Conclusions

This study provides a novel approach for dissecting the complex interplay between firm internationalization, age, and environmental turbulence and their collective impact on the dimensions of strategic agility. Although strategic agility has been acknowledged as a pivotal agenda item for corporate leadership and a subject of growing scholarly interest (de Diego & Almodóvar, 2022; Doz & Kosonen, 2008a), the nuanced effects of these specific factors on the key components of strategic agility have not been thoroughly explored until now. By pioneering a comprehensive examination that concurrently investigates these variables, our research unveils novel insights into the dynamic nature of strategic agility, challenging and extending the current paradigms within the academic discourse.

Our empirical findings illuminate the dualities and intricacies inherent in the relationship between internationalization and strategic agility, thereby offering a nuanced understanding that transcends traditional analyses. Furthermore, by clarifying the consistent impacts of firm age and environmental turbulence across all the components of strategic agility, our study not only corroborates existing theories but also uncovers new avenues for future research. Therefore, this research serves as a critical stepping stone for both academic and practical exploration, setting the stage for a deeper investigation into how firms can navigate the difficulties of the modern business landscape to maintain and enhance their strategic agility. The specific theoretical and practical implications are outlined below.

### Theoretical implications

This study significantly advances the conceptualization of strategic agility, particularly in relation to internationalization, environmental turbulence, and firm age. Our

work delves deeper into the nature and scope of strategic agility by unveiling the complex interplay between these factors and strategic sensitivity, leadership unity, and resource fluidity. By concurrently examining these variables, the research provides a nuanced understanding of how they intertwine to affect the capability of a firm to effectively navigate strategic challenges.

The findings on internationalization are particularly groundbreaking, revealing a dual effect on strategic agility. The positive influence on strategic sensitivity underscores the value of international exposure in sharpening the environmental awareness and responsiveness of firms. However, the negative impact on leadership unity opens a new line of inquiry, suggesting that international broadening may introduce complexities in leadership alignment that were previously underexplored. This duality enriches the discourse on international business strategy and highlights the need for more granular investigations into how cross-border operations influence managerial processes and decision-making. Furthermore, the non-significance of internationalization's impact on resource fluidity presents a compelling avenue for further research. The matter of whether this finding is specific to the sample studied or indicative of a broader trend also raises questions, thus warranting additional investigation.

The anticipated effects of environmental turbulence and firm age align with existing theories, reinforcing their roles as critical factors influencing strategic agility. The confirmation that these effects are consistent across all the dimensions of strategic agility (i.e., strategic sensitivity, leadership unity, and resource fluidity) not only corroborates the existing literature but also enhances the understanding of their pervasive impact.

## Practical implications

The intricate relationship among a firm's internationalization, environmental turbulence, and organizational age, as found in our research, presents a set of critical practical implications for managers operating within the service sector. Thus, understanding the positive relationship between internationalization and strategic agility in its entirety is crucial for business leaders. This inference suggests that firms engaged in international activities tend to develop a keener ability to sense and rapidly respond to market changes, which is attributed to the enhanced strategic agility of firms. However, the dual effect of internationalization on the components of strategic agility necessitates a nuanced approach from managers. The positive relationship of internationalization with strategic sensitivity indicates that exposure to diverse international markets likely boosts the ability of a firm to anticipate and react to environmental changes. This could be due to the necessity to overcome the liability of foreignness (Johanson & Vahlne, 1977), which compels firms to be more attuned to unfamiliar market dynamics, regulatory environments, and competitive landscapes. This heightened awareness can translate into a more profound strategic sensitivity, as firms must continuously learn and adapt to survive and thrive in new contexts. However, the negative impact of internationalization on leadership unity introduces a complex challenge for managers. This challenge may arise from the intricacies involved in coordinating leaders across different geographical locations,

each with distinct cultural norms and business practices. As firms expand internationally, maintaining a unified leadership approach becomes more challenging, which might inadvertently hinder their overall strategic agility. To address this challenge, managers might consider implementing mechanisms that enhance communication and understanding among leaders from diverse cultural backgrounds. One such practice could be the developmentof intercultural workshops and training sessions that focus not only on general cultural awareness but also on the alignment of corporate values and leadership philosophies across the board. Additionally, leveraging collaborative technologies to organize virtual meetings might facilitate regular cross-border discussions and, therefore, the opportunity to understand the different approaches of other leaders in real time. Furthermore, managers could establish global leadership development programs that rotate high-potential leaders through different international offices. This immersion might foster an improved understanding of the nuances within each market and create a group of "international-minded" leaders who share a common experience base, thereby enhancing unity. Finally, regular leadership retreats might also be a strategic investment because these retreats could serve as a common space for leaders to get to know each other, align on strategic objectives, openly discuss challenges, and build a shared vision for the firm.

The finding that environmental turbulence positively influences strategic agility offers a paradigm shift for managers in the service sector. Traditionally perceived as a threat, a turbulent environment is currently recognized as a catalyst for enhancing the strategic agility of a firm, turning perceived volatility into a strategic advantage. This positive association suggests that firms operating in dynamic environments are prompted to become more alert, adaptable, and innovative to maintain competitiveness. Focusing on the individual components of strategic agility, each aspect uniquely benefits from environmental turbulence. The enhancement of strategic sensitivity in turbulent environments is a crucial adaptation for firms. Managers should invest in advanced market monitoring systems and analytics to continuously scan and interpret market trends. This proactive strategy might enable firms to anticipate changes and swiftly adjust their strategies. For leadership unity, turbulence can function as a unifying force, driving leadership teams to align closely to collectively navigate the unpredictability. Engaging in regular scenario planning might bolster this unity, as such approach prepares the team to tackle potential disruptions with a cohesive, strategic response. The process of creating and revisiting scenarios cultivates a collective understanding of potential futures, thus aligning leaders around common goals and strategies. Finally, a turbulent environment can significantly increase resource fluidity, as it forces firms to reassess and reallocate resources more efficiently in response to rapid changes. Building adaptable supply chains and encouraging a mindset of "fail fast, learn faster" might allow firms to pivot and adapt their service offerings in real time. These strategies ensure that resources are not fastened to outdated modes of operation but are instead fluid and available for innovative new projects that can satisfy the changing demands of the market.

According to our findings, the aging process of a firm may introduce a degree of rigidity that impairs strategic agility. As firms age, they may find themselves less adaptable to the rapid shifts that characterize modern markets. This inherent rigidity presents a direct challenge to the components of strategic agility. The negative

impact of firm age on strategic sensitivity suggests that as companies grow older, their ability to anticipate and respond to environmental changes diminishes. To address this challenge, managers could implement dedicated teams responsible for environmental scanning and trend analysis. Moreover, nurturing an internal culture that encourages curiosity and an external orientation among employees might maintain the strategic sensitivity of the company. Encouraging staff at all levels to engage with market insights and participate in strategy development forums might retain the sharpness of the organization's senses. As firms mature, the unity among leaders might decline, potentially due to entrenched perspectives or siloed departmental interests. To address this concern, managers might promote leadership unity by instituting regular leadership alignment sessions, which reiterate the vision and objectives of the firm. Implementing rotational leadership programs might also be beneficial, whereby leaders spend time in different parts of the business to build empathy and understanding across organizational boundaries. Such practice can help mitigate the "silo effect" and ensure that leaders develop a more cohesive approach to firm strategy. Finally, with age, firms often experience a decrease in resource fluidity as departmental territories become established and internal politics play a larger role. To enhance resource fluidity, managers might consider creating cross-departmental project teams for key strategic initiatives. This initiative might help dismantle the barriers to resource sharing and encourage a more fluid approach to the firm's resources.

## Limitations and future research lines

In advancing the understanding of strategic agility within the realms of internationalization, firm age, and environmental turbulence, this study has significantly contributed to academia. Nevertheless, acknowledging certain limitations that simultaneously pave the way for future research endeavors is essential.

First, the sample size we used is adequate for studies with PLS-SEM (Hair et al., 2011); however, potentially larger sample sizes could have indicated clear results on the relationship between internationalization and resource fluidity. Second, our focus on the three key drivers of strategic agility was based on their prevalent attention in recent editorials and literature. Nonetheless, as de Diego et al. (2022) demonstrated, a broader array of factors influence strategic agility. Thus, further studies could consider other drivers, such as organizational size and entrepreneurial mindset, and assess their impact on strategic agility. Third, we deliberately relied on sector-specific data from one country, but further research could test the generalizability of these results for other sectors and other countries. Specifically, future research lines could consider assessing the differences among various sectors and determining whether statistically significant differences in their levels of strategic agility occur. Fourth, a key limitation of our study is its cross-sectional nature, which does not capture the dynamic evolution of strategic agility over time. Longitudinal studies in this area could provide invaluable insights into how the interplay between internationalization, age, and environmental turbulence influences the trajectory of strategic agility.

Additionally, in the rapidly evolving digital era, the role of technological advancements, particularly artificial intelligence, in shaping strategic agility presents an exciting avenue for future research. Investigating how artificial intelligence and digital transformation influence strategic decision-making, adaptability, and resource management would significantly contribute to the discourse on strategic agility in the digital age. Finally, our study did not directly link strategic agility to financial performance. Hence, future research examining this relationship could provide critical insights into how strategic agility translates into tangible financial success. This exploration would offer a more concrete understanding of the business impact of strategic agility and could guide firms in aligning their strategic agility initiatives with financial objectives.

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## Declarations

**Competing interests** All authors declare that they have no conflicts of interest



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