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Resilience of Spanish Firms: a comparative analysis of large and small businesses in the face of 2008 financial crisis and COVID-19

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Abstract:

The global impact of the COVID-19 crisis has revealed divergent outcomes for businesses, with large corporations thriving while small companies facing challenges. Analyzing the Spanish market, which relies heavily on tourism and lacks large international companies, challenges conventional analyses. Despite these anomalies, business closures align with global trends. Applying the dynamic organizational resilience model —Absorption, Adaptation, and Learning— we propose that large Spanish companies, having weathered the 2008 financial crisis, were better equipped for COVID-19. This article investigates whether deploying organizational resilience justifies the Spanish market's response, exploring the influence of company size and crisis type on survival capacity between 2007 and 2023.

Key words:

Organizational resilience; Spanish market; 2008 financial crisis; COVID-19 crisis.

1. Introduction

The COVID-19 crisis has had a different impact on businesses worldwide. While large corporations have not only survived but, in many cases, thrived significantly, small businesses have faced severe challenges, and for many of them, their post-pandemic survival is considered compromised. The evolution of companies in bankruptcy in Spain during the COVID-19 crisis reveals a trend similar to that reported globally. However, there are peculiarities and factors in the Spanish market that do not align with the proposed analyses and explanations, especially the severe impact of the COVID-19 crisis on economies highly dependent on tourism and less diversified economies (World Bank, 2022). Studies on post-COVID-19 recovery indicate that large and technology-oriented companies handled the crisis more comfortably (OECD, 2021). This contrasts with three significant peculiarities in the Spanish market, which, according to several analyses (ONTSI, 2021; Spanish National Institute of Statistics, 2023), have had a substantial impact on how companies traversed the COVID-19 crisis: 1) The Spanish economy (and the companies operating within it) heavily depends on tourism, leisure and hospitality businesses; 2) Large companies are scarce in the Spanish market, and those considered large are not very large on an international scale. 3) Spanish companies' involvement in technology businesses is minimal.

To understand the Spanish market, we use the theory and models of organizational resilience. Among the various models explaining and conceptualizing organizational resilience, the dynamic three-phase formulation —Absorption, Adaptation, and Learning (Sevilla-Ruiz et al., 2023)— holds particular relevance. In the first phase, the organization absorbs the impact of change as best as possible. Second, the organization restructures and adjusts to work in new conditions. Finally, conclusions are drawn,

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and the organization learns from the experience. This helps us understand the Spanish market during the COVID-19 crisis because, in our view, large Spanish companies deployed this process during the 2008 financial crisis, while SMEs were not able to deploy and complete the process. Consequently, large companies were able to handle the impacts of the COVID-19 crisis better than SMEs.

This article aims to address whether the deployment of the dynamic organizational resilience process justifies how firms performed in the Spanish market during the COVID-19 crisis. Analyzing the Spanish market from this perspective between 2007 and 2023, two questions arise: 1) Does the size of the company influence its survival capacity in any crisis? 2) Does the type of crisis influence the type of companies that survive?

To address these questions, we first analyze the composition of the Spanish market to demonstrate the scarcity of large companies and their minimal participation in digital services. Next, we present the dataset of bankrupt companies in Spain between 2005 and 2022. We also introduce the analysis techniques used to determine the data's relevance and representativeness. Once the validity of the data is established, we analyze it to address research questions 1 and 2 and highlight the implications on organizational resilience by comparing the performance of large companies and SMEs.

2. Framing the study within the context of organizational resilience

Before presenting, analyzing, and discussing the data from the Spanish market, it is important to justify (1) how this study fits within the context of organizational resilience and (2) what is the dependency and relationship with business continuity.

Organizational resilience and business continuity are two disciplines that might appear to compete with one another. However, this is not the case. Organizational resilience refers to an organization's ability to anticipate, prepare for, respond to, and adapt to incremental changes and sudden disruptions to survive and thrive (Ruíz-Martín et al., 2018). It encompasses a variety of practices and attributes that allow an organization to maintain essential functions during a crisis and recover faster afterward. Business continuity refers to the process of creating prevent and recovery systems to deal with potential threats to a company (Cerullo and Cerullo, 2004). In this sense, the goal of Business continuity is to enable ongoing operations during and after a disruption, ensuring that critical business functions can continue despite adverse circumstances.

The main differences between the two disciplines are in their scope and focus. Organizational resilience has a broader scope, focusing on the organization's overall ability to adapt and thrive in the face of various disruptions, including long-term changes. Business continuity is more focused on ensuring that specific critical functions can continue during and after a disruption. Additionally, organizational resilience encompasses cultural, strategic, and operational dimensions, promoting flexibility, innovation, and continuous learning, while business continuity is primarily operational, focusing on maintaining essential services and functions.

In the following sections, we will present, analyze, and discuss data and reports showing the major stressors and challenges faced by the Spanish market in recent years, with particular emphasis on the last two major global crises: the 2008 Financial Crisis and the COVID-19 pandemic.

3. Spanish Market Composition: Companies by Number of Employees

In this section, we analyze and describe the distribution of companies by number of employees in the Spanish market.

In recent decades, the Spanish market has undergone significant transformations (Faris et al., 2020; Ferrer et al., 2022; Hernández and Martínez, 2017), prompting a comprehensive analysis of the distribution of companies based on their employee size. Using data from Spanish governmental sources (Spanish National Institute of Statistics, 2023), we categorize companies into four groups: microenterprises (up to 9 employees), small enterprises (10 to 49 employees), medium-sized enterprises (50 to 249 employees), and large enterprises (more than 300 employees) (European Commission, 2003). Notably, microenterprises, constituting 80% of the market, have a vital role in the economy, particularly in family businesses. SMEs

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enterprises contribute significantly to the business network, with a focus on diverse sectors, while large enterprises, though a minority, influence strategic sectors like energy and telecommunications. Trends highlight the dominance of smaller enterprises, the concentration of large enterprises in key sectors, and the critical role of medium-sized enterprises in job creation and economic diversification. This analysis serves as a valuable foundation for policymaking, entrepreneurship support, and enhancing business competitiveness in the dynamic Spanish market.

Figure 1 illustrates the average distribution of companies in the Spanish market based on their number of employees between 2005 and 2022. It can be observed that microenterprises are 80% of the market, and the proportion of large companies does not exceed 0.4%.

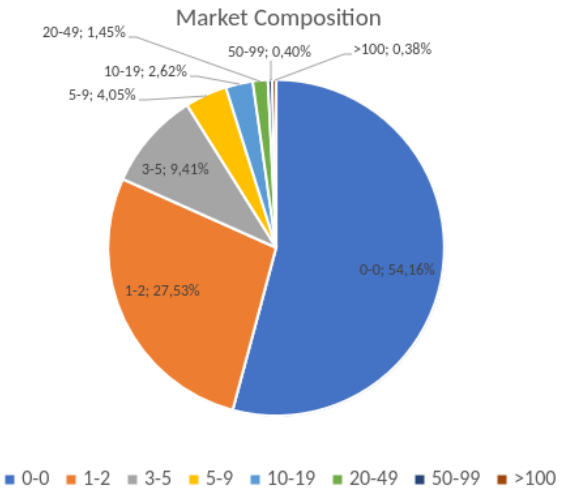


Figure 1. Spanish market composition.

4. Model's data set: Companies in Bankruptcy in Spain between 2005 and 2022

The data for our study comes from the INE (National Institute of Statistics) (Spanish National Institute of Statistics, 2023) and represents the number of companies in bankruptcy in Spain between 2005 and 2022, inclusive. The companies are grouped based on their number of employees into a total of eight categories: No employees, 1 to 2 employees, 3 to 5 employees, 6 to 9 employees, 10 to 19 employees, 20 to 49 employees, 50 to 99 employees, and companies with more than 100 employees.

To validate the data stratification, a non-linear analysis using Self-Organizing Maps (SOMs) was conducted. SOMs, also known as Kohonen maps, are unsupervised learning algorithms widely utilized for dimensionality reduction, clustering, and pattern recognition across various fields (Amerijckx et al., 1998; Kohonen, 2013; Sarlin and Eklund, 2011). Comprising nodes arranged in a grid, each representing a category, SOMs learn through competition and cooperation mechanisms during the training phase. They effectively reduce dimensionality, allowing visualization of high-dimensional data in lower-dimensional spaces while preserving topological relationships.

SOMs excel in clustering, identifying patterns, and detecting outliers. They are applicable to tasks like image classification and speech analysis. Operating in unsupervised learning, they accommodate unstructured or unlabeled datasets. However, their performance can be sensitive to initial parameters (such as grid dimensions, lambda factor, or initial weights), and the interpretability of results may pose challenges. As the size and dimensionality increase, computational complexity grows.

Considering these factors, SOMs are deemed suitable for evaluating the appropriateness of bankruptcy data for the intended purpose. Employing SOMs will assess the independence of data on bankrupt companies, ensuring low coupling between time series and adequate representation within each category.

4.1. Model's data set validation

The objective of this initial analysis is to determine whether the categories we defined for the companies in bankruptcy are suitable. We aim to understand whether the different categories are independent of each other or if, conversely, there is some level of coupling among them.

Figure 2 shows the quarterly evolution of companies in bankruptcy across different categories between 2005 and 2022. We employ a Self-Organizing Map (SOM) to estimate the degree of similarity among the various time series. It is known that a SOM tends to group similar time series together in nearby nodes.

When using the SOM to create the classification, we follow a 3-step process:

1. Normalization of time series: Each element of every temporal series is normalized by the total number of companies at the national level within

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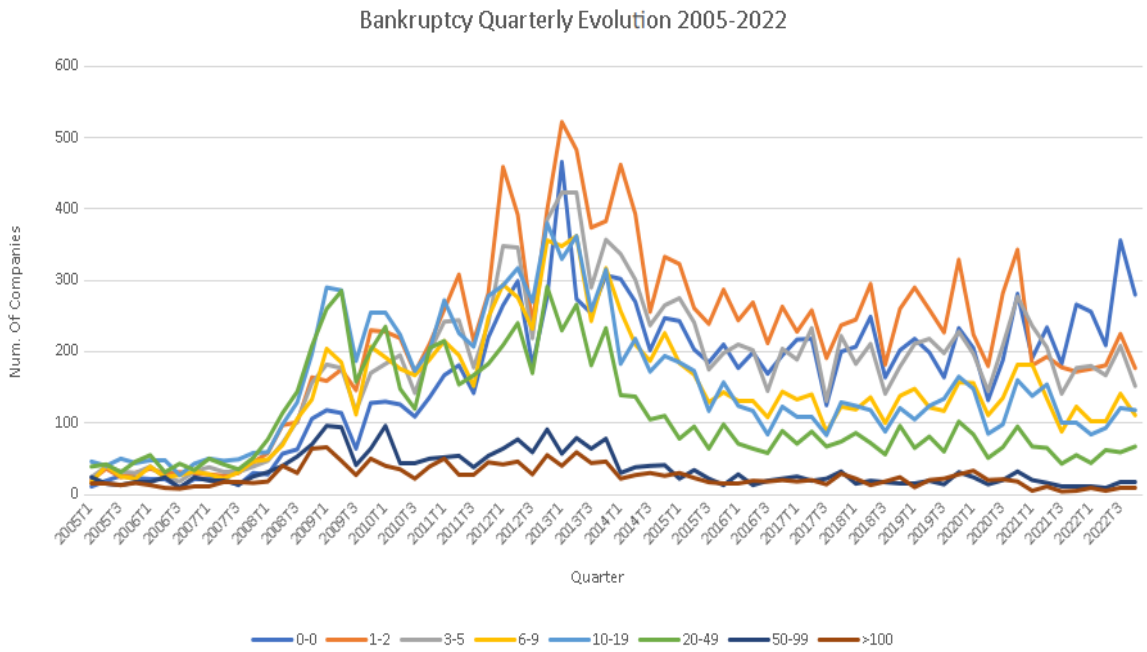


Figure 2. Bankruptcy situations across different categories between the years 2005 and 2022.

that category and year. For instance, the number of companies in bankruptcy during the second quarter of 2009 in the 5-9 employees category is normalized by the total number of companies in 2009.

1.1 Selection of temporal series: The following temporal series are chosen: a) Period 2005-2022 as it contains the whole set of data available. b) Period 2005-2007 as it covers the period pre-2008 financial crisis. c) Period 2008-2013, which is the 2008 financial crisis. d) Period 2014-2020 which is the post 2008 crisis and pre-COVID. e) Period 2020-2022, which is the COVID era.

2. Tuning parameters of the SOM: SOMs are regulated by three parameters: the lambda parameter, which controls the degree of the SOM, the initial weights of neural connections, and the topology of the SOM (Kohonen, 2013). As mentioned before, different values of these parameters can lead to different classifications for the same input data group. Hence:

- We perform multiple SOM trainings, varying the lambda parameter between 0.5 and 0.9.
- We use various grid dimensions: 8:1, 4:2, 2:4, and 3:3, where the i in the pair i:j represents the number of rows and j represents the number of columns.
- For each value of lambda and for each grid dimension, we conduct 1000 different simulations, with each simulation initializing the initial set of weights randomly.

3. Similarity matrix generation: When the SOM maps two categories to the same grid node, it indicates that the time series of both categories are similar. In each simulation, we calculate the number of times each category is mapped to the same grid node as any of the other categories. Finally, we obtain a similarity matrix representing the percentage of times each category A has been mapped to the same grid node as category B. This matrix will be symmetric, with all elements on its main diagonal having a value of 100%, and, for example, if the matrix cell corresponding to coordinates (1-2):(50:99) had a value of 75%, it would indicate that in 75% of the simulations, categories 1-2 and 50-99 have been mapped by the SOM to the same grid node. The higher the value of the cell matrix, the higher the similarity between the corresponding time series of the categories.

A similarity matrix is obtained for each lambda value, each selected temporal period in point (1.1) and each gris topology. Since the dataset and generated similarity matrices are extensive to be presented in this section, we only include the similarity matrices

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Table 1. Similarity Matrix for lambda=0.5 period 2008-2013 topology 3×3

	2008-2013 lambda=0.5							
	0-0	**1-2**	**3-5**	**6-9**	**10-19**	**20-49**	**50-99**	**>100**
0-0	100	100	100	100	0	0	0	0
1-2	100	100	100	100	0	0	0	0
3-5	100	100	100	100	0	0	0	0
6-9	100	100	100	100	0	0	0	0
10-19	0	0	0	0	100	100	100	100
20-49	0	0	0	0	100	100	100	100
50-99	0	0	0	0	100	100	100	100
>100	0	0	0	0	100	100	100	100

Table 2. Similarity Matrix for lambda=0.8 period 2008-2013 topology 3×3.

	2008-2013 lambda=0.8							
	0-0	**1-2**	**3-5**	**6-9**	**10-19**	**20-49**	**50-99**	**>100**
0-0	100	100	0	0	0	0	0	0
1-2	100	100	0	0	0	0	0	0
3-5	0	0	100	0	0	0	0	0
6-9	0	0	0	100	0	0	0	0
10-19	0	0	0	0	100	0	0	0
20-49	0	0	0	0	0	100	11	0
50-99	0	0	0	0	0	11	100	0
>100	0	0	0	0	0	0	0	100

Table 3. Similarity Matrix for lambda=0.5 period 2020-2022 topology 3×3.

	2020-2022 lambda=0.5							
	0-0	**1-2**	**3-5**	**6-9**	**10-19**	**20-49**	**50-99**	**>100**
0-0	100	100	100	19	19	19	19	71
1-2	100	100	100	19	19	19	19	71
3-5	100	100	100	19	19	19	19	71
6-9	19	19	19	100	100	100	100	46
10-19	19	19	19	100	100	100	100	46
20-49	19	19	19	100	100	100	100	46
50-99	19	19	19	100	100	100	100	46
>100	71	71	71	46	46	46	46	100

Table 4. Similarity Matrix for lambda=0.8 period 2020-2022 topology 3×3.

	2020-2022 lambda=0.8							
	0-0	**1-2**	**3-5**	**6-9**	**10-19**	**20-49**	**50-99**	**>100**
0-0	100	100	0	0	0	0	0	0
1-2	100	100	0	0	0	0	0	0
3-5	0	0	100	0	0	0	0	0
6-9	0	0	0	100	0	0	0	0
10-19	0	0	0	0	100	81	0	0
20-49	0	0	0	0	81	100	0	0
50-99	0	0	0	0	0	0	100	0
>100	0	0	0	0	0	0	0	100

for the periods 2008-2013 and 2020-2022, lambda values of 0.5 and 0.9 and grid topology 3x3 in Tables 1 to 4.

The results in the rest of the temporal intervals analyzed are similar to what is observed in Tables 1 to 4. It can be observed that for small values of the lambda parameter, the SOM clearly distinguishes between the performance of small-sized companies and large-sized companies. As the lambda parameter increases, the SOM tends to segregate each category of companies and classify them individually, except for the category of 0 employees and 1-2 employees, which are consistently classified together. This suggests that, overall, the performance reflected by the analyzed data aligns with existing studies based on the companies' size (Cader and Leatherman, 2011; Dörr et al., 2022; OECD, 2021; Titus, 2004; World Bank, 2019). Additionally, it shows that the categories chosen are independent of each other, and thus, the data chosen for our analysis is valid, and it adequately models the Spanish market from the perspective of company survival during times of crisis. For the Spanish market, the boundary between large and small companies, in terms of their performance, appears to be around 10 employees (the Spanish market is not characterized by the dominance of large companies).

4.2. Seasonal decomposition analysis

Once we have verified the suitability of initial data stratification, we can perform the multiplicative seasonal decomposition of the original data series.

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The goal is to obtain a graphical representation of these series that visually highlights the different trends experienced by each of the analyzed categories in the previous section.

In multiplicative seasonal decomposition, the equations used to obtain the components of trend (T), seasonality (S), and residuals (R) from the original data (Y) are as follows (Box et al., 2015; Hyndman and Athanasopoulos, 2018):

Trend (T): The trend is calculated using an exponential smoothing (Holt-Winters): $T(t) = k * Y(y) + (1 - k) * T(t-1)$.

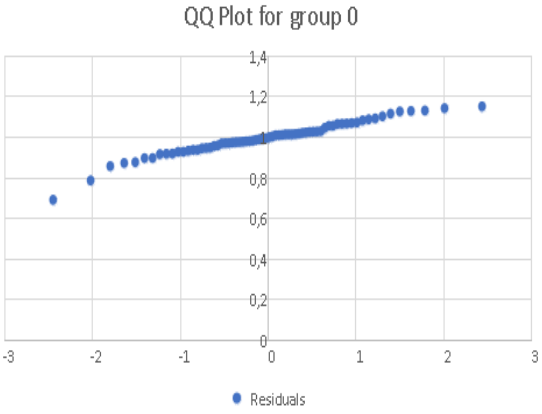
Seasonality (S): Seasonality in the multiplicative approach is obtained by dividing the original series by the estimated trend: $S(t) = Y(t) / T(t)$.

Residuals (R): They can be obtained by subtracting the trend (T) and seasonality (S) from the original series (Y): $R(t) = Y(t) / (T(t) * S(t))$.

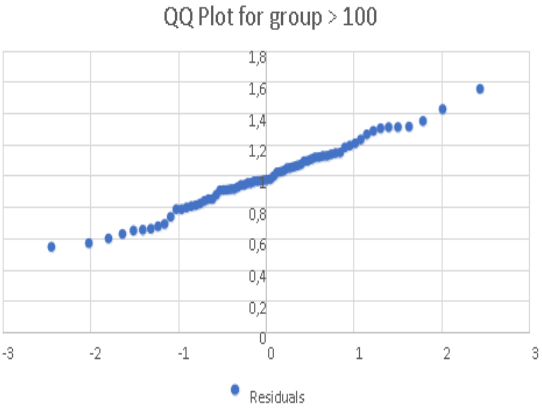
Figure 3. displays the trends obtained for each of the data series.

The goodness of the decomposition can be verified by analyzing the residuals' QQ plots (Figure 4 – companies with zero employees and Figure 5 – companies with 100 employees). The residuals form straight lines intersecting at (0, 1), meaning that they follow a normal distribution. Similar results were obtained for the remaining categories.

This indicates that the model fit is appropriate, and the trends presented in Figure 3 are valid.



Figures 4. Residuals QQ plot for category 0.



Figures 5. Residuals QQ plot for category 100.

The chart in Figure 3 reveals that, in the Spanish market, small businesses exhibited better performance than larger enterprises prior to the 2008 financial crisis. Furthermore, large companies were affected

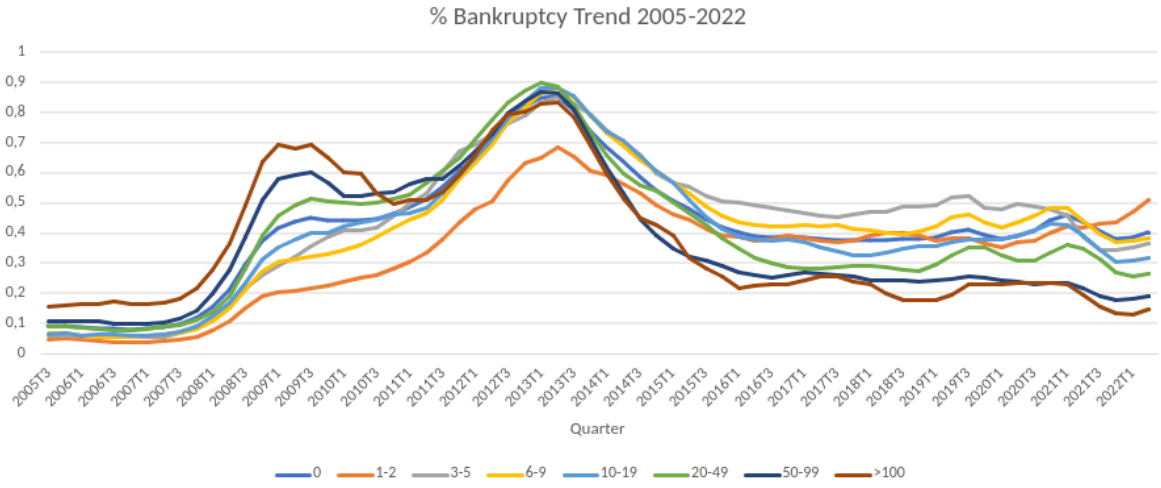


Figure 3. Bankruptcy seasonal decomposition 2005 - 2022.

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earlier and more severely by the 2008 financial crisis. However, starting in 2014, the performance of larger companies has been notably better than that of small businesses, which have never been able to regain their pre-2008 financial crisis performance. Additionally, they have been much more profoundly impacted by the COVID crisis.

5. The 2008 Financial and COVID-19 Crisis: Challenges for the Spanish SMEs

This section focuses on the challenges faced by Spanish SMEs across different economic periods from 2007 to 2022. Initially, we outline challenges before the 2008 financial crisis, followed by competencies aiding survival during the crisis, challenges in the 2015-2019 period, and the consensus on post-COVID-19 challenges.

The pre-2008 challenges for Spanish SMEs, identified by Camisón-Zorzona and de Lucio-Fernández (2010), include internationalization, business organization, financing access, innovation, and production efficiency enhancement. The 2008 financial crisis originated from a US housing market bubble (Acharya et al., 2009; Jickling, 2009; Larissa-Margareta et al., 2009), and profoundly impacted Spain (Ortega and Peñalosa, 2012). Real estate and construction suffered, leading to bankruptcies and job losses (Betrán and Pons, 2017; Kapelko et al., 2017; Ortega and Peñalosa, 2012). Financial institutions faced crises that affected lending activities (Betrán and Pons, 2017). Unemployment surged, altering consumption patterns and impacting export-oriented industries. Academic consensus on 2008 crisis survival factors includes strong financial management (Attig et al., 2016; Corbet, 2016; Demırhan and Anwar, 2014; Tong and Wei, 2011), income diversification (Brighi and Venturelli, 2014; Carroll and Stater, 2009; Vallascas et al., 2012), adaptability (Buheji, 2018; Meléndez, 2012; Pal et al., 2012), brand strength (Giannarakis and Theotokas, 2011; Grundey, 2009; Raithel et al., 2010), financing access (Banco de España, 2009; Chor and Manova, 2012; Demirgüç-Kunt et al., 2020; Sannajust and others, 2014), and cost reduction (Fabiani et al., 2015; Su and Tang, 2016). Innovation emerges as a vital factor in transcending crises. Spanish SMEs faced significant 2008 crisis impacts, with the Spanish Central Bank noting heightened deterioration between 2008 and 2012 (Menéndez et al., 2017). Despite challenges, SMEs consistently outperformed large firms, with marginal differences in liabilities.

In 2015 (CEDEC, 2015), challenges for Spanish SMEs were identified as internationalization, financing, and digital-focused innovation. OECD (Organization for Economic Co-operation and Development) emphasized SMEs' role in low-productivity sectors, advocating digitalization for productivity boost and global integration.

In 2019, before the COVID-19 pandemic, the OECD (OECD, 2019) remarked the following points regarding the SMEs in Spain: a) They create most of the jobs in low-productivity and low-wage sectors. b) Innovation is crucial for boosting productivity, and digitalization offers SMEs new opportunities to be part of the new production revolution. c) Digitalization can also help SMEs integrate into global markets and global value chains. d) SMEs need to better prepare for the digital transition. e) Achieving these goals requires innovative policy action and a whole-of-government approach. By 2020, the COVID-19 pandemic triggered a severe recession. Lockdowns caused economic contractions, escalating unemployment, and increasing fiscal deficits.

In a study conducted in December 2021 by SAGE (2022), the ability to adapt to change and the challenges derived from the COVID-19 pandemic have been strongly driven by the following factors: a) Customer-focused technology. b) Technology for internal processes. c) Development of new goods and services. d) Overhead cost reduction.

According to the report presented by the insurance company Hiscox in 2022 (Hiscox España, 2022), the main challenges to be addressed by Spanish SMEs are a) Hyperinflation and defaults, b) Supply chain crisis and geopolitical instability. The study also highlights the strategic challenges of SMEs in the Spanish market as: a) Digitalization, digital marketing, and opening new commercial channels through e-commerce. b) Innovation to move forward. c) Search for strategic allies. SAGE (2022) also mentions the increase in costs and liquidity problems as two of the main issues faced by Spanish SMEs.

Table 5 summarizes all the previous findings. It presents a comparison between the challenges and difficulties faced by SMEs identified in academic literature and by economic institutions and

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Table 5. Spanish's SME challenges evolution from 2007 to the present, according to scholars.

Pre 2008 Crisis	2008 Crisis Recovery	2014-2019 Challenges	COVID crisis Recovery
	Financial management		Financial management
Internationalization		Internationalization	
	Income diversification		Income diversification
Management and business organization	Adaptability and flexibility		Adaptability and flexibility
	Brand Strength		
Access to financing and capital	Access to financing and capital	Access to financing and capital	
Productivity and efficiency	Cost reduction		Cost reduction
Innovation	Innovation	Innovation	Innovation
		Digitalization	Digitalization

organizations during the 2008 crisis, the COVID-19 pandemic, and the period between both events. The concepts that pursue the same objectives according to the cited sources are presented in the same row. For example, productivity and efficiency aim for an improvement in the organization's costs, while management and business organization aim to enhance the organization's adaptability capacity.

Comparing post-2008 financial crisis and post-COVID scenarios in Table 5, commonalities emerge, notably digitalization as a new factor. Access to financing, a concern in the 2008 recovery, now affects only 14% of SMEs, signaling improved conditions. However, 2022 shows a decrease in companies reporting no financing obstacles, indicating an evolving financial landscape post-COVID. Notably, brand strength and reputation, absent in available studies, may be due to their substantial cost, possibly challenging for many SMEs. These insights highlight dynamic shifts in challenges and opportunities, emphasizing the evolving role of digitalization in the post-COVID SME landscape.

6. Discussion

It is well-known that there are differences in management and perception of the environment and associated risks between large corporations and SMEs (Mafimisebi et al., 2023). As we have discussed throughout the previous sections, the tendency of the Spanish market during the COVID-19 crisis can be explained based on this fact. The preceding sections have presented and analyzed a series of statistical data suggesting two facts: First, in the Spanish market, the survival of companies during times of crisis depends on the size of the company; Second, the type of crisis also influences the type of companies that survive it. Specifically, during the financial crisis of 2008, which was a liquidity crisis, larger companies experienced the impact of the crisis earlier and more pronouncedly than smaller companies. However, the market tendency during the COVID-19 crisis, which was a demand crisis, followed an opposite pattern: Large companies were significantly less affected by the crisis than SMEs.

Various international studies (Dörr et al., 2022; European Union, 2021; OECD, 2021) show that the COVID-19 crisis has had a highly unfavorable influence on SMEs, while large corporations have not only survived in better conditions but have also thrived and grown notably during this period. This conduct, in principle, is similar to the observed conduct in the Spanish market; however, upon deeper analysis, two notable differences between the two scenarios become apparent: In the Spanish market, there are scarcely any very large companies with a significant global market share, and these companies have minimal activity in the technological or pharmaceutical markets (BMEX, 2024).

To seek an explanation for this phenomenon, a comparison is made for the Spanish market of the responses and conduct exhibited by large companies and SMEs during the financial crisis of 2008 and the COVID-19 crisis. The analysis of these two events suggests that, while large Spanish companies managed to learn and modify their conduct (at least partially) after the financial crisis of 2008, Spanish SMEs did not leverage those circumstances as much, and the modification of their practices and action patterns was not as profound as necessary.

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According to International Leaders UK (2023) the major challenges for SMEs in Europe in 2023 include competitive pressure generated by the ease of doing business and reaching new customers provided by the digital economy, talent attraction and retention, access to financing, digitization, cybersecurity, regulatory and normative systems, and sustainability. When we compare these points with those reflected in Table 5, we find only two common points: digitization and access to financing.

If we study Table 5, we can see that access to capital and sources of financing, surprisingly, does not appear in the reports and analyses regarding the situation of SMEs after COVID. According to Leyton (2021) and SAGE (2022) the reason for this is that the Spanish government's measures to ensure liquidity and access to financing in the Spanish market after the COVID crisis have been successful, and at present, Spanish SMEs do not encounter more problems than usual in this regard. It is worth noting, however, that this is not an exclusive issue of the Spanish market; both SMEs and large companies consider accessing national and European funds to be a laborious and complicated process that is not always worthwhile. It is important to point out that of all the points mentioned in Table 5, this is the only one over which companies have no control, and it does not depend on them to improve it.

Regarding digital transformation, from 2016 onwards, there has been a strong institutional push in Europe to initiate what is known as the digital transformation. Just as ease of access to financing is not within the control of companies but rather a market condition, digital transformation has not been a natural movement for companies in Europe. Instead, it is occurring due to institutional pressure and the development of the 2030 agenda (González-Varona et al., 2021; Mićić, 2017).

Table 5 shows that Spanish SMEs have essentially been facing the same issues since at least the second half of the 2000s. We have observed that there are certain challenges identified in the European context that do not appear in the analyses conducted in the Spanish market, and conversely, the challenges identified in the Spanish market do not appear in the analysis for the European market (except for access to financial resources and digitization, but we have argued about the exceptional nature of these two points). All of this leads us to conjecture that the situation of Spanish SMEs is due to endemic conditions in the Spanish economy and society, directly relating to the question that initiates this section: Referring to Table 5, Could the contrast in how large and small companies address these aspects account for the observed divergence in their performance following the 2008 crisis? Is it possible that, in the Spanish market, large companies have improved their resilience capacity after the 2008 crisis, while small companies have not learned enough from that crisis?

If we focus on the innovation section, we find that 85% of SMEs and 77% of large companies in Spain believe that there is not enough support for innovation. When comparing investment in innovation between large and small companies, 26% of large companies increased their innovation investment in 2020, while only 11% of SMEs did the same (Leyton, 2021). According to data provided by the INE, this difference is even more pronounced, as 38% of companies with over 250 employees invested in innovation, compared to 25% of companies in the range of 50 to 250 employees, and only 10% of companies with 10 to 49 employees did the same. In the period 2009-2020, the difference between large companies investing in innovation compared to SMEs doing the same increased by 3.9% Spanish National Insitute of Statistics, 2023).

Regarding competitiveness, Eurostat statistics for the entire EU in the period between 2011 and 2018, Russo et al. (2022) show that the competitiveness of SMEs (i.e., companies with fewer than 250 employees) significantly declined compared to that of large enterprises. Three key indicators illustrate this trend: 1) The increase in turnover was eight times smaller for SMEs than for large enterprises, resulting in a significant loss of market share for SMEs. 2) Almost all new jobs were created by large enterprises, leading to a decrease in the SMEs' share of total employment from 67% to 63%. 3) The value added, reflecting income from operations, increased by 11% in large enterprises but remained stagnant for SMEs. Consequently, SMEs represented 52% of the value added in 2018, down from 58% in 2011.

Financial management in large companies and small businesses (SMEs) presents significant differences due to disparities in size, organizational structure, access to resources, and financial needs. It's important to note that these deficiencies can vary by industry and region, and not all SMEs face the same challenges. However, these are some common financial challenges that SMEs encounter compared to large enterprises (Deloof, 2003; Durnev and

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Kim, 2005; Ongena et al., 2013). 1) Limited Access to Capital: SMEs often face difficulties in accessing adequate sources of financing. Large enterprises typically have more options and resources for obtaining funding through capital markets and issuing stocks or bonds. 2) Risk Management: SMEs sometimes lack the resources and expertise for robust risk management. Large enterprises generally have dedicated departments for financial risk management and hedging strategies. 3) Limited Financial Information: SMEs may have less sophisticated accounting systems and fewer resources for generating detailed financial reports. Large enterprises usually have more advanced financial information systems and greater capacity for financial analysis. 4) Limited Diversification: SMEs often heavily depend on a small number of customers or products, making them more vulnerable to market fluctuations. Large enterprises typically have a greater diversification of products and clients. 5) Limited Human Resources: SMEs may struggle to attract and retain qualified financial talent. Large enterprises often have larger finance departments and can offer more attractive compensation packages. 6) Limited Strategic Planning: SMEs may lack resources for long-term financial strategic planning. Large enterprises frequently have dedicated strategic planning departments. 7) Treasury and Liquidity Management: SMEs may face challenges in effectively managing liquidity and treasury, which can lead to cash flow issues. Large enterprises usually have more robust cash management processes. 8) Limited Negotiating Power: SMEs may have less negotiating power regarding financial agreements with banks and suppliers compared to large enterprises. 9) Limited Economies of Scale: SMEs often have higher unit costs due to a lack of economies of scale compared to large enterprises. 10) Regulatory Compliance: SMEs may struggle with regulatory compliance due to a lack of resources and expertise in this area, while large enterprises often have dedicated compliance departments.

According to the Spanish Family Business agency (Instituto de la empresa familiar, 2023), in the Spanish market, 89% of the enterprises are family enterprises, only 52% of the CEOs have a university education, 61% of the companies are directed by one single person, and the skills and knowledge of the candidate are relevant for selecting a CEO only for the 19% of the companies. These numbers, in combination with the SMEs' financial management issues, suggest that financial management in Spanish SMEs is improvable.

The data and discussion presented in the paper suggest that Spanish SMEs and large companies recurrently face the same stressors and challenges, which sometimes become more pronounced but seem to always be present. However, they have addressed them from different perspectives. SMEs have taken a business continuity approach, while large companies has address them from a resilience perspective following the three phases (absorption-adaptation-learning) model.

The various publications and reports available over the past years indicate that these problems are well known both by the government and the companies themselves (Camisón-Zorzona and de Lucio-Fernández, 2010; Ortega and Peñalosa, 2012; CEDEC, 2015; SAGE, 2022). From these same reports, we deduce that over the years both the companies and the respective governments have developed practices and policies aimed at correcting them. However, the data also indicates that for SMEs, the practices have not had a significant structural impact, as the problems remain similar over the years. This suggests that the issues have been addressed from a perspective closer to business continuity, which is more short-term and focused on maintaining and securing critical functions, rather than organizational resilience, which, as we have previously discussed, aims for organizational transformation through the incorporation of knowledge acquired during times of crisis.

Various studies (Duchek 2020; Mokhtarifar et al., 2024; Garrido-Moreno et al., 2024) show that when companies can deploy the process of absorption-adaptation-learning, they achieve structural improvements and adaptations that enable them to more effectively manage and navigate highly disruptive situations, which has not been the case for SMEs.

The presented data suggest a different pattern for large companies, who have been able to deploy, with varying degrees of success, the resilience process in its three phases (absorption-adaptation-learning).

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By jointly analyzing the trends in bankruptcy evolution after the 2008 financial crisis and the major problems previously mentioned, for large companies in Spain, we can conclude that they have somehow managed to deploy the complete cycle of organizational resilience (absorption-adaptation-learning) that would have allowed them to capitalize on and leverage the lessons provided by the 2008 financial crisis when dealing with the COVID-19 pandemic.

7. Conclusions and future work

The purpose of the article was to discern whether the evolution of the number of companies in insolvency across different enterprise categories (based on the number of employees) in Spain can be explained from the perspective of organizational resilience. From this premise, three questions arise: 1) Does the size of a company influence its survival capacity during any crisis? 2) Does the type of crisis influence the type of companies that survive? 3) Can the evolution of the number of companies in insolvency across different enter-prise categories (based on the number of employees) in Spain be explained from the perspective of organizational resilience?

In the paper, we have provided the data and references we consider necessary to answer these questions appropriately.

Does the size of a company influence its survival capacity during any crisis?

According to the statistical data available, the size of a company does appear to be related to its survival capacity during a crisis of disruptive magnitude. There is not enough information to extend this conclusion to crises of a lesser scale.

Does the type of crisis influence the type of companies that survive?

The type of crisis may have some influence on the type of companies that survive it. The data we have covers the years 2005 to 2023, which includes only two crises of disruptive magnitude (the 2008 financial crisis and the COVID-19 crisis), so extending this conclusion on a general level cannot be done.

Can the evolution of the number of companies in insolvency across different enterprise categories (based on the number of employees) in Spain be explained from the perspective of organizational resilience?

The response of the Spanish market during the COVID-19 crisis can be generally explained based on the antecedents and response of Spanish companies to the 2008 financial crisis. In our view, this provides evidence that supports theoretical models conceptualizing organizational resilience as a dynamic process consisting of three phases: 1) Absorption. 2) Adaptation. 3) Learning. Above all, the ability to fully deploy the resilience process increases the chances of being resilient in the future.

Additionally, we have found indications that there may be a positive correlation between the degree of implementation of the digital economy and the recovery capacity after a highly disruptive crisis such as the COVID-19 crisis.

Limitations of the study: The statistical data available for this study is neither exhaustive nor complete, and it would be beneficial to have data from other countries with economies of similar size and dynamics to assert the presented conclusions more rigorously.

Future work: We understand that the results presented are significant when dealing with highly disruptive events, such as the 2008 and COVID-19 crises. It would be interesting to extend the analysis of the research questions posed to more routine situations where the nature of events is not as dramatic, and therefore, they do not affect as many organizations simultaneously but still compromise the stability and viability of some. To conduct this work, more information is needed, which can only come from the organizations themselves.

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