

Outcomes of firm resilience in wild card crises—Country, industry, and firm effects in the Covid-19 crisis

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ABSTRACT

In this paper, we examine to what extent external factors (country and industry) and internal factors (capabilities of firms) explain firm resilience outcomes during the first and toughest months of a wild card crisis. Our study uses multivariable regressions on a sample of 1,180 firms. Using evidence from a survey of 58 countries and 17 industries, our results show that, contrary to the mainstream, external effects play a more significant role in explaining resilience outcomes than internal effects. They also highlight the important role of firms' adaptive capabilities in the initial phase of crises. The study contributes to the existing literature by shedding light on the importance of resilience and on the relative influence of internal and external factors in predicting resilience outcomes in the face of a global shock. The paper highlights the need for further research into performance variance in the very short run when firms face a wild card situation. It also discusses implications for governments and firms in improving their resilience capabilities and emphasizes the importance of ensuring that aid reaches small firms and that managers prepare firms with excess liquidity for times of crisis.

1. Introduction

One of strategic literature's central issues is explaining differences in firm performance [1,2]. Why some companies are more profitable, grow faster, or withstand more than others, and what effects the industry or country has on firm performance continue to be core questions in the field of strategic management [3]. Answering this question not only enhances the foundation of academic knowledge but also furnishes pertinent information for practitioners and policymakers.

Rumelt [4] found that stable business-unit effects were six times more important than stable industry effects in explaining returns dispersion. Since Rumelt's seminal study, the dominant stream in the literature has assumed that internal factors are the primary cause of differences in firm performance, explaining more than 50% of the variance [5].

Although the mainstream supports the thesis of the supremacy of internal factors, some studies recognize that the random error in explaining the variance in firm performance is quite high, so the question remains open [6].

One of the causes of the controversy arises from distinct methodological approaches [7], especially the samples analyzed [6]. On the one hand, the period in which the study is conducted is crucial, as it is not trivial for the time series used as a sample in analysis to be limited to a growth or recession phase [6]. Most studies (reviewed in the next section) analyze periods of growth/stability or long periods where two or more economic cycles are mixed. In these studies, it is difficult to identify the external and internal effects in the different phases and sub-phases of the economic cycle (for example, in the recession phase of a crisis). On the other hand, some works

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focus on economic recessions of the last 50 years, but there are no systematic studies that examine the variance in outcomes of different types of external crises. For example, Bamiatzi *et al.* [8] found that firm effects strengthened during the 2009 Great Recession, whereas industry effects became weaker, as well as country main and interaction effects, particularly among the emerging economies. Another source of controversy stems from the possibility that the crisis effects may change over time [7].

According to the literature, there are several types of exogenous shocks [9] (pag. 4)¹: financial/economic shocks, natural disasters, epidemics, armed conflicts, political violence, and societal insecurity [10]. These shocks can generate four types of crises based on their predictability and the ability to influence their outcomes [11]: conventional crises (easy to predict and influence), unexpected crises (unpredictable but easy to influence), intractable crises (easy to predict but difficult to influence), and fundamental crises (unpredictable and difficult to influence). Fundamental crises include wild cards [12], black swans [13], and extreme contexts [14]. These crises are caused by unpredictable shocks of huge magnitude and far-reaching impact [15] that may exceed organizations' capacity to prevent them [14].

Different types of shock/crises vary in their duration, their capacity to destroy physical assets, their short- and long-term impacts on the economy (GDP, unemployment, etc.), and their geographical reach, affecting the withstand and recovery capability of firms in different ways [10]. Wild card crises, when they are global in scope [16] (abstract),² such as COVID-19 (henceforth, COVID), pose the greatest challenge [17]. Since this type of crisis is new, little is known about what drives firms' outcomes [15].

Having evidence of this phenomenon is important because it allows for attributing responsibility to those who, through external and internal factors, influence the achievement of resilience during the crisis and the best possible performance in its management. In crises like COVID, when external factors are as important or even more important than internal ones, the responsibility of policymakers in helping firms withstand it is as great or greater than that of their managers.

This article examines the influence of external and internal effects on firm outcomes in the first and toughest stage of the COVID pandemic, which was the last wild card crisis of a global nature, due to its global scope, intensity, and the lack of foresight [14,17]. We focus on the first phase of the crisis, the recession phase (the first six months of the pandemic), because this was the most intense stage of the crisis, and because it has been shown that in the early stages of an external crisis, good performers generally prove to be less vulnerable, that is, more resilient [18,19,20], meaning that firms that withstand the recession better emerge from the crisis in better conditions.

COVID severely impacted economies in most parts of the world. In 2020, the year of massive lockdowns, world GDP fell by 2.9%, and the unemployment rate rose from 5.5% to 6.9% (Fig. 1). The impact of the COVID pandemic on economic activity and employment varied by country and sector but also by firms' ability to adapt.

The first year of the epidemic affected countries unequally, depending on their demographics (age and spatial distribution), development, the response of their healthcare systems, and the special measures taken by their governments. The countries most affected by the epidemic imposed confinement and mobility restrictions on the population. In response to the crisis, countries activated support initiatives to protect employment and firms, such as supplementing employee salaries, deferring or reducing taxes, and providing financial support (soft loans or credits), but there were considerable differences in the extent and intensity of support [22,23,24].

Industries linked to people's mobility, such as restaurants and hotels, suffered the most from the impact of the crisis [25]. Others, like information technology service companies, increased their activity due to remote work [26].

In each country and industry, firms faced the 2020 shock with different resources and capabilities. As a result, their resilience outcomes were also different.

The literature has identified several key internal characteristics. One of the core features of firm resilience during crises is size [27,28]. In the face of crises caused by exogenous shocks, larger companies enjoy greater diversification of income and better access to human, technological, and financial resources, as well as government support, than small and medium enterprises (SMEs) [10].

Firms' experience in past crises is also an important factor in the ability to withstand crises derived from external shocks because a deeper familiarity with management under shock conditions can benefit crisis management and bolster preparedness for future crises [15]. For example, Tosun *et al.* [29] examined how firms' exposure to prior disastrous events influenced their performance during the coronavirus crisis. They found that firms' prior exposure to the 9/11 terrorist attacks partly 'immunized' them against the consequences of the COVID crisis in the very short run.

In line with this, the ability of family firms – which account for two-thirds of businesses around the world [30] – to accumulate experience from past crises in the form of organizational learning [31] has been highlighted as one of the main explanations for business resilience [15,27]. In this type of firm, the agency problem between owners and managers is reduced, since the board and top management team tend to have a long-term focus on non-financial objectives (e.g., reputation), and there is more continuity in the human factor, which allows organizational memory to develop more effectively.

Financial capability before and during a crisis also plays a significant role in firms' resilience, as demonstrated in several studies (e.g., [32,33]).

Finally, the ability to adapt to the new situation created by the crisis through a combination of entrepreneurial and market-oriented activities can help firms resist [10].

¹ "A sudden event beyond the control of the authorities that has a significant negative impact on the economy" ([9]: 4).

² According to the World Bank [16], before the COVID crisis, "the world economy has experienced four global recessions over the past seven decades: in 1975, 1982, 1991, and 2009. During each of these episodes, annual real per capita global gross domestic product contracted, and this contraction was accompanied by weakening of other key indicators of global economic activity. The global recessions were highly synchronized internationally, with severe economic and financial disruptions in many countries around the world."

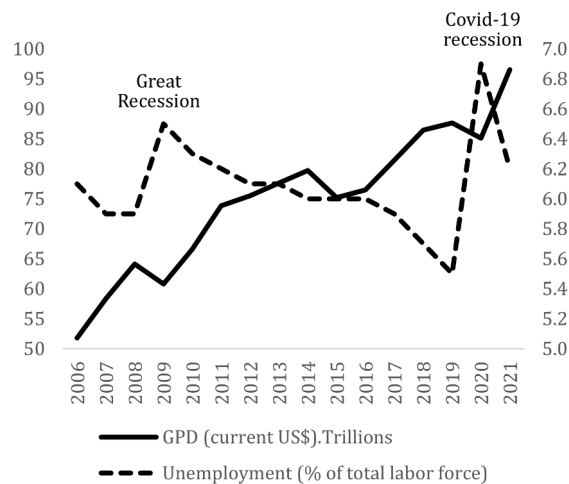


Fig. 1. World GDP and unemployment (2006–2021). Source: Authors' calculations based on World Bank [21] data.

To summarize, the purpose of this paper is to investigate the extent to which external factors (country and industry) and firm factors explain the resilience outcomes of firms during the first and most challenging months of the coronavirus pandemic. Our study uses multivariable regressions on a large sample of 1,180 firms from around the world, with data obtained from an international survey. The results show that country and industry effects are more significant in explaining resilience outcomes than firm effects. They also demonstrate the important role of firms' adaptive capabilities and financial slack in the recession phase.

This paper contributes to the performance and organizational resilience literatures by showing that the impact of external factors was key in the first and hardest phase of the crisis, the recession phase. Our study contributes to the empirical literature by suggesting that sales growth is the most effective measure of resilience in the short term, as opposed to more traditional measures, such as return on assets. It also highlights the necessity of studying the sources of performance variance in shorter periods instead of performing the usual analysis based on annual or multi-year data.

We expect to contribute to practitioners by increasing their awareness of the need to prepare firms for unforeseen shocks, which is accomplished with redundant financial resources and adaptive capabilities. We contribute to policymaking, as well, by recommending shock measures able to reach SMEs, the weakest firms in this type of crisis.

The remainder of the article is organized as follows. In the next section, we discuss the relevant literature and outline our theoretical hypotheses. The third section presents the methods. In the fourth section, we present the findings. And finally, in the fifth section, we discuss the results and conclude.

2. Literature review and hypotheses

The research question underlying this work is what explains differences in firm performance. Our objective is to study the influence of external and internal factors on firm performance during the recession phase of wild card crises.

In this section, we explain what we mean by firm performance, firm resilience, and resilience outcomes, our dependent variable, and review the literature that addresses our research question and objective.

2.1. Performance, resilience, and outcomes

Scholars view firm performance as a multidimensional construct that essentially describes a firm's ability to be profitable and competitive, to adapt, and to survive. Combs *et al.* [34] state that organizational (or firm) performance can be dimensionalized into accounting returns, stock market, and growth measures. Butler *et al.* [35] suggest that measures of survival, such as Altman's Z score, profitability (EBIT over assets, ROA, ROI, ROIC, and TSR), and sales, allow capturing its dimensionality. When examining firm performance variance, most papers use ROA as a firm outcome [5], despite its considerable limitations [36].

In the strategic management literature, firm performance in the context of acute exogenous shocks is described as the ability of a firm to absorb and recover from shocks [37], i.e., the ability to be resilient. A few decades ago, firm resilience was based on stability; nowadays, it depends on rapid and effective adaptation to change ([38]: 28).

According to the process-based view, resilience can be viewed as a process with three phases: pre-adversity, adversity, and post-adversity [39]. In each of them, some actions are developed: anticipation and preparation; sensemaking, absorption, adaptation, and coordination; and learning and transformation, respectively. Within the second phase, two fundamental sub-phases can be distinguished: setback or recession, and bounce back or recovery [39]. In this paper, we will focus on the recession phase (Fig. 2).

On the other hand, drawing on the dynamic-capabilities theory, we assume that rapid and effective adaptation is based on three main activities: sensing (quickly perceiving the nature and extent of the shock), seizing (firm's ability to respond to the opportunities and threats identified through sensing), and transforming (filling capability gaps that arise when a company is exposed to a shock; pri-

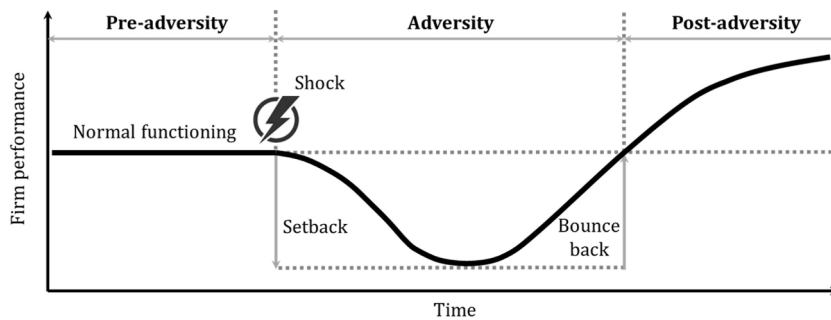


Fig. 2. Organizational resilience as a process. Source: Adapted from Su and Junge [39].

oritizing objectives; “tuning up” the company’s culture, organization, and routines, etc.) [40,38]. These three activities are crucial in the disruption or recession phase and depend on internal and external factors [32].

Firm resilience, or more generally, organizational resilience, is a latent variable that cannot be directly observed; that is why past research has inferred it indirectly from its impact on firm (resilience) outcomes, such as variation in stock prices or in sales ([41]: 1434). Many researchers consider firm resilience as the desired outcome, with a variety of outcome variables [39]. In studies on resilience in recessions, it is common to use variation in sales [42,19,43,44], stock prices [41], profitability [45], employees [32], and firm survival (e.g., [46,47]), although survival alone provides limited insight into companies’ performance during adverse events [39].

Resilient firms overcome crises. This means that resilient firms are able to survive crises and recover lost performance. Although it is not a necessary condition, firms may be required to build resilience in the pre-adversity phase (e.g., having contingency plans or extra financial capacity). During the setback sub-phase, resilience is necessary (e.g., the restructuring of the firm or its search for new markets), although it is not sufficient by itself. And during and after the recovery sub-phase, resilience must be demonstrated, it being a necessary and sufficient condition (e.g., with a more robust competitive advantage). Different outcomes can be measured in each phase. In this article, we focus on resilience in the disruption or recession sub-phase, where outcomes such as sales are a key variable [42,19,43,48]. This is even more relevant in the context of the COVID crisis since it leads to a revenue shock [49].

2.2. The role of internal factors vs external factors in explaining firm performance

The question of whether firms control their destiny or are subject to external factors has been a topic of debate among scholars for decades, with industry being the most extensively studied external factor [50]. The industry effect suggests that industry is the main driver of firm performance, while the firm effect emphasizes firm-specific aspects [7]. Because of globalization, the influence of the country in which firms operate has also been studied in the last few decades, known as the country effect [51].

According to classical industrial-organizational economics (see, e.g., [52]), and Porter’s positioning school [53,54], industry influence on firm performance can be attributed to factors such as industry concentration, growth rate, capital intensity, product differentiation, and barriers to entry, exit, and mobility. On the other hand, according to resource-based theory [55], firm-level factors such as firm age and size, ownership, slack of resources, strategy, and firm capabilities also play a crucial role in determining firm performance. Likewise, country-level factors such as the quality of governance, GDP growth, openness, wealth, and culture can significantly influence firms’ performance [56] and their resilience to crises [39].

The effects of shocks such as the COVID pandemic on business performance vary greatly from company to company. They depend on various external and internal factors that affect companies’ ability to adapt to the crisis. Among the external factors, those associated with the country and the industry stand out, along with those related to governments adopting lockdowns, restrictions, and support measures for companies, as well as the degree to which the crisis affects the dynamics of each sector [14,57,58,10]. Among the internal factors, the literature highlights organizational resilience (e.g., [59]), i.e., the ability of companies to survive, adapt, and recover fast from external shocks. External and internal factors determine the results achieved by firms, i.e., the resilience outcomes [60].

The COVID pandemic has negatively affected economic activity through both demand-side and supply-side effects [61]. The consequences of COVID have adversely affected firms in industries related to people’s mobility. For example, in the early months of the crisis, compulsory restrictions and consumer behavior changes negatively impacted demand and supply in the leisure and hospitality sectors [61]. The intensity of the disruption impact in each industry is significant because the resilience of firms during the recession sub-phase is a critical business factor for successfully overcoming the recovery sub-phase of a crisis [44]. At the country level, infection rates and government measures, such as lockdowns and support for firms and individuals, have played a key role [62].

Pre-COVID empirical evidence has shown that these effects—country, industry, and firm—all explain firm performance heterogeneity (see the literature reviews in Esho and Verhoef [50]; and in Etiennot *et al.* [63]). In the previous research, internal factors have been found to have a greater influence ([50,63,64]), both as transient and permanent influences [63]. Nevertheless, temporary impacts can change under shocks such as the recent pandemic, which is why we argue that country and industry can play an important role in firm crisis management.

2.3. Permanent influences on firm performance

The resource-based view theory of the firm states that a company's performance depends on its ability to develop and effectively use valuable, rare, inimitable, and non-substitutable resources and capabilities that it possesses [55]. It is now well established that firm effect is the most relevant source of variation in performance in the long run (Esho and Verhoef [50] reviewed this literature). However, it is also accepted that in some sectors of the economy, industry influence may be greater than the influence of firm factors [65].

The first study to provide robust empirical evidence of the prevailing contribution of firm factors to the explanation of variance in performance over several years was Rumelt's (1991)[7]. This author analyzed the performance of 1,774 business units from 1974 to 1977. He identified that the firm effect was the most important source of variation, accounting for 46.37% of the return's total variance. The industry effect was responsible for 8.32% of the total variance.

This study was followed by others who also concluded that internal factors were the main explanation for performance heterogeneity over several years [7]. For example, the meta-analysis recently carried out by Vanneste [5] found that the average effect sizes for variance measures are 8% for the industry and 50% for internal firm components. Table 1 presents a selection of variance decomposition studies with estimations of the effects. The consensus is that internal factors have the greatest explanatory power, followed by industry and country effects. This applies to studies that include or exclude the years of the most recent global recessions (i.e., 1975, 1982, 1991, and 2009; [16]). The impact of specific years is also tested in most studies, but this effect is the least significant.

Hence, prior research strongly supports the generally accepted hypothesis that internal factors are the primary explanation for the heterogeneity of results if multi-year periods are considered.

2.4. Influences on resilience outcomes in the crisis recession phase

The year effects reported in Table 1 capture temporary impacts on company performance in some years, normally associated with the macro-economic situation [79]. Studies that include the year effect in their models found that it only contributed a small percentage to variance in profitability. Some studies that measure performance through sales, such as Brito and Vasconcelos' (2009) [64], found a moderate year effect in annual growth rates, accounting for 1.4% of the total variance. According to these authors, more than 40% of the total variance in revenue growth rates corresponds to firm aspects and not to industry, country, or macroeconomic conditions prevailing in specific years. It follows that macroeconomic conditions do not account much for performance differences among firms. Esho and Verhoef [50] argue that what truly matters is how firms respond to various macroeconomic conditions, which is accurately reflected in the firm effects.

A review of studies covering several years that included global recessions (Table 1, panels B and C) indicates that macroeconomic conditions have no significant effect on performance differences between firms (year effect). The question arises, however, whether macroeconomic conditions would significantly affect firm performance differences if firm outcomes were only assessed in recession

Table 1

Variance decomposition results of selected firm performance studies.^a.

Study	Country data - Years covered	Firm	Industry	Country	Year
<i>A. No global recessions included</i>					
Bamiatzi et al. [8]	Global 2005–2007	87.31	9.74	3.22	
Bruto and Vasconcelos [64] ^b	Global 1994–2002	42.10	7.30	10.00	1.40
Elango and Wieland [56]	Global 2001–2007	35.40		11.30	6.60
Carvalho et al. [66]	Latin America 1998–2007	29.00		11.50	
Goldschmidt et al. [67]	Global 1995–2004	32.70	2.50	3.20	
Hirsch and Schiefer [68]	Europe 1996–2008	34.30	1.30	3.50	2.20
Hirsch et al. [69]	Europe 2004–2008	40.20	0.40	1.80	0.90
Ketelhohn and Quintanilla [70]	Central America 1999–2003	44.70	17.50	5.10	
Makino et al. [71]	Global 1996–2001	31.40	6.90	5.50	0.10
McGahan and Victor [72]	Global 1993–2003	17.90	15.70	2.60	0.60
Tong et al. [73]	Global 1997–1999	21.60	7.30	2.40	0.20
Average		37.87	7.63	5.47	1.71
<i>B. 1991 recession</i>					
Hawawini et al. [74]	Europe 1989–1997	23.80	0.20	0.20	0.40
Hermelo and Vassolo [75]	Latin America 1990–2006	30.40	3.80	2.10	1.90
Average		27.10	2.00	1.15	1.15
<i>C. 2009 Great Recession</i>					
Bamiatzi et al. [8]	Global 2008–2011	90.38	6.13	3.49	
Erkan et al. [76]	Global 2001–2011	36.70	23.30	10.20	
Esho and Adegbesan [77]	Africa 1997–2012	22.50	5.40	4.90	
Fitza and Tihanyi [78]	Europe 2001–2013	40.20	4.10	1.00	0.60
Average		47.45	9.73	4.90	0.60

Note: Figures in percentage.

^a Further studies can be found in Esho and Verhoef [50] and in Wang and Coff [7]. Our selection includes only those that reported at least firm and country effects.

^b Calculated effects for the variance of the variation in sales. The authors also analyze the variance of the variation in assets, but the results are very similar.

Source: Adapted from Esho and Verhoef (2021: 874–875).

years. This issue is important because it has been shown that companies with better resilience outcomes during a recession phase (e.g., recession sales growth) continue to perform well at the end of the crisis [18,19,20,44].

Bamiatzi *et al.* [8] studied the relevance of firm, industry, and country effects on firm performance, particularly in adverse contexts such as the 2009 global economic crisis. They examined 15,008 firms in 10 emerging and 10 developed countries for the 2005–2007, and 2008–2011 periods and found that the firm effect becomes stronger under adversity, whereas the industry effect and the country main and interaction effects become weaker. According to these authors, “firm’s own fate is, to a great extent, self-determined; a reality that is even more pronounced during periods of extreme economic hardship” (p. 1448). In line with Bamiatzi *et al.* [8], Etiennot *et al.* [63] analyzed the variance in performance derived from permanent and transitory factors. They concluded that in the transitory, short-term component of abnormal performance, the firm-specific effect largely dominates other effects. Thus, given these results, one might conclude that the general hypothesis on the dominance of the firm effect over the country and the industry effects holds for the recession phase in wild card crises as well.

2.5. Effects of the COVID recession

The world economy was short-circuited by this wild card crisis. As Redek *et al.* [48] explain, the 2020 pandemic affected economies and firms through three main channels: containment measures, supply-side effects, and demand-side effects. The initial response to contain the coronavirus included a government-imposed quarantine, travel bans, and restrictions on public places. These restrictions severely affected the supply side since they disrupted the normal organization of production and business operations in the manufacturing and service industries. This, in turn, caused disruptions in global value chains and international trade, and some factories had to temporarily shut down for health and supply-related reasons. Additionally, increased uncertainty, containment measures, and changes in lifestyle (such as remote working and home-schooling) impacted the demand side, affecting consumption patterns and the structure of demand, especially in service industries like retail, hospitality, and personal care.

The effects of the pandemic were particularly intense in 2020. In the European Union, the epicenter of the coronavirus crisis for several weeks in spring 2020, GDP fell –5.7% (–3% Q1, –11% Q2), while the unemployment rate rose slightly from 6.7% to 7.1% [21]. Many countries around the world implemented a wide and effective range of measures to avoid massive corporate bankruptcies and mass layoffs. For example, Calabrese *et al.* [80] show that more than 90% of all debt funds provided to UK SMEs in the early months of the pandemic were backed by the UK government, compared to less than 5% under normal circumstances. However, other countries were either more timid in their approach or did not reach firms quickly enough [24,81].

Recent studies have analyzed the impact of some factors on firm resilience outcomes in the COVID recession. The results are contradictory and partial, and none report the contribution to variance in business performance from firm, industry, and country effects.

Regarding external effects, Shen *et al.* [82] investigated listed Chinese companies’ performance during the COVID crisis. These authors found that industries hit hardest by the pandemic saw a significant decline in corporate performance in the first quarter of 2020, and that the negative impact on performance was much more pronounced in areas severely affected by the COVID pandemic. Hu and Zhang [83] used financial data from companies worldwide to assess COVID’s impact on corporate performance. Their results show that the adverse effects of the pandemic are less pronounced in firms from developed countries (countries with stronger healthcare systems, more advanced financial systems, and better institutions). Mascagni and Lees [84] and Tourek [85] provide evidence on the worst-affected sectors and firm sizes in terms of aggregate sales in 2020 in Rwanda. The former concluded that while the sales of the average smallest firm fell by 23.2%, the average largest firm saw a decline of 14.3%. Restrictions on mobility during the lockdown and the consideration of essential industry influenced industry performance. They found that during 2020, especially during Q2, the sectors that suffered the most were accommodation and food services, transportation and storage, and wholesale and retail trade. Three other sectors with positive aggregate growth rates stood out: agriculture, energy and utilities, and manufacturing.

With regard to internal effects, in a study with Slovenian data, Redek *et al.* [48] provided evidence of the impact of the firm effect (firm agility and digitalization) on resilience outcomes during the COVID recession. According to these authors, firm agility and digitalization did not significantly affect firm performance in the short run (in the year 2020), with the most influential factor being the sectoral aspect. Sobaih *et al.* [81] found a positive relationship between resilience capability and a multidimensional performance construct in a sample of hospitality firms in Egypt in 2020. Rai *et al.* [86] analyzed the resilience capabilities in a sample of firms operating in India and found a relationship between firm resilience and economic outcomes during the COVID crisis. Song *et al.* [87] found that restaurant companies with past characteristics such as larger size, more leverage, greater cash flows, less ROA, and more internationalization were more resilient to stock declines reacting to COVID than otherwise comparable firms. Kaczmarek *et al.* [88] investigated data on over 1,200 travel and leisure listed companies in 52 countries. According to their analysis of 80 internal and external variables, firms with low enterprise valuation ratios, limited leverage, and high investments in countries with stringent containment and closure policies were more immune to the pandemic-induced crash.

Therefore, we lack conclusive empirical evidence on how firm, industry, and country effects impacted firm performance in the short term during the year of widespread lockdowns. We propose that in the recessionary phase of a wild card crisis, country and industry effects will outweigh firm effects in explaining short-term performance outcomes. The following hypothesis is formulated as a result:

H1. During the recession phase of a wild card crisis, country and industry effects on resilience outcomes are greater than firm effects.

2.6. Impact of firm factors on resilience outcomes during the COVID recession

The literature review has shown that internal factors have significant explanatory power for business results variance during recessions (Table 1, panels B and C). However, their implications for immediate outcomes in crises brought on by wild cards, like the recent COVID pandemic, are so far unclear.

The characteristics of the COVID crisis are unique in human history [29]. Unlike past global crises, such as the 2009 Great Recession, this one was almost impossible to predict. Furthermore, in contrast to other pandemics in a less globalized world, such as SARS in 2003, the scale of contagion and the impact of COVID on population health was enormous and of global proportions, provoking an unprecedented response from governments.

In each crisis, some business characteristics are more relevant than others [89]. In the COVID crisis, resilience was key [90,91,92].

Resilience has been defined as firms' capability to anticipate, deal with, and recover from crises by means of their abilities, actions, and behaviors. In shocks that are unpredictable, such as the recent pandemic, the capability to adapt is crucial [93,86]. Rai et al. [86] analyzed three types of resilience capabilities (crisis anticipation, adaptation, and recoverability) in a sample of firms operating in India and found that adaptive capability had the greatest explanatory power for economic outcomes during the pandemic. Thus, we expected that,

H2. During the recession phase of a wild card crisis, the higher a firm's adaptive capability, the better its resilience outcomes will be.

Other internal factors affecting businesses are particularly important in the event of external shocks. Various studies have shown that the availability of financial slack was essential for surviving the Great Recession [32,47], devastating earthquakes [94,95], and during the first months of the COVID [96,48,87].

Each crisis is different, but almost all put companies' ability to pay on the ropes [97,98]. During the early months of the Great Recession, the hardest hit sectors were real estate and finance. Banks cut credit, and many companies with liquidity problems became bankrupt because they could not meet short-term payments [99]. During the COVID recession in 2020, some companies were forced to suspend their activities, halting their income, but were unable to cut a large part of their current expenses. In this case, too, it was crucial to have the necessary liquidity to cope with during the first months of the crisis. Generally, during recessions, particularly global ones, the capitalist system ceases to function properly, significantly increasing the value of cash [97]. In these contexts, financial slack is a key resilience factor [39] that has proven to be crucial for predicting sales in the recent 2009 [32] and COVID [48] crises. Therefore,

H3. During the recession phase of a wild card crisis, the higher a firm's financial slack, the better its resilience outcomes will be.

Experience in crisis management is crucial for overcoming future crises, since greater familiarity with management under stressful conditions makes organizations better prepared and able to handle them [15]. The way organizations react to widespread disruptions becomes an integral aspect of their organizational culture and operational procedures, contributing to what is commonly called *organizational memory* [100]. Having experience solving similar problems accelerates their resolution by facilitating the design and implementation of emergency plans [29].

The empirical evidence for these arguments is clear. Barlow [101] found that past disaster experiences positively predicted future preparedness for shocks. Dahlhamer and D'Souza [27] found that firm size, ownership, and prior disaster experience were all related to firm disaster preparedness. Marshall et al. [102] discovered that companies with prior exposure to disasters and previous financial difficulties were less prone to failure after Hurricane Katrina. According to Marshall et al. [102], previous encounters with adversity can equip organizations with valuable knowledge and insights that help them prepare for, respond to, and recover from disasters. Recently, Alves et al. [103] conducted a qualitative analysis of small businesses in Macau, China, in the months following the COVID outbreak and found that firms with a long history and broader crisis experience had learned from these experiences and used this knowledge to develop crisis management strategies. Tosun et al. [29] examined stock market reactions to the COVID recession and suggested that companies' former exposure to the September 11 terrorist attacks partially "immunized" them against the consequences of a similarly destabilizing event. They argue that this resilience may stem from these firms having learned how to effectively manage sudden disruptions to their workforce, given their central location in New York City, their office space, and supply chains, as well as the need for rapid crisis management and effective stakeholder communication, and the shocks in their share prices.

In the context of family firms, the ability of these companies to accumulate experience from past crises has been highlighted as one of the main explanations for firm resilience [15,27]. As a distinctive characteristic of family firms, Basco et al. [104] describe the concept of *critical recovery memory* as a mechanism for responding to crises by drawing upon lessons learned from previous periods of uncertainty. They state that critical recovery memory is tacit organizational knowledge gained from past situations that businesses use to tackle new, unexpected crises. Czakon et al. ([15]: 2) found that "deep time horizon, symmetrical to long-term orientation but backwards focused, may confer a legacy capital consisting of knowledge and experience useful in developing an understanding and effectively addressing wild cards. Additionally, this understanding is socially constructed through the involvement of older generations." Hunter and Kazakoff [105] found that when multiple generations coexist within a company, it ensures the transfer of past crisis-related experience to the new generation, even when the latter lacks direct experience in such situations. In the opinion of De Ciantis and Lansberg [106], "multigenerational families also benefit from a long institutional memory of surviving past crises, sending a powerful signal of hope to the family that "this too shall pass." Similarly, family managers who have overcome previous crises have a significant influence on their company's resilience. Molloy et al. [107] concluded that running a business through previous crises made business owners feel like they had the tools and mental fortitude to survive through the COVID pandemic. Iborra et al. [108] found evidence that companies whose CEOs had experienced the 2009 crisis performed better during the COVID recession.

These arguments allow us to propose the following hypothesis:

H4. During the recession phase of a wild card crisis, the higher the level of prior crisis experience, the better the firm's resilience outcomes will be.

Firm size is one of the main factors of resilience [27,10]. For Marshall *et al.* [102], firm size is a proxy for the resources available to a company, where the number of employees indicates the amount of human resources available and sales represent the amount of financial resources. According to these authors, "it seems logical to assume that all things being equal, firm size would impact disaster recovery [because] of differences in quantity and nature of resources available to achieve recovery" (p. 337). Large size allows greater access to financial and human resources, but also to other resources, such as network and technological resources and relations with the government, which are essential in times of recession [109] and for recovery [110]. In addition, larger companies tend to be more diversified. Diversification is crucial in building resilience to external shocks [111] and is often associated with bigger companies [112]. Furthermore, the benefits of business diversification within a corporation are often referred to as the *corporate effect*, and this effect is studied as a key internal factor in the explanation of variance in firm performance [113].

From the above, we derive the following hypothesis:

H5. During the recession phase of a wild card crisis, the larger the firm size, the better the firm's resilience outcomes will be.

Fig. 3 depicts our hypothesized model.

3. Methods

The COVID crisis had very different impacts on businesses throughout 2020. The most challenging quarter was the second one, with a decline in world GDP of -9.1% (2020Q2 over 2019Q2, Fig. 4). Testing the hypotheses for this study requires access to monthly or quarterly data to measure resilience outcomes during the most severe phase of the crisis, in a similar way to what Mascagni and Lees [84] do. Additionally, surveys are recommended for gathering the data because it is necessary to capture complex constructs, such as adaptive capability.

We used data from a large-scale survey conducted during the COVID recession phase. Using a broad research scope, the survey analyzed and described firm's behavior after the first shock of the crisis. Consequently, we had to approximate certain constructs to measure our variables. The survey was conducted on both family and non-family businesses. We chose to focus solely on family businesses, since this allowed us to obtain a better measure of previous crisis experience, as we were not able to count on the individual experiences of managers.

3.1. Sample

Data were collected globally through STEP - Global Survey 2020. The STEP Project Global Consortium is an academic initiative that was created to study entrepreneurial practices (spgcfb.org). The survey relies on a convenience sampling strategy replicated in multiple countries. It was launched to better understand how family businesses fared during the global pandemic crisis and to analyze the impact of COVID on business management practices and performance. By the time the survey closed in October 2020, 3,010 firms from 75 countries in four macro-regions of the world had completed the questionnaire: Europe (55% of the questionnaires), the Americas (20%), Asia-Pacific (9%), and the Middle East and Africa (16%). For this study, micro firms with less than or equal to 10 employ-

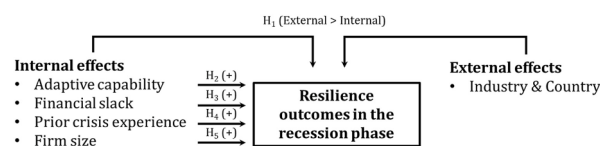


Fig. 3. Hypothesized model.



Fig. 4. World GDP. Market prices, constant 2010 US\$. Quarterly change. Source: Authors' calculations based on World Bank [21] data.

ees were removed from the sample. The final selection included 1,180 family firms due to this filter's application and the lack of data for some key variables of this study, especially the one related to financial slack. Appendix 2 shows the number of firms by country and industry.

3.2. Variables

We measured resilience outcomes during the recession phase (Fig. 2) using the change in sales between 2019 and 2020. This way of assessing resilience outcomes in the recession phase of a crisis is common in the literature [110,43,44]. The sales data collected by the questionnaire did not allow us to establish a ratio because firms answered the question *How has the COVID-19 pandemic affected the revenues of your business?* (answer: Revenue ... 1: has decreased, 2: has remained about the same, 3: has increased). Thus, the ordinal variable *Sales change* took the value -1 for a reduction in sales, 0 for maintenance, and $+1$ for an increase.

Country and industry variables were introduced as dummy variables. Because each category requires a minimum sample size of 30 ([114]: 264), only countries and industries with 30 or more responses were included in the regressions.

The firm effect during the crisis was measured using five variables.

Adaptive capability was measured using Lee et al.'s [115] adaptive capacity scale. The Lee et al. scale is made up of six dimensions (they worked on a seventh, strategic vision and outcome expectancy, but in their analysis, they did not obtain good loadings for two of the three reflective items). The STEP questionnaire adapted this scale to COVID. For example, in the Lee and colleagues scale, there is an item that reads: *Our organization is regarded as an active participant in industry and sector groups*. This item was rewritten in the STEP questionnaire as follows: *Our organization is regarded as an active participant in industry and sector groups to address the COVID-19 situation*. According to the confirmatory factor analysis (CFA) carried out, our data reproduce well the second-order factor structure of the original scale, except for the Silo mentality dimension, which we removed. Items with loadings below 0.4 were also removed. Items with loadings between 0.4 and 0.7 (the lowest loading is 0.53) were retained to avoid impairing content validity, according to the recommendation of Hair et al. [116]. The second-order factor model formed with the other five dimensions (see Appendix 1) yielded acceptable results according to the literature [117]:

- i) The factor loadings between the first-order construct (dimensions) and the second-order construct (*Adaptive capability*) are statistically significant ($p < .001$) and greater than 0.7 (there is a borderline loading of 0.69).
- ii) The overall model fit is within the standard limits considering the large sample size: $\chi^2 = 423.84$, $df = 72$, $p = .00$, AGFI = 0.93, CFI = 0.95, RMSEA = 0.06.
- iii) All factor loadings between items and latent constructs are significant ($p < .001$), although some are below the conventional cut-off of 0.7 but remain far from the limit of 0.4 [116].

In the hypothesis test, we used the factor scores obtained from the second-order factor structure.

Previous work has proposed the age of the company and/or the number of generations in the case of family firms as proxies for accumulated experience [105,118,119]. Following the approach of Stanley et al. [119], we chose the *Number of generations* currently involved in the firm and *Firm age* for our analysis. In our sample, 16.6% of the companies had two generations currently working in the firm, and 0.4% had three. The rest had only one. Considering that the existence of two generations makes it very likely that one of them had experienced the last global crisis (2009–2012), we coded the variable as 0 = one generation, 1 = two generations working together, and 2 = three generations working together. It is possible that if there was only one generation, it may have experienced the global crisis of 2009 or even an earlier one. To capture this situation, we have considered the firm's age. *Firm age* was measured as the natural logarithm of the firm age in 2020.

We used short-term cash to measure *Financial slack*. Firms disclosed how much cash they had in hand (in months) when the pandemic hit.

Finally, we measured *Firm size* with the natural logarithm of the number of employees in 2019.

3.3. Analysis

Given the nature of the dependent variable, we used ordinal regression to analyze the change in sales.

4. Results

Table 2 shows the descriptives. In our sample, only 14.1% of the firms increased sales, 20.6% maintained them, and 65.3% reduced sales. *Sales change* correlates positively (Spearman correlations, $p < .05$) with *Adaptive capability* and *Financial slack* as well as with some country and industry dummy variables.

Table 3 shows the impact that external (country and industry) and internal (firm) factors have on *Sales change*. Model 1 introduces country dummy variables. The model is statistically significant, and the country variables explain 4.63% of the dependent variable (DV) variance. Two countries have positive parameters that are statistically significant at the 5% significance level (Canada and Netherlands), and one country has negative ones (Rwanda). The tentative conclusion from these results is that the impact of the recession on firms' sales was not the same across countries, although the country effect explains a small part of the variance in the DV.

Model 2 analyzes the industry effects. The model is statistically significant, and industries explain 5.73% of the DV variance. Two industries have negative parameters that are statistically significant at 5% (Accommodation and food service activities, and Wholesale and retail trade), and one sector has positive parameters (Agriculture, forestry, and fishing). Two conclusions can be drawn from

Table 2
Descriptives.

Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	
1 Sales change	-0.513	0.729												
2 Spain	0.186	0.390	-0.045											
3 Germany	0.186	0.389	.060 ^a	-.229 ^b										
4 Venezuela	0.071	0.257	-0.041	-.133 ^b	-.132 ^b									
5 Rwanda	0.038	0.192	-.115 ^b	-.095 ^b	-.095 ^b	-0.055								
6 Morocco	0.026	0.160	-0.031	-.079 ^b	-.078 ^b	-0.045	-0.033							
7 Canada	0.025	0.157	.064 ^a	-.077 ^b	-.077 ^b	-0.045	-0.032	-0.027						
8 Greece	0.025	0.157	0.028	-.077 ^b	-.077 ^b	-0.045	-0.032	-0.027	-0.026					
9 UAE	0.028	0.165	-.059 ^a	-.081 ^b	-.081 ^b	-0.047	-0.034	-0.028	-0.027	-0.027				
10 Colombia	0.026	0.160	0.010	-.079 ^b	-.078 ^b	-0.045	-0.033	-0.027	-0.027	-0.027	-0.028			
11 Ireland	0.044	0.205	0.021	-.103 ^b	-.102 ^b	-.059 ^a	-0.043	-0.035	-0.035	-0.035	-0.036	-0.035		
12 Netherlands	0.026	0.160	.076 ^b	-.079 ^b	-.078 ^b	-0.045	-0.033	-0.027	-0.027	-0.027	-0.028	-0.027	-0.035	
13 Agriculture, forestry, and fishing	0.039	0.194	.092 ^b	0.005	-.085 ^b	-0.056	-0.017	0.049	-0.005	-0.005	-0.008	0.022	.127 ^b	
14 Manufacturing	0.263	0.440	-0.003	0.055	.126 ^b	-.090 ^b	-0.048	-.062 ^a	0.001	0.014	-.078 ^b	-0.014	-.062 ^a	
15 Construction	0.075	0.263	.073 ^a	-0.012	-0.028	-.066 ^a	0.011	.074 ^a	0.057	-0.046	-0.009	0.034	0.033	
16 Wholesale and retail trade	0.116	0.320	-0.048	-0.038	-.071 ^a	0.013	-0.003	0.040	0.025	0.025	.067 ^a	-0.026	0.051	
17 Transportation and storage	0.046	0.209	0.006	0.010	0.010	-0.029	-0.001	0.040	-0.010	-0.035	-0.013	-0.011	0.052	
18 Accommodation and food service activities	0.062	0.241	-.138 ^b	0.022	-.077 ^b	-0.044	.298 ^b	-0.042	0.003	0.003	0.020	0.002	.099 ^b	
19 Information and communication	0.029	0.167	0.021	-0.056	.178 ^b	-0.048	-0.008	0.035	0.004	-0.028	0.032	0.003	-0.037	
20 Professional, scientific, and technical activities	0.047	0.213	.069 ^a	0.026	-0.004	0.031	-0.044	-0.037	-0.011	-0.011	0.035	.063 ^a	-0.009	
21 Other service activities	0.131	0.338	-0.054	0.014	.060 ^a	0.000	-.077 ^b	-0.001	-.063 ^a	.065 ^a	-0.020	0.015	-.059 ^a	
22 Firm size (ln)	4.819	1.686	0.045	.090 ^b	-.171 ^b	-.098 ^b	-.167 ^b	-.078 ^b	-0.037	-0.047	.120 ^b	-0.050	.171 ^b	
23 Firm age (ln)	3.650	0.752	0.012	.136 ^b	0.035	-0.017	-.170 ^b	-.107 ^b	0.026	0.052	-.070 ^a	-.067 ^a	.064 ^a	
24 Number of generations	0.175	0.391	0.031	-0.002	-.060 ^a	0.007	.121 ^b	.094 ^b	-0.016	-0.002	.100 ^b	-0.032	-.086 ^b	
25 Adaptive capability	2.575	0.336	.083 ^b	.094 ^b	-.116 ^b	0.001	-0.033	-.081 ^b	-0.018	-0.031	0.015	0.015	.207 ^b	
26 Financial slack	8.396	10.673	.102 ^b	.122 ^b	-0.054	-.082 ^b	-.225 ^b	-0.019	0.052	-0.030	0.036	-.111 ^b	.259 ^b	
Variable	12	13	14	15	16	17	18	19	20	21	22	23	24	25
13 Agriculture, forestry, and fishing	0.022													
14 Manufacturing	-0.050	-.120 ^b												
15 Construction	0.034	-.057 ^a	-.169 ^b											
16 Wholesale and retail trade	0.056	-.073 ^a	-.216 ^b	-.103 ^b										
17 Transportation and storage	0.040	-0.044	-.131 ^b	-.062 ^a	-.079 ^b									
18 Accommodation and food service activities	-0.042	-0.052	-.153 ^b	-.073 ^a	-.093 ^b	-0.056								
19 Information and communication	-0.028	-0.035	-.103 ^b	-0.049	-.062 ^a	-0.038	-0.044							
20 Professional, scientific, and technical activities	.063 ^a	-0.045	-.133 ^b	-.063 ^a	-.081 ^b	-0.049	-.057 ^a	-0.038						
21 Other service activities	-0.033	-.078 ^b	-.232 ^b	-.110 ^b	-.141 ^b	-.085 ^b	-.100 ^b	-.067 ^a	-.087 ^b					
22 Firm size	.097 ^b	-0.013	.105 ^b	-0.009	-0.007	0.034	0.000	-.091 ^b	-0.056	-0.032				
23 Firm age	.165 ^b	0.010	.179 ^b	-0.030	.063 ^a	0.028	-.089 ^b	-.103 ^b	-0.056	-0.055	0.329 ^b			
24 Number of generations	-0.018	0.036	-0.035	0.000	-0.038	0.019	.072 ^a	0.002	0.015	-0.030	-0.002	-0.008		
25 Adaptive capability	-.060 ^a	-0.028	-0.040	-0.028	.082 ^b	-0.024	0.048	-0.034	0.050	0.029	0.210 ^b	0.027	-0.023	
26 Financial slack	.109 ^b	0.056	-0.033	0.052	-0.051	0.023	-0.033	0.013	0.029	-0.007	0.155 ^b	0.132 ^b	0.046	0.047

Note. Pearson correlations between continuous variables (22–26).

^a Spearman correlation is significant at the 0.05 level (2-tailed).^b Spearman correlation is significant at the 0.01 level (2-tailed).

these results: the industry effects are significant and similar to the country effect, showing that the sectors considered essential, such as agriculture and fishing, suffered less from the crisis than those affected by mobility restrictions, such as retail or accommodation.

Model 3 introduces the firm variables. Like the previous models, it is statistically significant. The variables explain very little of the variance in the DV (1.54%). Two variables present positive parameters that are statistically significant at the 5% significance level, *Adaptive capability* and *Financial slack*. The tentative conclusion from these results is that the impact of the recession on firm sales was smaller for firms that exhibited adaptive capability and had financial slack, but these characteristics explained only a very small part of the DV variance.

Table 3
Hypotheses testing.

	Dependent variable: <i>Sales change</i> ^a									
	Model 1		Model 2		Model 3		Model 4		Model 5	
	B	p	B	p	B	p	B	p	B	p
External factors										
<i>Spain</i>	−0.19	0.20					−0.14	0.36	−0.15	0.35
<i>Germany</i>	0.17	0.21					0.25	0.08	0.35	0.02
<i>Venezuela</i>	−0.28	0.21					−0.28	0.22	−0.24	0.30
<i>Rwanda</i>	−1.85	0.00					−1.51	0.01	−1.50	0.01
<i>Morocco</i>	−0.39	0.29					−0.46	0.20	−0.45	0.22
<i>Canada</i>	0.55	0.04					0.55	0.04	0.59	0.03
<i>Greece</i>	0.25	0.40					0.41	0.17	0.53	0.08
<i>UAE</i>	−0.79	0.06					−0.74	0.08	−0.87	0.04
<i>Colombia</i>	0.09	0.77					0.05	0.88	0.09	0.76
<i>Ireland</i>	0.14	0.54					0.17	0.50	−0.06	0.81
<i>Netherlands</i>	0.66	0.01					0.58	0.03	0.60	0.03
<i>Agriculture, forestry, and fishing</i>			0.58	0.01			0.51	0.03	0.60	0.01
<i>Manufacturing</i>			−0.13	0.39			−0.24	0.11	−0.20	0.19
<i>Construction</i>			0.31	0.10			0.26	0.18	0.28	0.15
<i>Wholesale and retail trade</i>			−0.38	0.05			−0.43	0.03	−0.41	0.04
<i>Transportation and storage</i>			−0.07	0.79			−0.14	0.59	−0.13	0.61
<i>Accommodation and food service activities</i>			−1.70	0.00			−1.54	0.00	−1.59	0.00
<i>Information and communication</i>			0.10	0.72			−0.01	0.98	−0.04	0.89
<i>Professional, scientific, and technical activities</i>			0.37	0.09			0.25	0.27	0.20	0.37
<i>Other service activities</i>			−0.33	0.07			−0.44	0.02	−0.45	0.02
Internal factors										
<i>Firm size</i>					0.01	0.69			0.03	0.41
<i>Firm age</i>					−0.04	0.55			−0.13	0.08
<i>Number of generations</i>					0.07	0.57			0.19	0.13
<i>Adaptive capability</i>					0.38	0.02			0.53	0.00
<i>Financial slack</i>					0.01	0.00			0.01	0.03
<i>Chi-square</i>	46.13	0.00	57.38	0.00	14.93	0.01	94.51	0.00	115.57	0.00
<i>Nagelkerke R² (%)</i>	4.63		5.73		1.52		9.30		11.27	
<i>Chi-square difference (df in parenthesis)</i>									21.06(5)	0.00
<i>N</i>	1,180		1,180		1,180		1,180		1,180	

^a Ordinal regression. Link function: Negative log-log.

Model 4 introduces both the country and industry variables. The R^2 rises to 9.30%. The results are consistent with models 1 and 2 when considering the parameters associated with the dummy variables. Model 5 adds the firm variables to Model 4. This model is statistically significant, and its R^2 increases by almost two percentage points thanks to the inclusion of the internal effects, which is far from the contribution of the external ones, which in the previous model explained 9.30%.

Models 1 to 5 show that external effects explain more DV variance than internal effects, thus supporting [H1](#).

The results of Model 3, and especially those of Model 5, allowed us to estimate the impact of internal factors. Only the effects derived from *Adaptive capability* and *Financial slack* are statistically significant, and moreover, in the predicted direction, so hypotheses [H2](#) and [H3](#) are supported, but not hypotheses [H4](#) and [H5](#).

Another noteworthy result is that most of the variance in the DV (88.73%) is not explained by any of the independent variables.

4.1. Additional tests

To test the robustness of our results, we tested the firm and external effects on another resilience outcome: change in the number of employees. This variable (*Employee change*) is not recommended for measuring resilience outcomes in the recession phase because firms can successfully cope with it by reducing employment [[44](#)]. However, some studies, especially in the context of pandemics, consider they do provide information on adaptive capability in that they suggest there is a positive relationship between sales and employee change [[85](#)].

Employee change was measured using the ratio of employees in 2020 to those in 2019. In our sample, companies lost, on average, slightly more than 8% of their employees, and this variable was moderately correlated with *Sales change* ($\rho = 0.39$). Given the nature of the dependent variable, we used ordinary least squares (OLS) to test the hypotheses. [Table 4](#) shows the results.

The results are similar to those obtained when examining the variance in *Sales change*. External factors explain 16.98% of the variance in *Employee change*, and internal factors explain 1.6%, which supports [H1](#). With respect to the analysis conducted in [Table 3](#), [Table 4](#) shows differences between countries with significant coefficients, meaning that the country effect is not only significant but also different depending on the outcome variable considered. The same is true for industries. Regarding the firm factors, the results are similar to those obtained in [Table 3](#), supporting hypotheses [H2](#) and [H3](#) but not hypotheses [H4](#) and [H5](#) ($p < .05$). Moreover, in this analysis, most of the variance in the DV (81.42%) is not explained by any of the independent variables.

Table 4
Robustness test.

	DV: Employee change			
	Model A1		Model A2	
	B	p	B	p
<i>Constant</i>	0.88	0.00	0.66	0.00
External factors				
<i>Spain</i>	0.02	0.20	0.01	0.53
<i>Germany</i>	0.06	0.00	0.06	0.00
<i>Venezuela</i>	−0.02	0.45	−0.01	0.60
<i>Rwanda</i>	−0.27	0.00	−0.25	0.00
<i>Morocco</i>	0.06	0.10	0.08	0.02
<i>Canada</i>	0.02	0.66	0.01	0.82
<i>Greece</i>	0.01	0.86	0.01	0.76
<i>UAE</i>	0.04	0.20	0.03	0.30
<i>Colombia</i>	0.00	0.96	0.01	0.72
<i>Ireland</i>	−0.04	0.11	−0.09	0.00
<i>Netherlands</i>	0.08	0.02	0.06	0.11
<i>Agriculture, Forestry, and fishing</i>	0.02	0.49	0.03	0.37
<i>Manufacturing</i>	0.07	0.00	0.06	0.00
<i>Construction</i>	0.07	0.00	0.06	0.01
<i>Wholesale and retail trade</i>	0.04	0.08	0.03	0.14
<i>Transportation and storage</i>	0.04	0.12	0.04	0.18
<i>Accommodation and food service activities</i>	−0.11	0.00	−0.11	0.00
<i>Information and communication</i>	0.07	0.03	0.07	0.03
<i>Professional, scientific, and technical activities</i>	0.01	0.63	0.01	0.59
<i>Other service activities</i>	0.02	0.25	0.02	0.33
Internal factors				
<i>Firm size</i>			0.01	0.07
<i>Firm age</i>			0.01	0.07
<i>Number of generations</i>			0.00	0.73
<i>Adaptive capability</i>			0.05	0.00
<i>Financial slack</i>			0.00	0.05
<i>Adjusted R² (%)</i>	16.98		18.58	
<i>N</i>	1,176		1,176	

Notes. OLS. Maximum VIF = 1.91.

Finally, we assessed endogeneity [120], a situation in which an explanatory variable is correlated with the regression error term [121]. We checked that the regression errors (e) were not correlated with the independent variables (all $\text{Cov}(X, e) = 0, p < .01$). Endogeneity is caused by measurement error, autoregression, omitted variables, and simultaneous causality [121]. We assessed the measurement error of the *Adaptive capability* construct, which is within the recommended limits (see the results of the CFA in the variable description section), but not that of the rest of the variables, which are measured with a single indicator. As a counterbalance to this risk, our study uses a very large sample of companies. Since our data are cross-sectional, it makes no sense that endogeneity is caused by a temporal autocorrelation problem. In relation to causality, there are variables captured at the same point in time: *Country*, *Industry*, *Sales change*, *Financial slack*, *Adaptive capability*, and *Number of generations*. The others, although obtained from the questionnaire also at that time, refer to information from the past, e.g., age or size (the latter is obtained from employees in 2019). The question therefore arises as to whether the variation in sales in 2020 can be the cause of these variables. Although the hypothesis of endogeneity between industry and firm performance is a classic problem in the strategic literature [122,7], it is not reasonable to think that *Sales change* during the COVID recession (very short-run performance) is the reason for choosing a certain industry, country or number of generations working in the firm. However, it is possible that it could be the cause of changes in *Financial slack* and *Adaptive capability*: companies that grow in recessions most probably generate more liquidity and may have increased their adaptability. We carried out an additional test using SEM techniques to verify this possibility. The test was to evaluate an alternative model in which causality is inverted, i.e., *Sales change* is an antecedent of *Financial slack* and *Adaptive capability*. Following Kline's [123] recommendations, we compared the AIC score of the alternative model (= 591.44) with the AIC score of the hypothesized model (= 574.89) to determine whether this alternative model fits the data better than the hypothesized model (*Sales change* is an outcome of *Financial slack* and *Adaptive capability*). Kline suggests that the lower AIC score represents the better fit, and we thus conclude that our hypothesized model is superior to the assessed alternative model.

5. Discussion and conclusion

5.1. The relative importance of external and internal effects on resilience outcomes

The latest global external crises (the Great Recession and COVID) have highlighted the importance of business resilience. Previous literature has shown that business performance during the first phase of a crisis (recession) is very important because it is positively

correlated with the firm's performance at the end of the crisis [18,19,20,44]. In this paper, we postulate and obtain empirical evidence that external effects on short-term resilience outcomes matter; and that they are much stronger than internal effects in a wild card crisis with supply and demand shocks such as the recent COVID crisis.

Our results show that the country effect explains 4.63% of the variance of the change in sales, the industry effect, 5.73%, and the firm effect, 1.97%. Our results are partially similar to studies that only estimate country and industry effects during crisis periods. For example, Bamiatzi *et al.* [8], for the period 2008–2011, estimated a country effect of 3.49% and an industry effect of 6.13%. Our results are also compatible with the recently carried out meta-analysis by Vanneste [5], who reported an average industry effect of 8%.

However, if we look at the amount of unexplained variance, our results differ significantly from previous studies listed in Table 1. While in our study, it is 88.73%, the consensus in previous literature cited in Table 1 reduces the error to less than half the variance. This discrepancy may be explained by the fact that multi-year studies, due to their better efficiency, tend to reduce estimation error. Another explanation may lie in outcomes measurement. Most studies that analyze the variance of outcomes do so using the return on assets (ROA) ratio. This variable is misleading in recessions because if the decline in returns is accompanied by a reduction in assets as a consequence of a turnaround strategy, the ratio may remain more stable than the variation in sales, which would explain a larger error in estimating the sales variation. There is also the possibility that the internal effects, estimated at 50% in previous research [5], may practically disappear in the very short term in a recession context, as the study by Redek *et al.* [48] evidenced.

In this sense, our results differ significantly from the empirical evidence collected so far. If we compare the variance explained by the firm effects in our study (Table 2) with other studies (Table 1), we observe that the differences are large. This is unlikely to be a result of the measure used to calculate the effect size (sum of squares, variance, or standard deviation; Vanneste [5] studied the impact of these measures on the results), the period considered (years of economic growth, stability, or crisis), or the size or composition of the sample. Previous research using multi-year periods has shown that the year effect is significant (Table 1), and other studies using one-year cross-sectional data have obtained results compatible with ours. For instance, Schmalensee [124] decomposed the variance in firms' benefits and found an industry effect of 19.59% and a firm effect of 0.62%.

Therefore, one explanation for the considerable divergence in the estimation of internal effects may be the time horizon over which the effect is estimated. While a wild card crisis is caused by unpredictable shocks of huge magnitude and widespread impact [15], the evidence suggests that the impact of these events varies significantly across industries and countries. In the case of the pandemic, this depends on factors such as being more or less affected by mobility restrictions, the population's needs, government aids, and the institutional environment, as well as the nature and severity of the epidemic and the duration of its effects. For example, in the short run, changes in consumer behavior, primarily driven by decreased demand, and the implementation of mandatory restrictions often result in substantial adverse effects on the leisure and hospitality industry. In the long term, the leisure and hospitality industry can recover easily, but a sudden upsurge in mortality and morbidity rates due to the epidemic can result in unforeseen and significant losses for the life insurance industry [61]. Hence, the discrepancy between our results and those of previous research could be explained by the different timing of the measurement of the results, very short-term (a few months) vs. long-term (several years).

Three countries stand out in our study. Two countries have statistically significant positive parameters at the 5% significance level (Canada and Netherlands), and one has negative parameters (Rwanda). The results of our study are consistent with the literature reporting asymmetries in the effects of COVID, which vary depending on the development level of the country [83]. In Rwanda, the impact was very strong on the informal economy and small firms [84], probably due to the government's difficulties in reaching the smaller businesses that employ a large proportion of the population.

Congruent with the literature (e.g., Tourek [85]), our results support the idea that in crises with mass lockdowns, firms in sectors considered essential (e.g., agriculture, forestry, and fishing) are less harmed than those that rely on mobility and leisure of citizens (e.g., accommodation and food service activities).

5.2. Firm effect during the recession caused by COVID

The internal factors that explain business resilience may vary from crisis to crisis. In a recent literature review, Su and Junge [39] focused on the form of the adverse event as a key to analyzing the antecedents and outcomes of resilience. Different forms appear depending on the event's type of emergence (gradual vs. sudden), novelty (non-novel vs. novel), and severity (livelihood-threatening vs. life-threatening impact). The COVID crisis was sudden, novel, and had life-threatening effects, which resulted in an immense threat to livelihoods. Firm adaptation was the key to overcoming it. Our results support this hypothesis and are consistent with previous research [86,81], although we obtained a smaller effect size, in line with the study by Redek *et al.* [48]. Perhaps the explanation lies in the fact that Sobaih *et al.* [81] did not include country and industry diversity in their analysis, as they worked only with a sample of Egyptian hotels and restaurants. Rai *et al.* [86] also do not take into account the country effect, as their study is conducted only in India. Alternatively, the very short-term variation in sales (two quarters) may not reflect the extent to which the organization is capable of adapting. This is compatible with Redek *et al.*'s study [48]. These authors argued that the nature and scale of the COVID crisis meant firms were unable to reverse the impact in the short term, regardless of their adaptive capability (they referred to this as the agility capability). Their results show that the impact of adaptive capability in 2020, albeit positive, is almost insignificant, although they expected it to be clearly noticeable in the recovery and post-adversity phases.

As illustrated in Fig. 2, in the adversity phase, two fundamental sub-phases can be distinguished: recession and bounce back [39]. During these phases, firms carry out sensemaking, absorption, adaptation, and coordination activities. Our results show that adaptability leads to better sales performance during the recession phase but with a small effect size. It is thus possible that the dependent variable analyzed is not the outcome that adequately captures the contribution of adaptive capability during a recession, even though the change in sales is a reliable indicator of what happens during the first phase of the shock.

In our study, we did not find evidence to support the hypothesis that past crisis experiences help achieve better resilience outcomes. This clearly contradicts the results of previous literature. A possible cause might be *superstitious learning* [125], which is learning that is not beneficial when events of an unknown nature occur. When faced with crises such as the COVID pandemic, lessons learned from other crises, like the Great Recession, may not be as useful. The problem is that there is also contrary evidence for the COVID crisis [103,29]. A plausible explanation is that certain internal processes, such as replacing the CEO in the inter-crisis period by another one with no experience in previous crises, may reduce the effectiveness of recovery memory (Iborra *et al.* [108] defend the usefulness of retaining CEOs with experience in two consecutive crises).

Our analysis supported the hypothesis regarding financial resource slack. This is in line with the recent results of Iborra *et al.* [32] in a study of sales during the 2009 crisis, and with Matysek-Jedrych *et al.* [96], Redek *et al.* [48] and Song *et al.* [87] in studies on the COVID crisis. It is important to note that this variable could have been neutralized with financial support from the government during the COVID recession and ceased to be significant. However, despite government financial support in many countries, the variable remains significant.

Finally, our hypothesis regarding firm size did not receive statistical support. Most of the literature discussed above is contrary to this result, although our results are consistent with those of Song *et al.* [87], who found no statistically significant correlation between pre-COVID size and returns. The composition of our sample, without micro firms, may explain the lack of significance. This is compatible with Mascagni and Lees's [84] results. These authors observed significant differences in the average growth rates of the smallest firms (first three deciles) during the COVID crisis.

5.3. Implications for policymakers

Industry effect matters. The protective measures introduced by governments during the COVID crisis to save firms and jobs have been successful, but some industries suffered more from the impact. In new wild card crises, investing more money and putting more effort into the industries that suffer most from these shocks would be advisable.

Our results show that the variations in employees and sales during the recession due to COVID are positively correlated ($\rho = 0.39$). This means that investments governments make in maintaining employment, even though they create public debt, accelerate the bounce in economic activity, allowing GDP to recover earlier and stronger.

Some studies claim that small firms suffered the most during the pandemic [84,85], and that government aid did not reach these firms in the hardest-hit industries [81]. Governments should address this problem in future wild card crises. Banks can play a crucial role in this issue, especially in heavily banked countries. They can engage proactively by identifying those clients in need of (financial) support and facilitating access to it.

In wild card crises, the probability of business failure is very high. Although from an industry perspective, business creation and death are necessary for business renewal, in a wild card situation like COVID-19, the conditions of competitive selection could go beyond what is desirable without government intervention. When a company disappears, intangible assets such as tacit knowledge, customer loyalty, or employee commitment also disappear. The use of government funds to provide temporary financial support to companies is a strategy that, in addition to granting time in the recovery phase, alleviates the suffering of the population.

Finally, in a globalized economy, supply chains and industries transcend countries and economic sectors. Greater supranational coordination could go a long way toward reducing the impact of extreme contexts on firms.

5.4. Implications for practitioners

Several studies have shown that having excess liquidity facilitates recovery from crises (e.g., [32,87]). Our research also confirmed this. An implication of our study, shared by another recent work (Redek *et al.* [48]), is that it is necessary to reduce cash stress during the inter-crisis period.

In the COVID recession, the ability to adapt was possibly more important than the ability to plan the response to it. Firm resilience during the adversity phase (Fig. 2) is built on factors such as communication and relationships, strategic vision, leadership, governance structures, innovation and creativity, and devolved and responsive decision-making [115]. Our study provides evidence for the role of the adaptive capability during the recession sub-phase in wild card crises; in fact, we believe that the company's open-mindedness and level of connection with its environment are critical.

5.5. Implications for research

As Dormady *et al.* [126] state, the temporal scale for assessing disaster resilience is a key empirical consideration. Our contribution to the current knowledge of short-term performance after an external shock supports the relevance of country and industry differences.

Cross-sectional, multi-country, and multi-industry studies conducted in atypical years (e.g., boom and recession years) provide a complementary view of firm performance variation. These studies are especially pertinent to recessions like those of 2009 or 2020. A longitudinal approach, such as Wang [113], can also be used. In any case, all internal and external factors should be explored to determine how they affect performance from one year to the next, and in the case of some shocks, quarter to quarter.

Performance is a construct with multiple dimensions [127]. Previous research has focused mainly on profitability variation. Since activity measures are more immediate in wild card crises [126] and the ones that ultimately define profitability, in this study, we considered two activity variables: change in sales and, accessorially, change in the number of employees. Sales is a variable directly affected by changes in demand from external shocks. Smallbone *et al.* [128] state that downturns affect sales first, then profitability, and finally, survivability. There are few studies that measure the effects of country, industry, and firm on performance variance using

firm sales (among the exceptions is that of Brito and Vasconcelos [64]). In the recessionary phase of a crisis, it is a measure that can bring out the greater influence of external factors.

Secondary data from company accounting (e.g., data from the Orbis Bureau Van Dijk Database) prevent short-term crisis effects from being measured (e.g., the hardest months of the COVID crisis), as they are calculated on an annual basis. Thus, wild card crisis research and, specifically, pandemic research based on firms' primary data (surveys, interviews) is fundamental.

Firm size did not receive statistical support in our research. Mascagni and Lees [84] found that the sales change calculated for 2020 (full year) was better for firms in the intermediate deciles (the best group of firms in terms of size was the 7th decile), indicating an inverted U-shaped relationship between sales growth and size. Our results, and those from Mascagni and Lees's study, raise an interesting question: Is it possible that medium-sized companies achieved better resilience outcomes? Similar to large companies, they probably enjoyed government support and were adequately resourced, though unlike them, they were quicker to weather the shock. This possibility should be explored in the future, remembering that size distribution across industries and countries may be key.

5.6. Limitations and further research

Our study was carried out with a convenience sample, so any generalization of our results should be made with much caution, despite the large number of firms studied ($N = 1,180$).

One of the problems that makes it difficult to reach a consensus on whether firm-level or industry- or country-level factors are more important is endogeneity, as the relationship between organizational capabilities, strategy, environment, and performance is endogenous, resulting in complex and reciprocal interactions at multiple levels [122,7]. Due to the nature of the data (cross-sectional) and the limitations of the questionnaire (difficulty in finding instruments), our tests of endogeneity were limited.

The way we measured *Sales change*, as an ordinal variable, has limitations. Also, the way we measured the amount of resources, business diversification, stakeholder relationships, etc., based on firm size, as well as previous experience in crises, has its limitations too. On the other hand, the lack of enough samples in several countries and industries forced us to study the country and industry effects of a few countries/industries against the reference category formed by the rest. Future work should improve these variables' accuracy and sampling.

The effect size of *Adaptive capability* on resilience outcomes has been marginal. It could be that the dependent variable, *Sales change*, is not the outcome that best captures the contribution of adaptive capability during the recession, even though a change in sales is a reliable indicator of what is happening during the first phase of the shock. Proxies for sensing and seizing [40,38] may contribute in this regard.

Our findings on the role of experience in crises are intriguing. While each crisis may differ from previous ones in the type of emergence, novelty, and severity, suggesting the presence of superstitious learning [125], some capabilities may be relevant for all of them, e.g., being able to sense, seize, and transform [32]. A new set of evidence based on better proxies of experience relevant to crises would be welcome.

In this study, beyond the correlations processed through hypothesis-testing regression, we have not analyzed the interactions among the three levels studied (country, industry, and firm). Multilevel studies may provide new insights, however, it is difficult to obtain a sufficient sample based on surveys, which is the method used to capture constructs such as those discussed in this paper.

5.7. Conclusion

This paper focuses on the relative importance of external and internal effects on resilience outcomes during the COVID pandemic, a wild card crisis. In contrast to previous literature, the paper concludes that external effects on short-term resilience outcomes are much stronger than internal effects. The findings also highlight the key role of adaptive capability and financial slack in the fight against the crisis.

Authorship statement

Authors have equally contributed to the article.

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Declaration of competing interest

The authors have no affiliation with any organization with a direct or indirect financial interest in the subject matter discussed in the manuscript.

Data availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Appendix 1. Adaptive capability scale

Construct/Item	Loading
<i>Communications and relationships</i>	.69
Employees in our organization work with whomever they need to work with to get the job done during the COVID-19 situation	.53
The relationship we have with our suppliers and customers is helping us to recover during the COVID-19 situation	.65
<i>Information and knowledge</i>	.90
It is our priority that employees have the information and knowledge they need to respond to the COVID-19 situation	.78
We make a conscious effort to ensure that critical information is available in different formats and locations to respond to the COVID-19 situation	.79
<i>Leadership management, and governance structures</i>	.92
Top management team provides good leadership during the COVID-19	.79
Our managers are monitoring the workload of our team and help them to address the stress of the COVID-19 situation	.72
Top management team think and act to ensure that our organization is ahead of the challenges that COVID-19 situation is creating	.77
<i>Innovation and creativity</i>	.88
Our managers and employees are learning every day to solve problems and moving forward during the COVID-19 situation	.80
Our organization actively encourages employees to challenge and develop themselves to overcome the problems that the COVID-19 situation is creating	.81
Our employees are trying to use their knowledge and abilities to respond in a novel way to the COVID-19 situation	.71
<i>Devolved and responsive decision making</i>	.88
Our employees were prepared and respond quickly to the COVID-19 situation	.53
During the COVID-19 situation managers are always accessible to employees on the front lines	.67
We have made tough decision quickly to respond to the COVID-19 situation	.57
The most qualified to make decisions make them regardless of seniority during the COVID-19 situation	.57

Note: Adapted from Lee et al. [115]. Scale: 1 (strongly disagree) to 5.

Appendix 2. Sample by country and industry

Country	N	%	Country	N	%
Spain*	220	18.6	Argentina	7	0.6
Germany*	219	18.6	Kenya	7	0.6
Venezuela*	84	7.1	Andorra	6	0.5
Ireland*	52	4.4	HongKong	6	0.5
Rwanda*	45	3.8	Belgium	5	0.4
UAE*	33	2.8	Honduras	5	0.4
Colombia*	31	2.6	Philippines	5	0.4
Morocco*	31	2.6	SaudiArabia	5	0.4
Netherlands*	31	2.6	Malaysia	4	0.3
Canada*	30	2.5	Australia	3	0.3
Greece*	30	2.5	NewZealand	3	0.3
India	28	2.4	SouthAfrica	3	0.3
China	25	2.1	Ghana	2	0.2
Egypt	22	1.9	Lebanon	2	0.2
USA	21	1.8	Lithuania	2	0.2
Ecuador	20	1.7	Portugal	2	0.2
France	20	1.7	Scotland	2	0.2
Austria	17	1.4	Bahrain	1	0.1
Mexico	17	1.4	Bangladesh	1	0.1
Brazil	16	1.4	Bolivia	1	0.1
Cyprus	16	1.4	Chile	1	0.1
Taiwan	15	1.3	Israel	1	0.1
UK	13	1.1	Libya	1	0.1
Finland	12	1.0	Nicaragua	1	0.1
Italy	12	1.0	Norway	1	0.1
Guatemala	11	0.9	Switzerland	1	0.1
Singapore	10	0.8	Thailand	1	0.1
SriLanka	10	0.8	Uruguay	1	0.1
Peru	8	0.7	Vietnam	1	0.1
Total			1,180		100
Industry			N		
Manufacturing*			307	26.0	
Other service activities*			154	13.6	
Wholesale and retail trade; repair of motor vehicles and motorcycles*			137	11.6	

(continued on next page)

(continued)

Industry	N	%
Not assigned	105	8.9
Construction*	86	7.3
Accommodation and food service activities*	73	6.2
Professional, scientific, and technical activities*	54	4.6
Transportation and storage*	53	4.5
Agriculture, forestry, and fishing*	46	3.9
Information and communication*	33	2.8
Miscellaneous	25	2.1
Financial and insurance activities	23	1.9
Real estate activities	20	1.7
Human health and social work activities	19	1.6
Arts, entertainment, and recreation	13	1.1
Education	11	0.9
Water supply; sewerage, waste management, and remediation activities	11	0.9
Electricity, gas, steam, and air conditioning supply	10	0.8
Total	1,180	100

*Included as independent variable.

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