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Operating, financial and investment impacts of Covid-19 in SMEs: Public policy demands to sustainable recovery considering the economic sector moderating effect

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ABSTRACT

Currently, many institutions and academics are working to establish strategies of economic recovery with the aim of mitigating the short- and long-term impacts of the COVID-19 crisis. The main aim of this study is to analyze how this crisis has impacted Spanish SMEs, considering their operating, financial, and investment activities. We also analyze the initiatives or public policies that SME managers consider necessary in order to face the effects of COVID-19. To do this, an empirical study has been carried out based on information from 612 Spanish SMEs, estimating a PLS research model and multigroup analysis that considers the activity sector as a moderating variable. The results are useful to companies and different economic and social agents, providing information to facilitate decision-making to overcome pandemic crisis mainly in the economic and strategic spheres.

1. Introduction

COVID-19 is having great health, social, and economic impact on the world [1]. Many companies have been hard hit and important problems have emerged that limit their competitiveness or even their survival [2]. Because of this unexpected crisis, there has been a shock to supply chains and demand caused by lower consumption, which has decreased companies' income [2]. This decrease is especially worrying in the case of SMEs [1]. The impact of a reduction in productive activity has negatively affected employment [3] and could have negative effects on firm performance and value [4,5]. Assessing the impact of COVID-19 on SMEs is particularly important in Spain, since the official statistics showed they represent 99% of companies, and generate over 62% of Gross Value Added and 66% of employment [6].

Currently, many institutions [7–13] and academics [14] are working to establish strategies of economic recovery with the aim of mitigating the short- and long-term impacts of the COVID-19 crisis. To manage this crisis, it will be necessary to establish short-, medium-, and long-term policies that will lead the way to a strong and sustainable recovery [15]. To develop these policies, it is

Abbreviations: SMEs, Small and Medium Enterprises; OECD, Organisation for Economic Cooperation and Development; IMF, International Monetary Fund; GDP, Gross Domestic Product; PLS-SEM, Partial Least Squares Structural Equation Modeling; BCT, Business Cycle Theory; RBCT, Real Business Cycle Theory; EU, European Union; TER, Temporary Employment Regulation; MICOM, Measurement model invariance assessment; CBSEM, covariance-based structural equation modeling; MGA, multigroup analysis; HTMT, Heterotrait-Monotrait ratio; AVE, average extracted variance; ANOVA, Analysis of Variance.

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essential to have quantitative and qualitative information about the behavior of companies faced with the economic effects of COVID-19. This will make it possible to better understand the needs and imbalances that may occur and, thus, efficiently manage resources to help boost the economy. Furthermore, this information must be agile and constant as long as the uncertainty about the length of this health crisis remains. We are facing a time when decisions must be made quickly as what is decided will have important consequences in the future [7].

Although the COVID-19 outbreak began just a year ago, researchers have been quick to analyze this crisis [16–23]. However, its characteristics make it necessary for academics to continue studying this phenomenon since COVID-19 is an unusual and complex shock that combines elements of supply, demand, and productivity shocks, particularly in the context of SMEs [20,24] and family entrepreneurs [25,26]. The crisis has affected the business sector in all countries [27], and each country is taking different policy actions in the short and long term [28]. All this makes it difficult to properly understand the phenomenon, its impact, and the consequences that it may have on SMEs. Hence, there is a need to continue contributing to the scarce literature with studies that analyze the economic impact of the pandemic and which should serve as policy instruments to mitigate the impact of COVID-19 on SMEs.

Previous literature, in the framework of Shock-Based Business Cycle Theory, identified that firms react very heterogeneously to unexpected shocks among different production sectors [29–31]. Particularly, in the context of the EU the impact of macroeconomic shocks varies across countries and sectors due to different degrees of heterogeneity [31]. Therefore, research on the impact of COVID-19 on businesses should include the economic activity and inter-industry variations of analyzed companies [32–34]. Following previous reasoning, the main aim of this study is to analyze how the crisis of COVID-19 has impacted Spanish SMEs, considering their operating, financial, and investment activities and the economic activity sector. We also analyze the initiatives or public policies that SME managers consider necessary to face the effects of COVID-19. This information will be a valuable strategic planning tool both for company management and public policy makers who can use it to address their plans of action and promote efficient management of the crisis. This could help governments who are currently taking steps to limit the damage caused by COVID-19 to companies [35]. The research questions are: What has the impact of the crisis generated by COVID-19 been on SMEs according to their economic activity sector? What public policy initiatives do SMEs put forward to face the impacts of COVID-19? Does the economic activity sector matter? Studying Spanish SMEs is especially important for various reasons: (1) Spain ranks last in the COVID-19 pilot Index for OECD countries, which analyzes the efficient management of this crisis [36]; (2) expectations of a drop in the Spanish GDP as a consequence of this crisis are extremely high compared to other European countries [11]; (3) the impact of this crisis on employment will be especially important [3]; (4) the Spanish business landscape, characterized by the significant presence of SMEs and sectors which are very sensitive to the crisis, will be particularly impacted by COVID-19 [9].

This paper contributes to the literature in several aspects. First, the studied relationship is necessary in order to obtain a solid political response that could help minimize the negative effects of COVID-19 [22] and to design sustainable, equitable, and fiscally responsible policies [37]. Second, the results obtained in the study contain important practical implications for SMEs and policymakers in the designing of efficient policies that should be customized according to the specificities of different economic sectors. Indeed, our results confirm important findings such as how COVID-19 has negatively impacted the operating activities of SMEs, which has had a negative effect on their investment and financing activities. The demand of policies results shows that, in general, the policy most demanded has to do with regulations and financial measures. In the case of SMEs suffering from greater negative investment impact, there is a preference for competitiveness policy. Finally, activity sector does exert a moderating effect when it comes to the relationship among COVID-19 negative impacts and their impact on the preference for policy.

The rest of the article is organized as follows: first, a study of the literature is carried out and the research model is proposed. Next, the methodology and characteristics of the sample and research model are explained. Subsequently, after an analysis of the model using the partial least squares estimator (PLS-SEM), the results and a discussion about them are addressed. Finally, the conclusions are presented, detailing managerial and public policy implications.

2. Shock-based business cycles literature review: the COVID impact on SMEs

Economic recessions are recurring events due to the cyclical nature of the economy, motivating companies to adapt their strategies to cope with the changes brought about by recessions [38]. Traditional Business Cycle Theory (BCT) sustains that each cyclical phase of the economy brings the basis for generating the next economic cycle in a self-sustaining cycle [39]. BCT is associated to demand, supply side and shocks. Macroeconomic research on BCT is supported by equilibrium economic modeling considering a simultaneous negative and positive shocks in economy that let achieving a competitive equilibrium of market economy and an efficient resources allocation maximizing the expected utility [40]. In general terms, macroeconomic literature highlights how uncertainty shocks produce relevant downturns in economic activity having negative consequences on output, consumption, investments, and employment [41]. The last is particularly important in the case of COVID-19, due to pandemic provoked a decrease in productivity since many employees could not attend physically to their companies [42].

An evolution of BCT is Real Business Cycle Theory (RBCT) or Shock-Based Business Cycle Theory that sustains that uncertainty and unexpected shocks are completely related to business cycles causing that without shocks there are not economic cycles [39]. Research on RBCT models are based on unexpected shocks and exogenous variables, in other words, on unobservable patterns [43]. Those unforeseen shocks cause important fluctuations in the business cycles that in many cases are related to technology improvements and/or demand conditions [44,45]. However, previous literature has suggested that most of uncertainties in the real world are one-sided, as in the case of COVID-19 and requires the exploration of endogeneity of uncertainty shocks [42].

Additionally, at a microeconomic level and because of heterogeneity of businesses, according to RBCT a negative shock as COVID-19 has direct one-side effect lowering outputs, growth and investments [46]. In a first moment, a shock would also affect the

expectation of firms' fundamental variables provoking shifts in productivity, profitability, growth, as well as investment and financing decisions [34,47]. Therefore, exogenous shocks would simultaneously condition production, investments and financing decisions of companies [48]. In addition, uncertainty shocks interact with financial restrictions having a negative effect on investments of companies in physical capital. However, this crisis is different from previous ones. This time COVID-19 shock involves not just capital supply challenges but also affects supply chains and income paralysis [49].

In the context of Shock-Based Business Cycle Theory, previous literature highlights that when assessing the impact of unexpected shocks becomes necessary to consider firm heterogeneity [50]. In this vein, crisis and unpredicted disasters affect asymmetrically companies depending on sector, size and age. In terms of business's size, previous literature recognizes that it is a core variable to consider when measuring the impact of shocks on the economy. In that sense, large companies are better prepared to face a lockdown, since they have more resources to resist under an unexpected crisis scenario. They are more resilient than SMEs [51]. Corredera-Catalán et al. [52] have identified the particularly severe effect of COVID-19 pandemic on SMEs because of their higher vulnerability and lower resilience. However, although SMEs are more affected by unexpected disruptions, they can be more flexible to adapt to changes under uncertainty conditions [53].

Considering the age of the firm, previous literature also confirmed that there are differences in cyclical dynamics according to firm's age, being younger companies more sensitive to unexpected shocks because of information asymmetries [54]. Young firms are more impacted by downturns because they have more constraints due to limited reputation in both product and credit markets [55].

Regarding sector heterogeneity response to shocks, Caporale [30] identified that industry-specific aspects are empirically relevant during downturns. In that sense, Baürle & Steiner [29] from a production-side analysis assessed how aggregate downturns affect sector-specific value added. They found that after a shock the economy reacts very heterogeneously among different production sectors. In that sense, output impact varies across sectors in extent and time lags. In the context of the EU the impact of macroeconomic shocks varies across countries and sectors due to different degrees of heterogeneity [31]. Therefore, research on the impact of COVID-19 on businesses should include the economic activity and inter-industry variations of analyzed companies [32–34].

2.1. Operational, financial and investment impacts of COVID-19 on SMEs considering the economic sector

The crisis caused by COVID-19 pandemic has impacted SME operational, financial, and investment activities in accordance with Shock-Based Business Cycle Theory. Contrarily to traditional equilibrium models under Business Cycle Theory, shocks do not carry similar and synchronized movements in output across sectors. Literature on BCT identifies a comovement across industries in terms of production, because of canonical business cycle models report global output decrease as the results of the aggregation of individual output impacts per each sector [56]. Hovarth [57] showed that traditional equilibrium models under BCT were modified, since there were not able to successfully incorporate sector-specific disturbances. In that respect, more recent literature developed Multi-Industry Real Business Cycle dynamic stochastic models that identified a different degree of inter-sectoral comovements behavior. These recent studies highlight that industry-specific shocks are significantly more important than previously assumed [58]. Thus, comovement effects of shocks varies across sectors according to heterogeneity among them. In fact, low comovement shows that shocks are heterogeneously transmitted to sectors because of existence of idiosyncratic factors [29]. Those factors are related to elasticities of substitution in the input supplying side. As a consequence, lower sectoral comovement it is expected when there are higher elasticities of substitution across different factors of production and supposes that sectors have the opportunity to avoid the shocks of their input supplying sectors [57–59]. In other words, the more correlation across industries output is considered the more homogeneous would be the impact of shocks in all industries.

Furthermore, previous literature showed a different impact of shocks because of intrinsic characteristics of some activity segments. For example, sectors such as construction has less capitalization of financial structure and less internally generated funding that other sectors, so they are more exposed to lack of external funds during crisis periods [60–62]. In that sense, under demand shocks sectors more export oriented react more quickly and better than domestic oriented to changes in foreign demand. However, under exchange rate shocks, banking and insurance with a lower dependency of imported intermediate goods have a better reaction than manufacturing sector [29].

Therefore, to assess the impact of COVID-19, the RBCT and Shock-Based Business Cycle Theory justify the need to consider the relevance of firm heterogeneity. In that respect, productivity in an industry varies widely from another. Tan et al. [34] showed that the impact of business shocks within inter-industry variation on financial leverage is generally accepted in literature and is associated with cross-sectional leverage distribution in a specific industry. However, authors identified a research gap and lack of understanding on the drivers and consequences of intra-industry variations. Their findings indicated that shocks intensify intra-industry changes of leverage.

Saleh [33] revealed that COVID-19 had different effects according to the economic sector. This author compared food *versus* entertainment sector achieving a distinct impact of pandemic in terms of sales and profits. Sarkodie and Owusu [32] disclosed some examples of different impact of global crisis due to pandemic by economic sectors. They identified that some logistic activities such as transportation, aviation and related industries declined while primary and health economic sectors rebooted helping to sustain economy. Furthermore, in the EU context, Juergensen, Guimon & Narula [63] confirmed the same that in other world countries, since majority of SMEs belonging to any economic sector are suffering the pandemic crisis to a different extent. In particular, SMEs of agro-food and medical equipment industries are increasing revenues.

In the Asian context, current research identified that not all sectors are affected by pandemic crisis in the same manner. Qiu et al. [64] and Liu et al. [65] paid special attention to decrease in firm's value of quoted companies belonging to hospitality, transportation, lodging and catering industries. They highlighted a higher impact on capitalization value compared to other countries.

According to Bartik et al. [50]; there are important cross-industry variations and heterogeneity since the effects of pandemic crisis does not impact all companies equally. Authors suggested that disparities among sectors would increase if the COVID-19 crisis lasts a

long time. Firms belonging to critical economic sectors remain open while others suffer the shutdown. Bartik et al. [50] mentioned that more impacted firms are those of arts and entertainment, personal services and tourism and lodging. In contrast, banking and finance, real state and professional services would be able to face the crisis better than other economic sectors. Besides, authors sustained that in terms of job destruction SMEs are suffering much more than large firms. There is a generalised consensus regarding the different impact of COVID-19 crisis on particular economic sectors worldwide. This is the case of tourism, hospitality, travel and transportation industries because implies direct personal relationship among people and free global movement between countries in their business model [51,64].

In the Spanish context this previous theoretical argument is empirically sustained with differences by sectors. Thus, for example during shocks Spanish construction firms maintains a weaker status because of their lower financial autonomy and a significative dependence from external financing from banks. However, constructions companies have more barriers to get funding during shocks since they are characterized by relevant overhead costs, expensive equipment, and numerous fulltime workers with very long periods to receive payments from customers [62]. So, their recovery cycle is much longer than their payment cycle [60]. Rathke et al. [31], identified that higher degree of dissimilarity regarding behavior reaction to a shock is Spanish construction sector. In fact, authors found that manufacturing and constructions sectors to be more heterogeneous than the rest. In that sense, Rathke, et al. [31] affirmed that construction firms are still not fully recuperated from last financial crisis.

After reviewing the literature, in Fig. 1, we develop the research model considering the following hypotheses:

H1. The operational impact of COVID-19 on SMEs has different financial effects according to the economic sector

H2. The operational impact of COVID-19 on SMEs has different investment effects according to the economic sector

H3. The financial impact of COVID-19 on SMEs has different investment effects according to the economic sector

In order to overcome the coronavirus crisis, governmental public policies have become an essential tool to help companies. International institutions (OECD, IMF) demanded to worldwide governments to implement policies to sustain SMEs under the risk of failure. In the EU setting, the European Commission has approved an extraordinary funding program called "Temporary Framework regarding state aid measures aimed at supporting the economy in the context of the current COVID-19 outbreak", as well as to avoid the destruction of the productive economy, especially of the most vulnerable, the self-employed, individual entrepreneurs, micro and SMEs. The European framework allows member states to concede initial funding in the form of repayable advances, guarantees on loans, discounts on the interest rates and/or other repayable instruments, and recapitalization measures (temporary participation of states in the ownership of companies). Furthermore, European regulation allows temporary deferrals for the payment of taxes or social security contributions, the granting of periods without interest, the suspension of tax contributions and accelerated tax refunds and payments in the form of salary subsidies. In this context, Spanish authorities adopted the European regulation to aid Spanish SMEs. De la Fuente [66] showed the main social and economic public policies to counteract the effects of the pandemic in Spanish economy. Policies go in three directions: 1. Flexibilization of labor market and subsidize temporarily unemployed workers; 2. Public funding for companies and self-employed workers in terms of non-refundable grants, loans and guarantees, deferred taxes and social contributions to help facing liquidity problems of companies; 3. Social policies for most vulnerable population (households' minimum income). According to Pedauga et al. [67] the impact of employment in Spanish SMEs account for two-thirds of the employment reduction. This is the reason for the authors to sustain the need of credit policies for SMEs. Specifically, public guarantees to overcome credit constraints to SMEs during the COVID-19 crisis in order to foster revenues and investments.

However, due to the fact that not all sectors are suffering the COVID-19 impact in the same way, public policies should be focused on specially affected companies. In that sense, the most affected economic sectors in Spain are those of retailing, transport, tourism, restaurants, personal services and entertainment. Activities that are considered non-essential and involves mobility and face-to-face

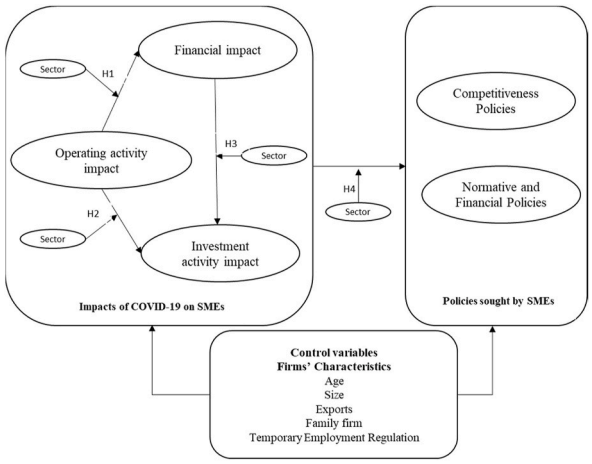

Fig. 1. Research model proposal.

contact. In that sense, due to the predominance of SMEs the impact of the COVID-19 crisis is especially relevant [66].

Following the above reasoning, we consider the next hypothesis:

H4. The economic sector has a moderator effect in the relationship between impact of COVID-19 on SMEs and the demand for competitive, normative, and financial public policies.

The inclusion of the control variables that characterize the companies makes it possible to analyze whether the impacts caused by COVID-19 depend on these variables, and whether the demand for policies is intrinsically affected by specific characteristics such as age, size, international trade or family character and having opted for Temporary Employment Regulation (TER).

The research adds a new approach to existing literature focusing on how COVID-19 shock affects asymmetrically different economic sectors in Spain, considering the inter-industry behavior of SMEs [68]. Thus, Spanish SMEs require customized different normative and financial policies from public authorities. This new contribution also follows a new methodology through the multigroup analysis, MICOM analysis which is a three-step approach, to assess the invariance of composite following Henseler et al. [69] approach. Fig. 1 shows the proposed research model.

3. Methods

3.1. Sample

The general design of the sample is based on the principles of stratified sampling. To do this, it is necessary to define the stratification criteria that will be a function of the study's objectives, the existing information, the population structure, and the resources available to carry out the field work. The criteria used for stratification are correlated with the variables under study, considering the fact that precision generally decreases with an increasing number of strata. Therefore, the number of criteria and strata must be moderate and consistent with the maximum sample size we can work with. In this study, the following strata were established: sector (Manufacturing, Construction, and Retail and Services) and size (micro, small, and medium). Within each stratum, the selection has been made through simple random sampling. The field work was organized through the Spanish General Council of Economists and the Spanish General Council of Official Associations of Graduates and Industrial Technical Engineers. Different reminders were sent to try to adjust to the designed stratification as closely as possible. Information was gathered by means of an online survey through a self-administered questionnaire. The field work was carried out from May 11 to June 4, 2020.

SMEs are particularly important in Spain, since the official statistics showed they represent 99% of companies, generate over 62% of Gross Value Added and 66% of employment. In particular, SMEs employ more than eight million workers. According to economic sector and in terms of Gross Value Added, SMEs belonging to commerce contribute with 28%, followed by services (24%), industry (15%) and, finally, construction (12%) [6]. The sample finally obtained was of 612 Spanish SMEs, with a sampling error of 4.2 points and a confidence level of 95%. Population sizes (total number of companies in each stratum) were obtained from the Central Business Directory edited by the National Statistics Institute [6]. Non-response bias and common method variance bias were analyzed. Responses from the first round of questionnaires were not significantly different from the responses obtained from the last round (t and chi-squared test) [70], and Harman's single-factor test proposed by Podsakoff and Organ [71] verified that the bias of the common method variance was not relevant in our study.

The main characteristics of the sample used in this research are the following (Table 1). More than 68% of the sample are family firms, 51% belong to the services and retail sector, 33.7% of the firms have been involved in temporary employment regulation (TER), the group of micro-firms accounts for 48.9% of the sample, and 38.4% are internationalized. The average age of the firms is 26.26 years, and the average number of employees is 31.34.

Table 1
Sample characteristics.

		Number of firms	%
Family firm	Yes	418	68.3
	No	194	31.7
Activity sector	Manufacturing	190	32.9
	Construction	98	16.1
	Services and retail	325	51.0
Temporary employment regulation (TER)	Yes	206	33.7
	No	406	66.3
Size	Micro	299	48.9
	Small	209	34.2
	Medium	104	17.0
Internationalization	Yes	235	38.4
	No	377	61.6
	Mean	*Standard Deviation*	
Age (years)	26.26	18.721	
Number of employees 2019	31.34	50.745	
• Before COVID 2020	31.96	53.501	
• After COVID 2020	27.52	48.405	

3.2. Measures

The selection of variables is essential when configuring an empirical analysis, and they allow us to adequately study company behavior when faced with the COVID-19 crisis. To obtain the information, we used a questionnaire addressed to the company manager. We have sought to collect clear and concise information to minimize any possible misunderstandings. The questionnaire design was developed from a review of the literature on economic or financial crises. A crisis is considered an unusual event that threatens the basic structures of a company, causing great uncertainty and urgency when decisions have to be made [72].

3.2.1. COVID-19 impact measures

Companies have different levels of vulnerability to a crisis depending on their economic and market positions [72]. We have considered three different types of impact based on the activity affected: operational, financial, and investment. All the items of impact were measured using a five-point Likert scale, where 1 signifies little impact and 5 represents great impact.

a) Impact on operating activities: these are activities that have affected the daily operations of the company, especially in relation to the flow of income. The items in this construct were adapted from the work by Geroski and Gregg [73,] and Soininen et al.[74]. Questions were asked about the impact of COVID-19 on: (1) firm sales levels; (2) difficulties in carrying out the general operations of the company; and (3) cancellations of customer orders.
b) Impact on financial activities: the COVID-19 crisis is causing financial problems as a consequence of the drastic drop in sales in many companies. Therefore, it is feared that this crisis will have an eventual impact on financial markets and result in undervaluation of capital risk [75]. The most indebted SMEs may have more difficulties to renew their loans as a consequence of a possible negative shock to credit supplies [76,77]. The items used in our research are based on the studies by Soininen et al. [74] and Ogawa and Tanaka [78]. SME managers were asked about the impact of COVID-19 on: (1) difficulties in obtaining financing; (2) their clients' terms of payment; (3) losses due to non-payment by customers and (4) more restrictive terms of payment imposed by suppliers.
c) Impact on investment activities: the uncertainty and lack of access to financing in times of crisis generally cause investment paralysis in companies [76]. The literature reports that an economic crisis has negative effects on investment [79], production, and new product lines [80]. The items in this construct measure the impact on: (1) making investments in assets; (2) the introduction of new products; and (3) investment in new technological processes.

3.2.2. Public policy demands by SMEs

Public authorities can implement a wide range of political measures to mitigate the impact of a crisis. These measures will depend on the ability of governments to face the crisis from the perspective of their tax and monetary policies [81]. In our study, we suggested measures grouped into stimulation programs to managers, such as credit enhancement, and tax and labor market measures [81]. The proposed measures have been collected from previous studies, like those by Boukas and Ziakas [82]; Cömer and Çolak [83], and Ba et al. [84]. Managers were asked to indicate the level of importance of these policies in aiding their companies' recovery from the COVID-19 crisis, where 1 is not important and 5 is very important.

In particular, normative and financial policies refer to public measures related to reduction in taxes, increasing liquidity through the banking system, discounts on the interest rates, labor flexibility and reducing social security costs [66]. Competitiveness policies consist of fostering infrastructures, promoting access to international markets, training and advising programs, and promoting digitalization of companies [85].

3.2.3. Control variables- firms' characteristics

In order to include variables that may affect the impact of the COVID-19 crisis, we have considered the following: age [86], size [87], ownership, firms involved in temporary employment regulation (TER), and degree of internationalization [88]. According to Shock-Based business Cycle Theory, crisis and unpredicted disasters affect asymmetrically companies depending on size and age [54]. These variables will help us to identify the main characteristics of the firms that are suffering the greatest impact and also the characteristics of the firms demanding the different policies. In this way, they are introduced as control variables in all the constructs included in the proposed model.

TER becomes one of the initial and most common public policy to help SMEs against the COVID-19. Adopted for many countries worldwide was developed to enforce the temporary closure of non-essential companies, providing managers with legal instruments as temporary employment regulation, using public funds to keep wages of suspended employment. Being this kind of policies particularly critical for SMEs [24].

3.3. Analysis

In order to address the research aim of this paper, we consider both multivariate and univariate analyses. In relation to the multivariate methodology, Structural Equation Modeling considering PLS estimations is used (SmartPLS 3.3.3). The main reason for choosing PLS instead of CBSEM [89,90] [89,91,92] is the use of a composite model (Mode A). Additionally, the model proposed is complex in terms of the number of relationships [93]. First, we estimate the global model considering 10,000 subsamples using bootstrapping technique for the total sample and the subsamples according to the activity sector. Second, to test the differences of the model proposed in each sector, we carried out a multigroup comparison approach with the use of PLS. Previously, we had tested the measurement invariance of the proposed model through the MICOM procedure [69]. The measurement model offers us evidence about convergent and discriminant validity and the reliability of the constructs. Latent variables obtained by the PLS estimation can be analyzed using both univariate and multivariate techniques in order to identify how they behave in different kinds of companies,

thereby obtaining clear knowledge about the impact of COVID-19 and the policies SMEs require.

4. Results

4.1. Measurement model

Table 2 shows both the construct and item indicators obtained from the PLS estimation. In the proposed model, all the constructs are type A. The results report evidence in favor of convergent and discriminant validity and reliability. In this regard, the factor loadings and the Cronbach's alpha are above the minimum threshold [94], and the average extracted variance (AVE) and composite reliability produced satisfactory outcomes, which leads us to verify the reliability of the constructs; that is, their internal consistency [95]. The relationship between the square root of the AVE of the construct and its correlation with other constructs (Table 3) satisfy the Fornell and Larcker [96] criterion. The data also verified discriminant validity related to the correlations of the Heterotrait-Monotrait (HTMT) ratio [69,97] (Table 3).

4.2. Univariate analysis

When running mean difference tests (T-student for independent samples or ANOVA test with post-hoc analysis), the results highlight significant differences in relation to the latent variables obtained from the proposed model (Table 4). The operating impact caused by COVID-19 is more important in family firms (0.051 vs −0.109), firms which have been included in temporary employment regulation (0.511 vs −0.259), internationalized firms (0.173 vs −0.108). The financial impact provoked by COVID-19 is greater in family firms (0.051 vs −0.111) and firms with a TER (0.248 vs −0.125). Regarding investment impact, we find greater impact in firms with TER (0.387 vs −0.196), and internationalized firms (0.150 vs −0.094). When it comes to requested policies, competitiveness policies are asked for more often by firms without international experience (0.061 vs −0.098) and micro firms (0.195) also request these policies more than medium-sized firms (−0.184). Regarding the demand for normative and financing policies, the univariate results point out that these policies are more urgently sought by family firms (0.106 vs −0.229), firms with TER (0.127 vs −0.064), and micro firms (0.155), compared to medium-sized companies (−0.264). These univariate analyses change when considering segmented sample by activity sector (manufacturing, construction and services and retail). In this sense, non-family firms in the service industry are suffering a more important operating impact that their counterparts (−0.045 vs −0.253). Financial impact provoked by COVID-19 is not affected by having been included in a TER in the construction and the service industry while this is the case in the manufacturing sample (0.265 vs −0.340). This impact is higher in the construction firms that have their sales internationalized (0.493 vs 0.052). Regarding investment impact, internationalization increases this impact in services industry (0.090 vs −0.220), but this is not the case

Table 2
Measurement Model assessment.

Items	Constructs	Mean	SD	Loadings (p-value)	Q^2
OI Operating activity Impact Composite A					
Cronbach's alpha: 0.765; Dijkstra–Henseler's rho (ρA): 0.775; CR (ρc): 0.865; AVE: 0.681; Q^2: 0.102					
OI_1	Sales level	3.26	1.621	0.822 (0.000)	0.167
OI_2	Crisis makes our operations more difficult in general	3.83	1.143	0.772 (0.000)	0.028
OI_3	Customer has canceled orders	3.18	1.389	0.879 (0.000)	0.110
FI Financial activity Impact Composite A					
Cronbach's alpha: 0.839; Dijkstra–Henseler's rho: 0.839; CR: 0.886; AVE: 0.608; Q^2: 0.220					
FI_1	Financing is difficult to obtain	2.80	1.285	0.768 (0.000)	0.250
FI_2	The lack of financing is putting our future at risk	2.81	1.408	0.770 (0.000)	0.242
FI_3	Customers take more time to pay	3.34	1.400	0.786 (0.000)	0232
FI_4	Our default losses have increased	2.88	1.418	0.802 (0.000)	0.202
FI_5	Our suppliers have tightened their collection period	2.59	1.349	0.771 (0.000)	0.166
II Investment activity Impact Composite A					
Cronbach's alpha: 0.705; Dijkstra–Henseler's rho: 0.706; CR: 0.837; AVE: 0.634; Q^2: 0.276					
II_1	Productive investments have been reduced	3.30	1.793	0.704 (0.000)	0.297
II_2	The introduction of new products has been reduced	2.70	1.413	0.812 (0.000)	0.233
II_3	The investment in new technology has been reduced	2.80	1.447	0.864 (0.000)	0.297
CP Competitiveness Policy Composite A					
Cronbach's alpha: 0.854; Dijkstra–Henseler's rho (ρA): 0.875; CR (ρc): 0.894; AVE: 0.590; Q^2: 0.071					
CP_1	Infrastructure programs	3.28	1.358	0.570 (0.000)	0.049
CP_2	Incentives to access international markets	3.24	1.427	0.611 (0.000)	0.032
CP_3	Training programs and grants	3.78	1.244	0.790 (0.000)	0.060
CP_4	Information and advisory programs for companies	3.68	1.239	0.850 (0.000)	0.097
CP_5	Grants and programs for the digitization of SMEs	3.89	1.204	0.872 (0.000)	0.083
CP_6	Grants and programs for the digitization of customers	3.71	1.281	0.856 (0.000)	0.069
N&FP Normative and Financial Policy Composite A					
Cronbach's alpha: 0.844; Dijkstra–Henseler's rho: 0.845; CR: 0.895; AVE: 0.681; Q^2: 0.150					
NFP_1	Reduction in taxes	4.00	1.240	0.831 (0.000)	0.161
NFP_2	Increase in banking system capacity to finance SMEs	3.83	1.243	0.831 (0.000)	0.193
NFP_3	Support for interest rate decreases	3.80	1.256	0.833 (0.000)	0.155
NFP_4	Decreases in social security costs	4.09	1.206	0.806 (0.000)	0.160

Notes: CR: Composite Reliability Index; AVE: Average Extracted Variance; Q^2: Cross-validated redundancies Stone–Geisser Q^2 index.

Table 3
Measurement Model. Discriminant Validity Fornell-Larcker (F-L) and ratio HTMT.

F-L	1	2	3	4	5	HTMT	1	2	3	4
1. OI	**0.825**									
2. FI	0.601	**0.780**					0.748			
3. II	0.593	0.597	**0.796**				0.802	0.777		
4. CP	0.223	0.297	0.270	**0.768**			0.284	0.356	0.355	
5. N&FP	0.371	0.445	0.367	0.576	**0.784**		0.463	0.525	0.476	0.681

Notes: OI: operating activity impact; FI: financial activity impact; II: investment activity impact; CP: competitiveness policy; N&FP: normative and financial policy. Fornell-Larcker Criterion: Diagonal elements (bold) are the square root of the variance shared between the constructs and their measures (AVE). For discriminant validity, diagonal elements should be larger than off-diagonal elements.

for the other two sectors. Competitiveness policy is more demanded by family firm in manufacturing sector in relation to their counterparts (−0.116 vs −0.435). Normative and financial policies are more important for manufacturing firms included in a TER (0.048 vs −0.313) and micro manufacturing firms, while these two conditions do not create a higher demand for this policy in the construction and service sectors.

4.3. Structural model

Results for the proposed model are shown in Table 5. Considering bootstrapping based on 10,000 subsamples used to analyze the significance of the paths. The predictive relevance of the theoretical/structural model was assessed with the cross-validated redundancy index (Q^2) for endogenous constructs. Both in the total sample and in the subsamples. All Q^2 values were greater than 0, and we found evidence of the predictive relevance of our model [91]. Results reveal that there are significant relationships among COVID-19 impacts on SMEs. In fact, considering the total sample, the impact of operating activity positively affects the impact of financing (coef.: 0.621; t-student: 20.501) and investment activities (coef.: 0.339; t-student: 7.587). Consequently, the operating impact suffered by a company will result in increased financing and investment difficulties. That is, the more the sales are affected by COVID-19, the more difficulty these companies will have in terms of operations and the cancelation of orders. This makes it more difficult for firms to obtain funds, collect money from their customers, and pay their suppliers. Similarly, productive investment, launching new products, and new technology decrease in proportion to the operating impact on companies. Furthermore, as expected, the investment impact linked to the crisis is also affected by the financial impact (coef.: 0.382; t-student: 9.423). Thus, firms' investment activity is affected by the lack of available financing funds due to the COVID-19 crisis. These paths are significant once we have included the control variables in the model to characterize the profile of firms suffering from the impact of COVID-19.

In relation to the control variables characterizing firms suffering negative impacts from COVID-19, the results of the structural model show that the negative operating impacts of the crisis are negatively affected by age (coef.: −0.112, t-student: 2.777), positively influenced by the percentage of sales in international markets (coef.: 0.074, t-Student: 1.819), and that these impacts are more important in family firms (coef.: 0.082, t-student: 2.149), firms with TER (coef.: 0.372 t-student: 10.428). Therefore, the negative operating impacts of COVID-19 increase with exports and are greater in younger, family firms, and companies which have benefited from TER. The financial impacts are not affected by any of the control variables once we have introduced the link between operating impacts and financial impacts. The previously mentioned univariate differences disappear. In relation to the characterization of companies affected by investment impact in the structural model, it is relevant to highlight that firms with TER (coef.: 0.075; t-student: 2.259) are more affected by this kind of impact. Significant findings after controlling the impact of COVID-19 by size and age are according to previous results identified in literature under Shock-Based business Cycle Theory, since the impact of crisis and unpredicted disasters affect asymmetrically companies depending on size and age [31,52,54]. In fact, results confirmed that SMEs are less prepared to face a shock, since they have less resources to resist under an unexpected crisis scenario. Besides, younger companies are more sensitive to unexpected shocks because they have more constraints due to limited reputation in both product and credit markets [55].

When it comes to the policies sought by managers to face the crisis, findings for the total sample report that there are significant paths between each kind of impact and normative and financing policies. More specifically, the highest coefficient is found for the path between financial impact and these types of policies (coef.: 0.282; t-student: 6.424), followed by the one linked to investment impact (coef.: 0.122; t-student; 2.711) and to operating impact (coef.: 0.139; t-student; 2.687). Therefore, policies related with reductions in taxes, social security costs, and interest rates, and increases in financing for SMEs and labor flexibility are more in demand as the negative financial, investment, and operating impacts caused by the COVID-19 crisis increase. Regarding demand for competitiveness policies, we do not find a significant path linking these kinds of policies to operating activity impact but we do when it comes to negative financial impact (coef.: 0.182; t-student: 3.482) and negative investment impact (coef.: 0.122; t-student: 2.711) of COVID-19. These findings show that the impact of COVID-19 can generate different degrees of SME demand for competitive, normative, and financial policies. Consequently, competitiveness policies are sought by companies due to the negative financial and investment impacts of COVID-19, while normative and financing policies are demanded due to the negative operating, financial, and investment impacts of the crisis. These paths are significant once we have included the control variables in the model to characterize the profile of firms demanding these policies. In fact, any one of the control variables introduced is significant for competitiveness policy requests, while normative and financial policies are more often demanded by smaller companies (size coef.: −0.090; t-student: 2.257), those with little internationalization (coef.: −0.091 t-student: 2.153) and by family firms (coef.: 0.091 t-student: 2.461).

Table 5 also show the results when estimating the model separately in each of the three sectors considered. In order to compare the

Table 4
Firms' Characteristics. Univariate analysis. Mean Difference T-Student test for independent samples or Anova test.

LV	Criteria		Total sample			Manufacturing			Construction			Services		
			Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value	Mean	SD	p-value
OI	Family Firm	Yes	0.051	1.007	*0.066*	0.135	1.073	0.362	0.174	0.908	0.710	−0.045	0.991	*0.076*
		No	−0.109	0.980		−0.024	1.074		0.243	0.791		−0.253	0.971	
	TER	Yes	0.511	0.808	*0.000*	0.548	0.802	*0.000*	0.341	0.858	0.219	0.550	0.802	*0.000*
		No	−0.259	0.990		−0.319	1.121		0.116	0.867		−0.335	0.946	
	Exports	Yes	0.173	1.028	*0.001*	0.163	1.092	0.294	0.297	0.664	0449	0.145	1.054	*0.002*
		No	−0.108	0.969		−0.002	1.047		0.153	0.944		−0.231	0.937	
	Size	Micro	−0.009	1.013	0.382	0.137	1.176	0.819	0.382	0.968	0114	−0.136	0.959	0.199
		Small	−0.044	1.008		0.039	1.031		0.061	0.737		−0.177	1.088	
		Medium	0.120	0.953		0.138	1.052		−0.058	0.733		0.166	0.894	
FI	Family Firm	Yes	0.051	0.988	*0.063*	0.011	0.993	0.159	0.191	0.999	0.957	0.027	0.984	0.162
		No	−0.111	1.022		−0.225	1.111		0.180	1.016		−0.136	0.962	
	TER	Yes	0.248	0.926	*0.000*	0.265	0.938	*0.000*	0.386	0.917	0.142	0156	0.923	0.054
		No	−0.126	1.015		−0.340	1.026		0.076	1.032		−0.088	0.990	
	Exports	Yes	0.078	1.019	0.126	0.027	1.038	0.220	0493	0.851	*0.044*	0.007	1.025	0.671
		No	−0.049	0.987		−0.158	1.014		0.052	1.035		−0.043	0960	
	Size	Micro	0.062	1.017	0.263	0.127	1.088	0.340	0.147	1.017	0.805	0.027	0.996	0.447
		Small	−0.086	1.007		−0.142	1.064		0.175	0.971		−0.135	0.963	
		Medium	0.008	0.934		−0.070	0.903		0.342	1.064		−0.052	0.908	
II	Family Firm	Yes	0.043	1.011	0.116	0.161	1.048	*0.085*	0.310	1.009	0.235	−0.126	0.963	0.976
		No	−0.093	0.975		−0.131	1.013		0.061	0.901		−0.122	0.992	
	TER	Yes	0.387	0.878	*0.000*	0.445	0.874	*0.000*	0.398	0.853	0.195	0.309	0.909	*0.000*
		No	−0.196	1.003		−0.246	1.079		0.130	1.033		−0.268	0.950	
	Exports	Yes	0.150	0.995	*0.003*	0.171	1.048	0.180	0.275	0.864	0.742	0.090	0.977	*0.009*
		No	−0.094	0.994		−0.034	1.033		0.205	1.028		−0.220	0.956	
	Size	Micro	−0.069	1.033	0.141	0.063	1.217	0.723	0.167	1.089	0.813	−0.164	0.966	0.545
		Small	0.021	1.022		0.033	1.061		0.254	0.907		−0.091	1.026	
		Medium	0.153	0.847		0.177	0.838		0.345	0.794		0.021	0.894	
CP	Family Firm	Yes	0.040	0.988	0.146	−0.116	1.040	*0.067*	0.154	0.963	0.730	0.094	0.953	0.499
		No	−0.086	1.024		−0.435	1.144		0.085	0.863		0.017	0.983	
	TER	Yes	0.016	0.986	0.779	−0.081	1.041	0.141	0.070	1.002	0.633	0.086	0.917	0.855
		No	−0.008	1.009		−0.312	1.100		0.164	0.888		0.063	0.980	
	Exports	Yes	−0.098	1.034	*0.056*	−0.251	1.104	0.486	0.078	0.845	0.711	0.015	0.994	0.514
		No	0.061	0.976		−0.141	1.043		0.154	0.966		0.092	0.950	
	Size	Micro	0.195	0.943	*0.000*	0.202	0.944	*0.010*	0.278	1.006	0.322	0.164	0.932	*0.073*
		Small	−0.185	1.026		−0.354	1.121		−0.011	0.843		−0.086	0.987	
		Medium	−0.184	1.017		−0.316	1.034		0.009	0.845		−0.107	1.046	
NFP	Family Firm	Yes	0.106	0.948	*0.000*	−0.017	1.034	*0.009*	0.272	0.865	0.294	0.124	0.909	*0.006*
		No	−0.229	1.073		−0.474	1.152		0.074	0.912		−0.194	1.060	
	TER	Yes	0.127	0.920	*0.025*	0.048	0.949	*0.021*	0.319	0.784	0.343	0.122	0.948	0.277
		No	−0.064	1.035		−0.313	1.171		0.142	0.931		−0.015	0.980	
	Exports	Yes	−0.033	1.020	0.522	−0.212	1140	0.319	0.331	0.712	0.351	0.051	0.923	0.690
		No	0.021	0990		−0.053	1.007		0.150	0.947		0.004	0.996	
	Size	Micro	0.155	0.912	*0.000*	0.213	1.018	*0.014*	0.326	0.866	0.420	0.094	0.897	0.125
		Small	−0.090	1.052		−0.176	1.069		0.075	0.932		−0.054	1.077	
		Medium	−0.264	1.073		−0.407	1.100		0.138	0.812		−0.242	1.114	

Notes: LV: Latent Variables; OI: Operating Activity Impact; FI: Financing Impact; II: Investment Impact; CP: Competitiveness Policies; NFP: Normative and Financial Policies; TER: Temporary Employment Regulation; SD: Standard Deviation; p-value from T-student or Anova Test.

Table 5
Structural model results.

Paths	Total sample Coef. (T-value) [Biased corrected intervals]	Manufacturing Coef. (T-value) [Biased corrected intervals]	Construction Coef. (T-value) [Biased corrected intervals]	Services Coef. (T-value) [Biased corrected intervals]
Operating activity Impact_Financial Impact	0.621 (20.501)*** [0.569; 0.670]	0.587 (10.223)*** [0.481; 0.672]	0.630 (9.399)*** [0.498; 0.72]	0.673 (15.380)*** [0.595; 0.74]
Operating activity Impact_Investment Impact	0.339 (7.587)*** [0.259; 0.404]	0.576 (8.894)*** [0.465; 0.678]	0.133 (1.202) [-0.054; 0.311]	0.185 (2.769)** [0.077; 0.294]
Financial Impact_Investment Impact	0.382 (9.423)*** [0.318; 0.452]	0.242 (3.365)*** [0.122; 0.358]	0.571 (6.28)*** [0.396; 0.698]	0.449 (7.914)*** [0.356; 0.541]
Operating activity Impact_Competitiveness Policy	0.053 (0.862) [-0.049; 0.154]	0.121 (0.916) [-0.103; 0.317]	0.187 (1.293) [-0.054; 0.311]	0.001 (0.010) [-0.148; 0.152]
Operating activity Impact_Normative and Financial Policy	0.139 (2.687)** [0.042; 0.214]	0.096 (0.859) [-0.100; 0.326]	0.360 (2.870)*** [0.14; 0.552]	0.112 (1.546) [-0.011; 0.227]
Financial Impact_Competitiveness Policy	0.182 (3.482)** [0.079; 0.257]	0.081 (0.792) [-0.087; 0.248]	0.061 (0.397) [-0.165; 0.341]	0.231 (3.126)** [0.105; 0.349]
Financial Impact_Normative and Financial Policy	0.282 (6.424)*** [0.203; 0.354]	0.260 (3.105)** [0.114; 0.391]	0.264 (2.047)** [0.048; 0.497]	0.293 (4.628)*** [0.187; 0.395]
Investment Impact_Competitiveness Policy	0.152 (2.949)** [0.072; 0.243]	0.135 (1.090) [-0.079; 0.328]	0.290 (2.161)** [0.056; 0.474]	0.154 (2.423)** [0.042; 0.251]
Investment Impact_Normative and Financial Policy	0.122 (2.711)** [0.055; 0.205]	0.150 (1.451) [-0.016; 0.323]	−0.111 (0.872) [-0.328; 0.090]	0.161 (2.916)** [0.068; 0.250]
Control variables: Firms' Characteristics				
Age_Operating Impact	−0.112 (2.777)** [-0.170; −0.035]			
Exports_ Operating Impact	0.074 (1.819)** [0.012; 0.149]			
Family firm_ Operating Impact	0.082 (2.194)** [0.021; 0.143]			
Temporary Employment regulation_ Operating Impact	0.372 (10.428)*** [0.304; 0.423]			
Temporary Employment regulation_ Investment Impact	0.075 (2.259)** [0.015; 0.126]			
Size_ Normative and Financial Policy	−0.090 (2.257)** [-0.146; −0.014]			
Exports_ Normative and Financial Policy	−0.091 (2.153)** [-0.153; −0.011]			
Family firm_ Normative and Financial Policy	0.091 (2.461)** [0.032; 0.155]			
Adjusted R^2/Q^2Blindfolding				
Operating Impacts	0.150/0.102	0.166/0.128	0.015/0.022	0.194/0.125
Financing Impacts	0.361/0.218	0.369/0.234	0.365/0.233	0.371/0.216
Investment Impacts	0.447/0.276	0.586/0.355	0.442/0.288	0.381/0.219
Competitiveness Policies	0.110/0.065	0.076/0.060	0.164/0.097	0.104/0.061
Normative and Financing Policies	0.247/0.167	0.369/0.192	0.199/0.129	0.241/0.157

Notes: OI: Operating Activity Impact; FI: Financing Impact; II: Investment Impact; CP: Competitiveness Policies; NFP: Normative and Financial Policies. One-tailed t-values and p-values in parentheses; bootstrapping 95% confidence intervals (based on n = 10,000 subsamples). In this table only significant paths related to the characterizing variables are reported in total sample.

results and test the hypotheses, and determine if they are significant, we use multigroup analysis in the next section.

4.4. Multigroup analysis: differences in activity sector

To ensure the quality of the results with respect to the multigroup analysis the assessment of the measurement invariance of composite models has to be done. We follow Henseler et al. [69] procedure to develop a MICOM analysis which is a three-step approach: (1) configural invariance, (2) compositional invariance, and (3) the equality of composite mean values and variances [69,93].

Configural invariance was achieved in all the groups as identical items per construct, identical data treatment, and identical algorithm settings verify the configural invariance of the constructs. Compositional invariance was tested by means of MICOM procedure considering a one-tailed permutation test for the latent variables at 5% significance level with 5000 permutations. This procedure ensures that differences in the path coefficients were not due to the differences in the ways the constructs had been formed across the groups. Following Hair et al. [93]; the correlation between the composite scores was computed and the null hypothesis, correlation equal to 1, was tested. The resulting non-significant permutation p-values for each measurement model was the indication of the establishment of compositional invariance for the constructs. With respect to the full measurement model invariance assessment, the equality of composite means, as well as variances, were checked [69,93]. The outcome of the MICOM showed that the means and variances of composites across the sectors were not equal, thus indicating the failure to establish a full measurement invariance criterion. However, group comparison was feasible since compositional invariance had already been established, allowing to assume

Table 6
Multigroup analysis Sector.

Paths	Manufacturing-Construction				Manufacturing-Services				Construction-Services			
	Path difference	PLS-MGA p-value	Parametric test p-value	Welch-Satterthwait Test p-value	Path difference	PLS-MGA p-value	Parametric test p-value	Welch-Satterthwait Test p-value	Path difference	PLS-MGA p-value	Parametric test p-value	Welch-Satterthwait Test p-value
H1: Operating activity Impact_Financial Impact	−0.044	0.305	0.320	0.311	−0.086	0.113	0.113	0.115	−0.043	0.302	0.309	0.295
H2: Operating activity Impact_Investment Impact	0.443	*0.000*	*0.000*	*0.000*	0.391	*0.000*	*0.000*	*0.000*	−0.052	0.344	0.350	0.342
H3: Financial Impact_Investment Impact	−0.329	*0.003*	*0.003*	*0.002*	−0.207	*0.011*	*0.012*	*0.012*	0.121	0.126	0.142	0.126
H4a: Operating activity Impact_Competitiveness Policy	−0.066	0.369	0.376	0.367	0.120	0.220	0.219	0.225	0.186	0.139	0.154	0.139
H4b: Operating activity Impact_Normative and Financial Policy	−0.276	0.059	0.062	0.058	−0.016	0.456	0.448	0.451	0.247	*0.047*	*0.046*	*0.045*
H4c: Financial Impact_Competitiveness Policy	0.021	0.454	0.454	0.436	−0.150	0.119	0.112	0.115	−0.170	0.156	0.141	0.157
H4d: Financial Impact_Normative and Financial Policy	−0.004	0.488	0.489	0.489	−0.033	0.378	0.374	0.375	−0.029	0.423	0.414	0.420
H4e: Investment Impact_Competitiveness Policy	−0.155	0.196	0.213	0.196	−0.019	0.451	0.438	0.444	0.135	0.178	0.160	0.180
H4f: Investment Impact_Normative and Financial Policy	0.261	0.056	0.062	0.057	−0.011	0.460	0.458	0.462	−0.272	*0.026*	*0.013*	*0.027*

partial measurement invariance [69]. The results of the MICOM procedure have been displayed in Annex 1.

Next, we compared the activity sectors with a multigroup analysis (MGA). Results show significant differences in the paths between the groups (Table 6). Findings exhibit that manufacturing companies suffer a greater impact on their investments as a result of the adverse effects of COVID-19 on operations than companies in the construction sector (path difference manufacturing-construction: 0.443) and in the services sector (path difference manufacturing-services: 0.391). Therefore, it seems that the construction and the services sectors are more resilient in terms of investment since the decrease of operating activities does not affect their investments in the same manner. The explanation for these results can be found in the COVID-19 effects on demand reduction for durable and non-essential goods. Manufacturing sector has specially suffered the impact of disruptions on production because of logistics problems and the breakdown of supply chain in those more globalized companies such as car industry [66]. Besides, Spanish SMEs in some manufacturing sectors are more affected by aggregated demand than big companies because have a greater intermediate consumption of material and components [67]. Furthermore, Spanish industry is characterized by an important dependency on automotive manufacturing companies, so industry segment in Spain can be strongly affected by such dependency [66]. In that respect, Chu [98] informed that automotive industry worldwide is expected to experience a decrease in profits of around 100 billion dollars.

However, investment in construction and services sectors is more affected by the negative impact of COVID-19 on the financial position of SMEs compared to manufacturing sector (path difference manufacturing-construction: −0.329; path difference manufacturing-services: −0.207). These results show that the impact of COVID-19 on investment is sensitive to different factors depending on the sector. Thus, while the manufacturing companies are more capitalized, construction and services sectors are more dependent of external financial resources, according to previous literature that showed lower capital values for constructions companies [99]. In that respect, construction firms are characterized by managing long-term projects with large fixed-costs and relevant need of resources, since the inflows from customers are deferred and have a long maturity period. Hall et al. [61] indicated how construction firms have a financial structured more based on external debt, since construction companies are more related to long-term debt. Moreover, construction sector relies more on important investments of tangible assets than other sectors having an important volume of loans instead of self-finance their investments [100].

Besides, in the Spanish context, financial capital is specially impacted since during shock periods construction companies suffer from opportunistic behaviors from general contractors impacting on equity funds [62]. Spanish construction firms maintain a weaker status because of their lower financial autonomy and a significative dependence from external financing from banks. Constructions companies have more barriers to get funding during shocks since they are characterized by relevant overhead costs, expensive equipment, and numerous fulltime workers with very long periods to receive payments from customers [62]. So, their recovery cycle is much longer than their payment cycle [60]. Rathke et al. [31] identified that higher degree of dissimilarity regarding behavior reaction to a shock is Spanish construction sector. In that sense, authors affirmed that construction firms are still not fully recuperated from last financial crisis. This less capitalization of financial structure and less internally generated funding of other sectors apart from manufacturing and services can explain why investments are more affected in construction companies by financial needs during COVID-19 crisis.

Results confirmed previous literature that identified different impacts of COVID-19 according to economic sectors [32,33,50,63], and H2 and H3 of this research. Furthermore, findings extend previous studies results since we contribute with new evidence of interaction effects of operating, financial and investment impact considering intra-industry variations in SMEs. Results confirmed for Spanish SMEs that exogenous shocks would simultaneously condition production, investments, and financing decisions of businesses [34].

In Table 6, comparison of the construction and services segments results shows that there are significant differences in the relationship between the operational impact of COVID-19 and the demand for normative and regulatory policies, being the path significantly higher in construction (path difference construction-services: 0.247). Reasoning for this behavior can be sustained on the need of financing resources to cover operating fix costs in construction companies since they have a higher indebtedness level [61]. Multigroup analysis also reveals that the negative impact on investment of COVID-19 exerts a higher demand for normative and regulatory policies in services than in construction companies (path difference construction-services: −0.272). Therefore, the factors that provoke the demand for these policies are different in services and construction companies. However, there are not moderating effects in the relationship between impact of COVID-19 on SMEs and the demand for competitiveness policies. These findings show evidence that partially supports H4.

Therefore, COVID-19 shock affects asymmetrically different economic sectors in Spain [68]. Findings are in accordance with traditional Business Cycle Theory that considers heterogeneity due to inter-industry variations in the context of unexpected shocks. Besides, also are in line with more recently literature of Multi-Industry Real Business Cycle dynamic stochastic models that identified a different degree of inter-sectoral comovements behavior, highlighting that industry-specific shocks are significantly more important than previously assumed [58]. However, policies implemented by the Spanish government under the UE extraordinary program from the European Commission addressed to SMEs, have not taken into account the specificities of each economic sector. An initial program was based on a financial package in the form of repayable advances, guarantees on loans, discounts on the interest rates of loans or other repayable instruments, and recapitalization measures (allowing the temporary participation of the state in the capital of companies). Next, the government transformed initial program into subsidies or direct non-refundable aids to avoid a higher degree of indebtedness for companies without repayment capacity. Additionally, the national authorities also prepared an exceptional tax legislation to allow SMEs applying temporary deferrals for the payment of taxes or social security contributions, the suspension of tax duties and accelerated tax refunds.

5. Discussion and conclusions

Recent studies regarding the impact of COVID-19 on business activity agree that providing the right public policies are crucial to support SMEs, in order to supply the minimum resources not to fail during the pandemic period and to adapt their business model to "new normal" [24]. In that sense, public incentives are even more important since shutdown of businesses has been more pronounced during COVID-19 crisis than in other worldwide past shocks [101]. This research contributes to evaluate the economic impact of COVID-19 on SMEs in Spain, distinguishing among operational, financial, and investment activities, and how these impacts influence SMEs' policy preferences. To achieve this, an empirical study has been carried out on a sample of 612 Spanish SMEs.

In the context of RBC and Shock-Based Business Cycle Theories, previous literature highlights that when assessing the impact of unexpected shocks becomes necessary to consider firm heterogeneity [50]. In that sense, previous literature identified that firms react very heterogeneously among different production sectors [29–31]. Particularly, in the context of the EU the impact of macroeconomic shocks varies across countries and sectors due to different degrees of heterogeneity [31]. According to the findings, firstly, the COVID-19 crisis has had a negative impact on the operating activities of SMEs, which, in turn, has negatively affected their investment and financing activities. This result demonstrates the cause of these financial and investment problems, identifying the weak points that must be addressed in order to improve the situation in a sustainable way. This crisis caused a shock that has generated a sharp drop in demand and a breakdown in supply chains. This shock created liquidity problems for SMEs, which have seen many of their planned investments paralyzed. The companies most affected by this negative operating impact are the youngest companies, which export a higher percentage of their sales, family companies and companies that have benefited from TERs. The companies that suffer the greatest negative effects from the crisis are those that have less experience; that is, the youngest companies, which are more likely to suffer greater negative impacts on their operational activities. Consequently, the younger the company, the greater the negative impact on sales, business operations, and the behavior of their client portfolios. This impact intensifies in proportion to the amount a company exports. Given the global dimension of the crisis, those companies that export a significant percentage of their sales have shown greater fragility in operational terms. The family nature of SMEs has an intensifying effect on the negative impact that COVID-19 has had on operational activity. This result implies that family businesses perceive that they are more operationally sensitive to external shocks, such as the one that occurred with COVID-19. Therefore, the characteristics of family businesses create barriers which impede their adaptation and flexibility to the new needs and conditions established by this scenario.

Secondly, the greater the negative impact on investment and financing, the greater SMEs' demands for policies aimed at improving the competitiveness of companies. These policies are demanded by SMEs that suffer negative impacts on their investments, their financing, and their operating activities, in the latter case, indirectly. However, despite the importance that policies aimed at competitiveness have in the survival of SMEs, they are not the most frequently requested. Indeed, the coefficients of the model show that financial and regulatory policies are the ones that SMEs most often demand. However, this result should not be interpreted in the short term, since this model shows operational problems that must be contrasted with medium- and long-term perspectives as a relevant origin. Consequently, in policy design, competitiveness policies characterized by an effect on the company in the medium to long term must occupy the place they deserve. When analyzing the characteristics of the companies that demand more financial and regulatory policies, the results reveal that once the effects of negative operational, financial, and investment impact have been introduced, these types of policies are more frequently requested by smaller companies, family businesses, and those with the fewest exports. The analysis of the demand for competitive policies does not yield significant characterizing variables. Therefore, this demand is fundamentally explained by the impacts caused by COVID-19 in financial terms, on investment, and on operational activity, in this case, indirectly.

Multigroup analysis showed significant differences in the paths between the groups when considering the inter-industry behavior of SMEs. In that sense, negative operating impacts of COVID-19 affect in a different extent investment impact, being more important in manufacturing than in services companies, while investment negative impact is more intensified by the negative impact of financial activity in construction and services companies than in manufacturing ones. Similarly, differences are also found between services and construction subsample when considering how operating and investment impacts the demand for normative and financial policy. These findings confirm how COVID-19 shock affects asymmetrically different economic sectors in Spain [68]. As a consequence, results suggest that Spanish SMEs require customized different normative and financial policies from public authorities. In fact, Spain, as well as other European countries, have implemented a wide spectrum of measures to cover SMEs from the COVID-19 impact. These have been developed per each country under the European Commission program, Temporary Framework regarding state aid measures aimed at supporting the economy in the context of the current COVID-19 outbreak. Concretely, Spanish government adopted public policies grouped in three directions: 1. Flexibilization of labor market and subsidize temporarily unemployed workers (TER); 2. Public funding for companies and self-employed workers in terms of non-refundable grants, loans and guarantees, deferred taxes and social contributions to help facing liquidity problems of companies; 3. Social policies for most vulnerable population (households' minimum income) [66]. Findings show that previous public policies should be adapted to specificities of different economic sectors.

Worldwide public policies to overcome the impact of COVID-19 in SMEs comprises monetary policies (monetary stimulus package and monetary intervention to control balance of payment and exchange rate), fiscal policies (reducing and deferring tax), social policies (assistance programs, social insurance), and labor policies (exemptions of social security, temporary employment regulation, subsidies for employees). There is a consensus that recognized the need of SMEs be assisted through governmental supporting public policies to avoid bankruptcy, since saving SMEs is crucial to sustain employment and gross product in worldwide economies [24,32,102]. However, public policies are neither equal nor synchronized in other countries. In fact, according to Sarkodie & Owusu [32] the top average response to COVID-19 crisis in terms of economic policy correspond to US, Sweden, UK, Oman and New Zealand. In the European context, the UK governmental policies include an 80% coverage funding scheme to help SMEs to pay wages during lockdown

and an exceptional lending and deferred loan programs to avoid cash pressures for impacted companies. There are also policies to adapt the business models to new forms of selling, such as online through internet [24]. In America, the US public authorities approved the CARES program to help companies to overcome the crisis fostering liquidity through loan instruments [50].

In other cross-cultural contexts, China government helps companies to implement proactive strategies to face the pandemic crisis by promoting the adoption to online channels instead of traditionally used offline physical channels [103]. In the case of South Africa, according to De Villiers et al. [104] reaction from public authorities included the intervention in the bond market to increase liquidity and a public monetary policy to promote consumption, as well as helping the banking sector to provide funds to SMEs with special conditions. Razumovskaia et al. [105] studied the impact of COVID-19 crisis on SMEs in Russia. They reported that the government implemented an anti-crisis package of policies to support businesses. The policies considered tax, administrative, banking and financial funding for SMEs. However, authors studied that the most effective measure to recover and fight against the economic effects of the pandemic is public funding to SMEs. In contrast, supporting policies of deferred tax payments, lowering interest rates and insurance expenses, deferred tax audits and bankruptcy obligations are less effective.

The results of this paper have important practical implications for SMEs and for public administrations when establishing their policies. From the SME perspective, the results have useful implications for management. Managers are shown how the crisis has impacted the different activities of their organizations, and the results can give them guidelines to apply to strategies that favor their competitiveness and survival. Regarding public policies, they can assist policymakers to identify the weakest companies and economic sectors most affected by external shocks and, thus, design more efficient programs to favor the survival of SMEs.

Our work is not without limitations that may open avenues for future research. In the first place, the size of the sample has not allowed us to delve deep enough to consider the impact on the sectors most affected or most favored by the COVID-19 crisis. We were not able to collect information from the touristic sector. During the research field period all touristic SMEs (hospitality, accommodation, restaurants) were lockdown. This is an important fact that provides an avenue for future research. Second, this study has evaluated the short-term impact of COVID-19 and the preferences that SMEs have for the public policies that should be adopted. However, this crisis will have a longer-term scope, and future research should focus on analyzing how SMEs adapt their strategies to emerge more competitively strengthened from the crisis and analyze the reasons why many SMEs have had to close their businesses. Finally, it is necessary to undertake the impact of this crisis on financial markets and its possible long-term impact on SME financing and cost of capital [75].

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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ANNEX 1. Measurement model invariance assessment MICOM Sector

Measurement Model	Configural invariance	Compositional Invariance assessment			Full measurement model invariance assessment					
		Original Correlation	0.05	Compositional invariance (Partial measurement invariance)	Mean Difference	Confidence interval	Equality means	Variance difference	Confidence interval	Equality of variances
Panel A: Manufacturing_Construction										
Operating impact	Verified	0.999	0.998	Verified	−0.109	(-0.215; 0.201)	Yes	0.432	(-0.252; 0.261)	No
Financial impact	Verified	0.998	0.997	Verified	−0.235	(-0.002; −0.203)	No	0.068	(-0.218; 0.241)	Yes
Investment impact	Verified	0.994	0.993	Verified	−0.154	(-0.201; 0.203)	Yes	0.1659	(-0.223; 0.272)	Yes
Competitivenes policy	Verified	0.999	0.955	Verified	−0.320	(-0.200; 0.195)	No	0.295	(-0.2034; 0.270)	No
Financial policy	Verified	0.996	0.996	Verified	−0.341	(-0.203; 0.201)	No	0.417	(-0.292; 0.365)	No
Age	Verified	1.000	1.000	Verified	0.613	(-0.220; 0.196)	No	1.110	(-0.673; 0.752)	No
Size	Verified	1.000	1.000	Verified	0.365	(-0.206; 0.205)	No	0.462	(-0.444; 0.539)	Yes
Exports	Verified	1.000	1.000	Verified	0.584	(-0.208; 0.210)	No	1.571	(-0.365; 0.480)	No
Familiy firm	Verified	1.000	1.000	Verified	0.138	(-0.201; 0.206)	Yes	−0.117	(-0.169; 0.202)	Yes
TER	Verified	1.000	1.000	Verified	0.235	(-0.202; 0.204)	No	0.082	(-0.041; 0.069)	No

(*continued on next page*)

(*continued*)

Measurement Model	Configural invariance	Compositional Invariance assessment			Full measurement model invariance assessment					
		Original Correlation	0.05	Compositional invariance (Partial measurement invariance)	Mean Difference	Confidence interval	Equality means	Variance difference	Confidence interval	Equality of variances
Panel B: Manufacturing_Services										
Operating impact	Verified	1.000	0.998	Verified	0.203	(-0.157; 0.156)	No	0.161	(-0.169; 0.172)	No
Financial impact	Verified	0.999	0.998	Verified	−0.027	(-0.154; 0.150)	Yes	0.097	(-0.176; 0.155)	Yes
Investment impact	Verified	0.996	0.994	Verified	0.205	(-0.157; 0.156)	No	0.141	(-0.177; 0.156)	Yes
Competitivenes policy	Verified	0.962	0.958	Verified	−0.281	(-0.141; 0.144)	No	0.230	(-0.215; 0.216)	No
Financial policy	Verified	0.999	0.997	Verified	−0.159	(-0.157; 0.156)	No	0.217	(-0.249; 0.252)	Yes
Age	Verified	1.000	1.000	Verified	0.446	(-0.150; 0.154)	No	0.776	(-0.516; 0.493)	No
Size	Verified	1.000	1.000	Verified	0.583	(-0.142; 0.160)	No	0.817	(-0.471; 0.440)	No
Exports	Verified	1.000	1.000	Verified	0.555	(-0.149; 0.158)	No	1.000	(-0.392; 0.337)	No
Familiy firm	Verified	1.000	1.000	Verified	0.129	(-0.162; 0.147)	Yes	−0.111	(-0.128; 0.124)	Yes
TER	Verified	1.000	1.000	Verified	0.478	(-0.146; 0.157)	No	0.289	(-0.112; 0.105)	No
Panel C: Construction_Services										
Operating impact	Verified	0.999	0.993	Verified	0.319	(-0.182; 0.171)	No	−0.270	(-0.224; 0.197)	No
Financial impact	Verified	0.999	0.997	Verified	0.224	(-0.193; 0.179)	No	0.038	(-0.220; 0.207)	Yes
Investment impact	Verified	1.000	0.988	Verified	0.348	(-0.176; 0.186)	No	0.019	(-0.219; 0.202)	Yes
Competitivenes policy	Verified	0.998	0.957	Verified	0.068	(-0.185; 0.180)	Yes	−0.081	(-0.303; 0.260)	Yes
Financial policy	Verified	0.995	0.992	Verified	0.197	(-0.197; 0.180)	Yes	−0.204	(-0.376; 0.301)	Yes
Age	Verified	1.000	1.000	Verified	−0.290	(-0.179; 0.191)	No	−0.334	(-0.454; 0.396)	Yes
Size	Verified	1.000	1.000	Verified	0.205	(-0.188; 0.183)	No	0.355	(-0.978; 0.689)	Yes
Exports	Verified	1.000	1.000	Verified	−0.124	(-0.190; 0.194)	Yes	−0.571	(-0.820; 0.601)	Yes
Familiy firm	Verified	1.000	1.000	Verified	−0.007	(-0.177; 0.191)	Yes	0.005	(-0.161; 0.106)	Yes
TER	Verified	1.000	1.000	Verified	0.244	(-0.205; 0.184)	No	0.207	(-0.248; 0.163)	No

Results are computed on a one-tailed permutation test at 5% confidence level.

References

[1] F. Eggers, Masters of disasters? Challenges and opportunities for SMEs in times of crisis, J. Bus. Res. 116 (May) (2020) 199–208, https://doi.org/10.1016/j.jbusres.2020.05.025.

[2] N. Donthu, A. Gustafsson, Effects of COVID-19 on business and research, J. Bus. Res. 117 (June) (2020) 284–289, https://doi.org/10.1016/j.jbusres.2020.06.008.

[3] Banco de España, Escenarios macroeconómicos de referencia para la economía española tras el Covid-19, vol. 2, Boletín Económico, 2020.

[4] H. Ding, H. Fan, S. Lin, COVID-19, firm exposure, and firm value: a tale of two lockdowns, SSRN Electron. J. (2020) 1–25, https://doi.org/10.2139/ssrn.3574401.

[5] H. Shen, M. Fu, H. Pan, Z. Yu, Y. Chen, The impact of the COVID-19 pandemic on firm performance, Emerg. Mark. Finance Trade 56 (10) (2020) 2213–2230, https://doi.org/10.1080/1540496X.2020.1785863.

[6] DIRCE, Directorio Central de Empresas, INE. Spain, 2020.

[7] BBVA Research, Impacto del Covid-19 en la economía: la inacción es más peligrosa que la sobrerreacción, tanto para la salud pública como para la economía, 2020. https://www.bbva.com/wp-ontent/uploads/2020/03/ImpactoCovid19Economia.pdf.

[8] Boston Consulting Group, Covid-19 BCG Perspectives. Facts, Scenarios, and Actions for Business Leaders, 2020. https://media-publications.bcg.com/BCG-COVID-19-BCG-Perspectives.pdf.

[9] CaixaBank Research, Crisis Covid-19: Un Shock Sin Precedentes, 2020. https://www.caixabankresearch.com/es/economia-y-mercados/politica-monetaria/crisis-covid-19-shock-sin-precedentes.

[10] Deloitte, Impacto y Escenarios de recuperación en Consumo y Distribución, 2020. https://www.cest.org/informe-de-deloitte-covid-19-impacto-y-escenarios-de-recuperacion-en-consumo-y-distribucion-27-03-20/.

[11] IMF, Regional Economic Outlook: Europe, 2020. October 2020.

[12] OECD, Coronavirus (COVID-19): SME Policy Responses, 2020.

[13] PWC, Guía para la gestión empresarial de la crisis generada por el COVID-19, 2020. https://www.pwc.es/es/covid-19/guia-gestion-empresarial-crisis-covid19.html.
[14] M. Ranjbari, Z.S. Esfandabadi, M.C. Zanetti, S.D. Scagnelli, P.O. Siebers, M. Aghbashlo, W. Peng, F. Quatraro, M. Tabatabaei, Three pillars of sustainability in the wake of COVID-19: a systematic review and future research agenda for sustainable development, J. Clean. Prod. 297 (2021) 126660.
[15] World Bank, La economía en los tiempos del Covid-19, 2020. https://openknowledge.worldbank.org/bitstream/handle/10986/33555/9781464815706.pdf?sequence=10&isAllowed=y.
[16] R. Brown, The impact of covid-19 on scottish small and medium- sized enterprises (SMEs): prognosis and policy prescription, Econ. Comment. 44 (June) (2020) 1–15. www.arjhss.com.
[17] M. Hossain, The effect of the Covid-19 on sharing economy activities, J. Clean. Prod. 280 (2021) 124782.
[18] M. Deschryvere, M. Mikkola, S. Conn, On the structural barriers to public innovation support for SMEs and the opportunity COVID-19 can offer to overcome these barriers, J. Innov. Manag. 8 (2) (2020) 16–25, https://doi.org/10.24840/2183-0606_008.002_0003.
[19] Á.L. Dias, E.C. Manuel, G. Dutschke, R. Pereira, L. Pereira, Economic crisis effects on SME dynamic capabilities, Int. J. Learn. Change 13 (1) (2021) 63–80, https://doi.org/10.1504/IJLC.2021.111662.
[20] T. Morgan, S. Anokhin, L. Ofstein, W. Friske, SME response to major exogenous shocks: the bright and dark sides of business model pivoting, Int. Small Bus. J. 38 (5) (2020) 369–379.
[21] M. Portuguez Castro, M.G. Gómez Zermeño, Being an entrepreneur post-COVID-19 – resilience in times of crisis: a systematic literature review, J. Entrepreneur. Emerg. Econ. (2020), https://doi.org/10.1108/JEEE-07-2020-0246 ahead-of-print.
[22] M. Shafi, J. Liu, W. Ren, Impact of COVID-19 pandemic on micro, small, and medium-sized Enterprises operating in Pakistan, Res. Global. 2 (2020) 100018, https://doi.org/10.1016/j.resglo.2020.100018.
[23] Indriastuti M. Winarsih, K. Fuad, Impact of covid-19 on digital transformation and sustainability in small and medium enterprises (SMEs): a conceptual framework, in: L. Barolli, A. Poniszewska-Maranda, T. Enokido (Eds.), Complex, Intelligent and Software Intensive Systems. CISIS 2020. Advances in Intelligent Systems and Computing, vol. 1194, Springer, Cham, 2021, https://doi.org/10.1007/978-3-030-50454-0_48.
[24] M. Cowling, R. Brown, A. Rocha, Did you save some cash for a rainy COVID-19 day? The crisis and SMEs, Int. Small Bus. J. 38 (7) (2020) 593–604.
[25] A. De Massis, E. Rondi, COVID-19 and the future of family business research, J. Manag. Stud. 57 (8) (2020) 1727–1731.
[26] S.A. Zahra, International entrepreneurship in the post Covid world, J. World Bus. 56 (1) (2021) 101143.
[27] M. Cepel, B. Gavurova, J. Dvorský, J. Belas, The impact of the COVID-19 crisis on the perception of business risk in the SME segment, J. Int. Stud. 13 (3) (2020) 248–263.
[28] X. Cirera, M. Cruz, E. Davies, A. Grover, L. Iacovone, J.E.L. Cordova, D. Medvedev, F.O. Maduko, G. Nayyar, S.R. Ortega, J. Torres, Policies to support businesses through the COVID-19 shock: a firm level perspective, Covid Econ. 64 (January 2021) (2021) 42–72.
[29] G. Bäurle, E. Steiner, How do individual sectors respond to macroeconomic shocks? A structural dynamic factor approach applied to Swiss data, Swiss J. Econ. Statis. 151 (3) (2015) 167–225.
[30] G.M. Caporale, Sectoral shocks and business cycles: a disaggregated analysis of output fluctuations in the UK, Appl. Econ. 29 (11) (1997) 1477–1482.
[31] A. Rathke, S. Streicher, J.E. Sturm, How similar are country-and sector-responses to common shocks within the euro area? J. Int. Money Finance (2020) 102313.
[32] S.A. Sarkodie, P.A. Owusu, Global assessment of environment, health and economic impact of the novel coronavirus (COVID-19), Environ. Dev. Sustain. 23 (2021) 5005–5015.
[33] Y. Saleh, ICT, social media and COVID-19: evidence from informal home-based business community in Kuwait City, J. *Enterprising Communities People Places Glob. Econ.* 15 (3) (2021) 395–413.
[34] K.J.K. Tan, Q. Zhou, Z. Pan, R. Faff, Business shocks and corporate leverage, J. Bank. Finance 131 (2021) 106208.
[35] P.A. McLaughlin, T. Richards, Small Business Recovery after Covid-19 (May 6, 2020), Mercatus Special Edition Policy Brief, 2020, https://doi.org/10.2139/ssrn.3595311. https://ssrn.com/abstract=3595311.
[36] Cambridge University, University of Cambridge Outbreak Covid-19 Response Plan, 2020. https://www.cam.ac.uk/sites/www.cam.ac.uk/files/university_of_cambridge_outbreak_response_plan_version_3.0_29.10.20.pdf.
[37] M. De Jong, A.T. Ho, Emerging fiscal health and governance concerns resulting from COVID-19 challenges, J. Public Budg. Account. Financ. Manag. 33 (1) (2020) 1–11, https://doi.org/10.1108/JPBAFM-07-2020-0137.
[38] M. Cucculelli, V. Peruzzi, Innovation over the industry life-cycle. Does ownership matter? Res. Pol. 49 (1) (2020) 103878.
[39] S. Chatterjee, From cycles to shocks: progress in business cycle theory, Bus. Rev. 3 (2000) 27–37.
[40] N. Kiyotaki, A perspective on modern business cycle theory, FRB Richmond Econ. Quarter. 97 (3) (2011) 195–208.
[41] D. Bonciani, M. Ricci, The international effects of global financial uncertainty shocks, J. Int. Money Finance 109 (2020) 102236.
[42] J. Fernández-Villaverde, P.A. Guerrón-Quintana, Uncertainty shocks and business cycle research, Rev. Econ. Dynam. 37 (2020) S118–S146.
[43] A.W. Gregory, G.W. Smith, Business cycle theory and econometrics, Econ. J. 105 (433) (1995) 1597–1608.
[44] D. Bonciani, B. Van Roye, Uncertainty shocks, banking frictions and economic activity, J. Econ. Dynam. Control 73 (2016) 200–219.
[45] F. Milani, A. Rajbhandari, Observed expectations, news shocks, and the business cycle, Res. Econ. 74 (2) (2020) 95–118.
[46] S.R. Baker, N. Bloom, S.J. Terry, Using Disasters to Estimate the Impact of Uncertainty, National Bureau of Economic Research, 2020. Working Paper 27167.
[47] S. Zubair, R. Kabir, X. Huang, Does the financial crisis change the effect of financing on investment? Evidence from private SMEs, J. Bus. Res. 110 (January) (2020) 456–463, https://doi.org/10.1016/j.jbusres.2020.01.063.
[48] A.K. Dixit, R.S. Pindyck, Investment under Uncertainty, Princeton University Press, Princeton, NJ, 1994.
[49] T. Papadopoulos, K.N. Baltas, M.E. Balta, The use of digital technologies by small and medium enterprises during COVID-19: implications for theory and practice, Int. J. Inf. Manag. 55 (2020) 102192, https://doi.org/10.1016/j.ijinfomgt.2020.102192.
[50] A.W. Bartik, M. Bertrand, Z. Cullen, E.L. Glaeser, M. Luca, C. Stanton, The impact of COVID-19 on small business outcomes and expectations, Proc. Natl. Acad. Sci. Unit. States Am. 117 (30) (2020) 17656–17666.
[51] V. Ratten, Coronavirus (covid-19) and entrepreneurship: changing life and work landscape, J. Small Bus. Enterpren. 32 (5) (2020) 503–516.
[52] F. Corredera-Catalán, F. di Pietro, A. Trujillo-Ponce, Post-COVID-19 SME financing constraints and the credit guarantee scheme solution in Spain, J. Bank. Regul. (2021) 1–11.
[53] A.D. Alonso, S.K. Kok, A. Bressan, M. O'Shea, N. Sakellarios, A. Koresis, L.J. Santoni, COVID-19, aftermath, impacts, and hospitality firms: an international perspective, Int. J. Hospit. Manag. 91 (2020) 102654.
[54] Andrieu, Staglianò, Van Der Zwan, Bank debt and trade credit for SMEs in Europe: firm-, industry-, and country-level determinants, Small Bus. Econ. 51 (1) (2018) 245–264.
[55] T.C. Fort, J. Haltiwanger, R.S. Jarmin, J. Miranda, How firms respond to business cycles: the role of firm age and firm size, IMF Econ. Rev. 61 (3) (2013) 520–559.
[56] L. Veldkamp, J. Wolfers, Aggregate shocks or aggregate information? Costly information and business cycle comovement, J. Monetary Econ. 54 (2007) 37–55.
[57] M. Horvath, Sectoral shocks and aggregate fluctuations, J. Monetary Econ. 45 (1) (2000) 69–106.
[58] E. Atalay, How important are sectoral shocks? Am. Econ. J. Macroecon. 9 (4) (2017) 254–280.
[59] J.R. Neill, The impact of sectoral shocks on an efficiency wage equilibrium, Q. Rev. Econ. Finance (2020).
[60] D. Arditi, R. Chotibhongs, Issues in subcontracting practice, J. Construct. Eng. Manag. 131 (8) (2005) 866–876.
[61] G. Hall, P. Hutchinson, N. Michaelas, Industry effects on the determinants of unquoted SMEs' capital structure, Int. J. Econ. Bus. 7 (3) (2000) 297–312.
[62] R.J. Oviedo-Haito, J. Jiménez, F.F. Cardoso, E. Pellicer, Survival factors for subcontractors in economic downturns, J. Construct. Eng. Manag. 140 (3) (2014), 04013056.

[63] J. Juergensen, J. Guimón, R. Narula, European SMEs amidst the COVID-19 crisis: assessing impact and policy responses, J. Indus. Bus. Econ. 47 (3) (2020) 499–510, https://doi.org/10.1007/s40812-020-00169-4.
[64] S.C. Qiu, J. Jiang, X. Liu, M.H. Chen, X. Yuan, Can corporate social responsibility protect firm value during the COVID-19 pandemic? Int. J. Hospit. Manag. 93 (2021) 102759.
[65] H. Liu, Y. Wang, D. He, C. Wang, Short term response of Chinese stock markets tothe outbreak of COVID-19, Appl. Econ. (2020), https://doi.org/10.1080/00036846.2020.1776837.
[66] A. De la Fuente, The economic consequences of Covid in Spain and how to deal with them, Appl. Econ. Anal. 29 (85) (2021) 90–104.
[67] L. Pedauga, F. Sáez, B.L. Delgado-Márquez, Macroeconomic lockdown and SMEs: the impact of the COVID-19 pandemic in Spain, Small Bus. Econ. (2021) 1–24.
[68] I. Arbulu, M. Razumova, J. Rey-Maquieira, F. Sastre, Can domestic tourism relieve the COVID-19 tourist industry crisis? The case of Spain, J. Destin. Market. Manag. 20 (2021) 100568.
[69] J. Henseler, C. Ringle, M. Sarstedt, Testing measurement invariance of composites using partial least squares, Int. Market. Rev. 33 (3) (2016) 405–431, https://doi.org/10.1108/IMR-09-2014-0304.
[70] S.L.S. Nwachukwu, S.J. Vitell, F.W. Gilbert, J.H. Barnes, Ethics and social responsibility in marketing: an examination of the ethical evaluation of advertising strategies, J. Bus. Res. 39 (2) (1997) 107–118, https://doi.org/10.1016/S0148-2963(96)00146-4.
[71] P.M. Podsakoff, D.W. Organ, Self-reports in organizational research: problems and prospects, J. Manag. 12 (4) (1986) 531–544, https://doi.org/10.1177/014920638601200408.
[72] M. Giannacourou, M. Kantaraki, V. Christopoulou, The perception of crisis by Greek SMEs and its impact on managerial practices, Procedia-Soc. Behav. Sci. 175 (2015) 546–551, https://doi.org/10.1016/j.sbspro.2015.01.1235.
[73] P.A. Geroski, P. Gregg, Coping the recession, Natl. Inst. Econ. Rev. 146 (1) (1993) 64–75.
[74] J. Soininen, K. Puumalainen, H. Sjögrén, P. Syrjä, The impact of global economic crisis on SMEs: does entrepreneurial orientation matter? Manag. Res. Rev. 35 (10) (2012) 927–944, https://doi.org/10.1108/01409171211272660.
[75] J.W. Goodell, COVID-19 and finance: agendas for future research, Finance Res. Lett. 35 (March) (2020), https://doi.org/10.1016/j.frl.2020.101512.
[76] V. Vermoesen, M. Deloof, E. Laveren, Long-term debt maturity and financing constraints of SMEs during the global financial crisis, Small Bus. Econ. 41 (2) (2013) 433–448, https://doi.org/10.1007/s11187-012-9435-y.
[77] A. D'Amato, Capital structure, debt maturity, and financial crisis: empirical evidence from SMEs, Small Bus. Econ. 55 (2019) 919–941.
[78] K. Ogawa, T. Tanaka, The global financial crisis and small-and medium-sized enterprises in Japan: how did they cope with the crisis? Small Bus. Econ. 41 (2) (2013) 401–417, https://doi.org/10.1007/s11187-012-9434-z.
[79] A. Buca, P. Vermeulen, Corporate investment and bank-dependent borrowers during the recent financial crisis, J. Bank. Finance 78 (May) (2017) 164–180, https://doi.org/10.1016/j.jbankfin.2017.02.004.
[80] X. Liu, Impacts of the Global Financial Crisis on Small and Medium Enterprises in the People's Republic of China (December 16, 2009), 2009, https://doi.org/10.2139/ssrn.1627967. ADBI Working Paper No. 180, Available at: SSRN: https://ssrn.com/abstract=1627967.
[81] OECD, Policy Responses to the Economic Crisis: Investing in Innovation for Long-Term Growth, 2009. June, https://www.oecd.org/sti/42983414.pdf.
[82] N. Boukas, V. Ziakas, Impacts of the global economic crisis on Cyprus tourism and policy responses, Int. J. Tourism Res. 15 (2013) 329–345, https://doi.org/10.1002/jtr.
[83] https://erc.metu.edu.tr/en/system/files/menu/series14/1417.pdf, 2014.
[84] H. Ba, H. Le, T. Loan, C. Thanh, T. Bich, T. Pham, T. Binh, Policy related factors affecting the survival and development of SMEs in the context of Covid 19 pandemic, Manag. Sci. Lett. 10 (2020) 3683–3692, https://doi.org/10.5267/j.msl.2020.6.025.
[85] H. Guo, Z. Yang, R. Huang, A. Guo, The digitalization and public crisis responses of small and medium enterprises: implications from a COVID-19 survey, Front. Bus. Res. China 14 (1) (2020) 1–25.
[86] C.A. Varum, V.C. Rocha, Employment and SMEs during crises, Small Bus. Econ. 40 (1) (2013) 9–25, https://doi.org/10.1007/s11187-011-9343-6.
[87] M. Peric, V. Vitezic, Impact of global economic crisis on firm growth, Small Bus. Econ. 46 (1) (2016) 1–12, https://doi.org/10.1007/s11187-015-9671-z.
[88] S.R. Chowdhury, Impact of global crisis on small and medium enterprises, Global Bus. Rev. 12 (3) (2011) 377–399.
[89] T.K. Dijkstra, J. Henseler, Consistent and asymptotically normal PLS estimators for linear structural equations, Comput. Stat. Data Anal. 81 (2015) 10–23.
[90] T.K. Dijkstra, J. Henseler, Consistent partial least squares path modeling, MIS Q. 39 (2) (2015) 297–316.
[91] W. Chin, The partial least squares approach to structural equation modelling, in: G.A. Marcoulides (Ed.), Modern Methods for Business Research, 1998, pp. 295–336.
[92] A. Tenenhaus, M. Tenenhaus, Regularized generalized canonical correlation analysis, Psychometrika 76 (2) (2011) 257–284, https://doi.org/10.1007/s11336-011-9206-8.
[93] J.F. Hair, M. Sarstedt, C.M. Ringle, S.P. Gudergan, Advanced Issues in Partial Least Squares Structural Equation Modeling, 2018 (Thousand Oaks: Sage).
[94] E.G. Carmines, R.A. Zeller, Reliability and Validity Assessment, Sage, New- bury Park, CA, 1979.
[95] G. Cepeda-Carrion, J.G. Cegarra-Navarro, V. Cillo, Tips to use partial least squares structural equation modelling (PLS-SEM) in knowledge management, J. Knowl. Manag. 23 (1) (2019) 67–89, https://doi.org/10.1108/JKM-05-2018-0322.
[96] C. Fornell, D.F. Larcker, Evaluating structural equation models with unobservable variables and measurement error, Am. Market. Assoc. 18 (1) (1981) 39–50, https://doi.org/10.2307/3151312.
[97] T.K. Dijkstra, J. Henseler, Consistent Modeling of Partial Least-Squares Trajectories. MIS Quarterly: Management Information Systems, University of Minnesota, 2015, https://doi.org/10.25300/MISQ/2015/39.2.02.
[98] J. Chu, A statistical analysis of the novel coronavirus (COVID-19) in Italy and Spain, PLoS One 16 (3) (2021), e0249037.
[99] M. Kapelko, I.M. Horta, A.S. Camanho, A.O. Lansink, Measurement of input-specific productivity growth with an application to the construction industry in Spain and Portugal, Int. J. Prod. Econ. 166 (2015) 64–71.
[100] J. López-Gracia, C. Aybar-Arias, An empirical approach to the financial behaviour of small and medium sized companies, Small Bus. Econ. 14 (1) (2000) 55–63.
[101] Arthi, Parman, Disease, downturns, and wellbeing: Economic history and the long-run impacts of COVID-19, Explor. Econ. Hist. 79 (2021).
[102] L. Lu, J. Peng, J. Wu, Y. Lu, Perceived impact of the Covid-19 crisis on SMEs in different industry sectors: evidence from Sichuan, China, Int. J. Disaster Risk Reduc. 55 (24) (2021) 102085, https://doi.org/10.1016/j.ijdrr.2021.102085.
[103] Y. Wang, A. Hong, X. Li, J. Gao, Marketing innovations during a global crisis: a study of China firms' response to COVID-19, J. Bus. Res. 116 (2020) 214–220.
[104] C. De Villiers, D. Cerbone, W. Van Zijl, The South African government's response to COVID-19, J. Public Budg. Account. Financ. Manag. 32 (5) (2020) 797–811.
[105] E. Razumovskaia, L. Yuzvovich, E. Kniazeva, M. Klimenko, V. Shelyakin, The effectiveness of Russian government policy to support smes in the COVID-19 pandemic, J. Open Innov.: Technol. Market, Compl. 6 (4) (2020) 160.

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