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Deepening the understanding of redundancy procedures in a COVID-19 context: The Spanish case

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ABSTRACT

This paper investigates the use of redundancy procedures (RPs) by small and medium-sized enterprises (SMEs) in Spain during the COVID-19 pandemic. The novelty of this study is that it goes beyond the direct influence of the determinants of RPs on RP use, and analyses how the interactions among them moderate the direct effect. In contexts of rising uncertainty, businesses need to adapt their operations and fixed costs, including staffing. While teleworking is an alternative to RPs, our results show that it was not enough to deal with the negative impact of a worsening crisis. Moreover, when the survival of the business is at stake, the use of RPs increases further when the company is simultaneously affected by changes in demand and liquidity issues. We argue that our results reveal the need for flexible tools along with the policies that take into account the fact that businesses' reactions are contingent on their exposure to risk.

KEYWORDS

COVID-19, teleworking, redundancy procedures, SMEs

JEL CLASSIFICATION INDICES

O15, K20, G30

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1. INTRODUCTION

The crisis caused by COVID-19 drove many companies to insolvency and bankruptcy. These negative effects have been more acute for small and medium-sized enterprises (SMEs). One of the most widely used measures to tackle the effects of COVID-19 on businesses has been Redundancy Procedures (RPs) (ETUC 2020; Law 2020; Hamaguchi 2020). Spain is one of the European Union (EU) countries among the most severely affected by the pandemic,[1] registering one of the highest employee infection rates and imposing the strictest lockdowns (Hackenbroich et al. 2020; Blanco et al. 2021).

Despite the extensive literature about the impact of COVID-19 on employees, there is relatively little empirical evidence in the business and management field[2] about the factors that determine the use of RPs in the pandemic, particularly for Spanish SMEs (Laborda et al. 2021; Lafuente et al. 2021; Clemente-Almendros et al. 2023). So, the objective of this study is to understand the influence of three critical crisis-related factors – teleworking, the changes in demand and the liquidity concerns – on SMEs' use of RPs. In addition, we analyse how those factors influence one another.

Government recommended teleworking (other names are working on-line or working in home office) during the pandemic, providing an efficient way for companies to adapt their structures to the new circumstances (Craig 2020; Adrjan et al. 2021). However, there is no evidence in the literature about how businesses combined teleworking with the RP instruments to tackle the effects of the pandemic.

Our study contributes to the literature in different ways. Firstly, we add to the scarce literature about RPs; indeed, as far as we know, this is the first study to examine the determinants of RPs and SMEs in the COVID-19 crisis. Secondly, we look beyond the direct relationship between RPs and these determinants and analyse how each determinant may moderate the direct effects of the others, thereby enriching our understanding of the use of RPs to respond to the potential economic downturns. Thirdly, we can learn more about how SMEs could deal with future crises, providing a reference for other EU and OECD countries.

The rest of the study is organized as follows. Section 2 presents the literature review and the development of the research hypotheses, followed by Section 3 which describes the data and the variables used. Section 4 explains the research method and the results of the study, while the last Section discusses the implications of the findings and concludes.

2. LITERATURE REVIEW AND HYPOTHESIS

SMEs were hit harder by the COVID-19 pandemic being especially vulnerable due to their size and limited resources. To counteract these negative effects many governments introduced, relaxed or extended existing RPs (Laborda et al. 2021). These procedures encouraged firms to adapt their size in terms of staff numbers.

As in many other countries, in Spain most of the adjustments in employment were done via RPs (Fernández-Cerezo et al. 2022). Since the outbreak of coronavirus, a widely used RP in all

[1]See Table A-1 and Figure A-1 in Appendix.

[2]For a worldwide review of RP measures, see Casey – Mayhew (2022).

the regions of Spain has been the measure of *Expediente de Regulación de Empleo Temporal* (ERTE). This temporary layoff scheme has received a lot of attention in the news and from employers. Legislated in Article 47 of the Workers' Statute in Spain, an ERTE is a measure through which a company can *temporarily* suspend the contract of one, several or all of its employees, with the aim of reinstating them later when the situation has stabilized and the reasons for the ERTE have been resolved. It was proposed as a solution to mitigate the complicated situation that a large number of firms were going through as a result of the pandemic. Another form of Spanish RP was the *Expediente de Regulación de Empleo (ERE)*, which was put in place more than 10 years ago and is also used in all the Spanish regions. The ERE is legislated in Article 51 of the Workers' Statute in Spain as an effective form of dismissal applied when a company is forced to shut down its activity due to a poor economic situation, or when it needs to reduce the number of staff. The employee's contract is terminated indefinitely, and the employee can benefit from the unemployment schemes.

While there are studies that analyse the impact of RPs in the COVID-19 pandemic (Brodeur et al. 2021; Laborda et al. 2021), there is a very little empirical evidence about the *effectiveness* of this policy (Adams-Prassl et al. 2020). There is thus a gap in the literature about how the companies targeted by these policies – predominantly SMEs – used RPs to adjust their labour force in response to the pandemic-related factors.

Among other government initiatives and recommendations, the use of teleworking was widely adopted by organizations (Caparrós 2022). Given the significance of this measure, many countries regulated its use: in Spain, it was regulated by Royal Decree-Law 28/2020 passed on 22nd September 2020. The objective was to preserve jobs and uphold the economy, while companies saw benefits such as cost reductions and a way of adapting to the restrictions, and many workers enjoyed a better work-life balance. Teleworking has proven to be one of the most effective factors employed in Spain to preserve jobs and ensure companies' survival (Valenzuela-García 2020). Thus, it is expected to provide an alternative to the RP measures for allowing companies to continue their activity despite the lockdown and social distancing measures. Accordingly, we expect the following relationship.

Hypothesis 1: *There is a negative correlation between the percentage of employees who are teleworking and the need to use redundancy procedures, whether temporary or permanent, to tackle the effects of the COVID-19 pandemic.*

Another effect of the COVID-19 crisis was the collapse of demand as countries restricted goods' and people's mobility. Lockdowns were implemented as the world economy suffered the most severe downturn since the Great Depression in 1929 (Habel et al. 2020). In times of recession, purchasing behaviour changes in response to the resulting uncertainty. This was clearly observed during the COVID-19 pandemic (Fairlie 2020).

The drop in demand led to lower profits and liquidity problems, threatening the survival of companies, especially SMEs. As a result, the labour market was affected too since companies needed to change and adapt their labour force to the new setting. RPs (temporary and permanent) were among the instruments used by companies for this purpose (Spurk – Straub 2020). The RP measures were created to adapt corporate labour force structures to the new type and size of demand. Following this line of thought, we expect that, as the influence of COVID-19 on customers' decisions became more severe, businesses needed to react and adapt their structures to meet the new demand, and thus, ensure their survival.

Hypothesis 2: *There is a positive correlation between the changes in demand and the need to use redundancy procedures, whether temporary or permanent, to tackle the effects of the COVID-19 pandemic.*

The unprecedented shock to business profits resulting from the COVID-19 pandemic increased liquidity risk, creating strong pressure for companies to adapt their liquidity management to deal with cash flow shortages (Almeida 2021). This problem was particularly challenging for SMEs because of their limited resources and typically high credit risk, which hindered their ability to obtain credit, in turn threatening their survival in the short-run. As such, measures helping companies to avoid these insolvency issues –particularly measures related to liquidity – had a positive effect, especially for SMEs, where productivity is critical in the crisis contexts (Guerini et al. 2020).

Since payroll costs are often the largest expense for companies, business managers seek short-term liquidity savings by implementing pay cuts, salary freezes, furlough schemes and layoffs (Huffman et al. 2021). Labour force cutback strategies are used as a way to increase efficiency and reduce costs. In the COVID-19 context, effective labour force policies, such as RPs, were called on to balance the need for short- and long-term workforce solutions. Given that SMEs need to address the burden of their fixed costs (Childs et al. 2022) and that liquidity is a critical crisis survival factor, we expect that SMEs whose liquidity was severely affected by COVID-19 used more RPs to adapt their labour force to cushion against this negative effect. We thus formulate the following hypothesis.

Hypothesis 3: *There is a positive correlation between liquidity issues and the need to use redundancy procedures, whether temporary or permanent, to tackle the effects of the COVID-19 pandemic.*

To be efficient, teleworking needs to meet some requirements at the organizational level. Effective teleworking requires the availability of a minimum level of specific physical facilities. The literature notes the need for technological resources together with control and surveillance methods (Cretan et al. 2021). Thus, an effective teleworking policy needs the company to invest economic resources and time.

As stated before, COVID-19 heightened the impact of liquidity issues, especially for SMEs that were vulnerable due to their limited resources and difficulties in securing financial resources. As a result, managing liquidity and fixed costs became crucial for SMEs' survival. When the influence of COVID-19 on SMEs' liquidity position is particularly strong, we suggest that the flexibility provided by teleworking is not enough to deal with the consequences. This is because implementing teleworking requires an investment of resources and time, which are also in short supply due to the negative impact of the crisis. As the survival of the company is at stake, it is necessary to use additional instruments, such as RPs to adapt and deal with the fixed staffing costs; indeed, these dismissal procedures are designed for this purpose (Huffman et al. 2021). Accordingly, we formulate the following hypothesis.

Hypothesis 4: *The interaction between teleworking and liquidity issues is positively associated with the need to use redundancy procedures, whether temporary or permanent, to tackle the effects of the COVID-19 pandemic.*

In the same vein, when the changes in demand – such as lower demand, pricing reduction pressures, collection delays and payment defaults (Fairlie 2020) – were severe enough to

jeopardize business survival, particularly for SMEs, then businesses were forced to react and make changes in the organization. In such a situation, teleworking was not enough to deal with the consequences, and companies needed to use the RP instruments to adapt their labour force structures to the new demand scenario (Spurk – Straub 2020). Based on this reasoning, we formulate the following hypothesis.

Hypothesis 5: *The interaction of teleworking and the changes in demand is positively associated with the need to use redundancy procedures, whether temporary or permanent, to tackle the effects of the COVID-19 pandemic.*

Analysing the use of RP measures when the changes in demand are low, we would expect to find that companies facing minor liquidity issues use RPs less than companies facing major liquidity issues. However, when the changes in demand are severe, companies facing minor and major liquidity issues significantly increase the use of RPs, with this use being greater for the latter. In any case, companies facing severe changes in demand and liquidity issues would use RPs more likely. In this vein, we formulate the following hypothesis.

Hypothesis 6: *The lesser (greater) use of redundancy procedures, whether temporary or permanent, is expected for the lowest (highest) both changes in demand and liquidity issues. However, for companies facing minor liquidity issues, a greater increase in RP use is more likely expected moving from low to high changes in demand.*

Finally, it is interesting to analyse the joint influence of the three determinants of RPs; to do so, we establish different scenarios. When the changes in demand are low, companies facing major liquidity issues would be expected to use RPs more than those facing minor liquidity issues, despite a high use of teleworking, indicating that teleworking is not enough to deal with major liquidity issues and changes in demand. This escalation in the use of different tools to tackle external factors affecting business survival has been pointed out by the literature, with businesses shown to change and adapt to the environment in times of uncertainty, affecting suppliers, customers and liquidity. However, if the changes in demand are great enough, businesses tend to use RPs regardless of the use of teleworking or liquidity concerns. Empirical evidence shows that the pandemic caused changes in customer behaviour, putting businesses at risk, and forcing them to attempt to reach their changing customers by means of different strategies (Köllő – Reizer 2021; Childs et al. 2022). In this regard, we formulate the following hypothesis.

Hypothesis 7: *The likelihood of using redundancy procedures, whether temporary or permanent, is lower for companies facing minor changes in demand and liquidity concerns, and with a low percentage of teleworking. It is higher for companies with more serious changes in demand and liquidity concerns, regardless of the percentage of teleworking.*

As a summary of our hypotheses, Figure 1 shows the model we aim to test.

3. DATA AND VARIABLES

3.1. Data

To test our hypotheses, we used data collected by interviewing SME managers in Spain in the first semester of 2021, as part of the research project "*Economic impact of COVID-19 on SMEs*

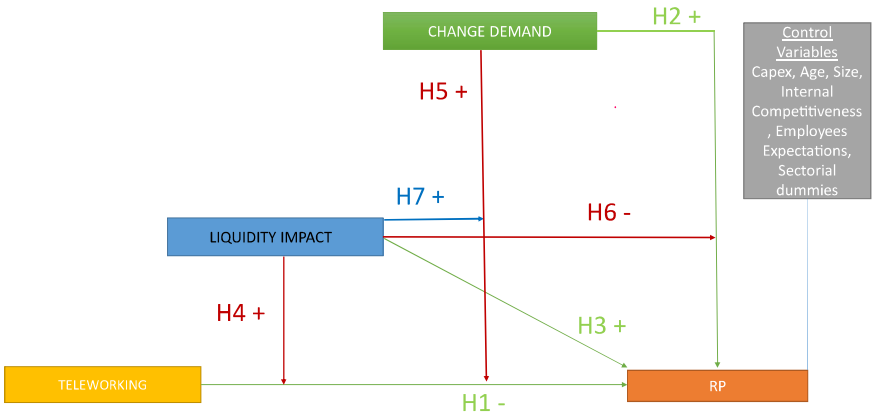

Fig. 1. Model, hypotheses and expected relationships

in Spain",[3] promoted by the "*Observatorio Iberoamericano de la MIPYME*" and FAEDPYME.[4] The design of the questionnaire ensured an appropriate procedure for collecting the statistical information needed to test our hypotheses. Stratified sampling was used for the general design of the survey. In this research, different strata were established (sector, size and region), to which we applied simple random sampling techniques. The information in our sample was gathered via telephone and online surveys because of their proven efficiency, with the highest response rate in related studies, and SME general managers were targeted as they are the key decision-makers. The final sample contained 960 Spanish SMEs. The global sampling error was 3.2% at a confidence level of 95%. Table 1 shows the sample distribution by sector and size.

Table 1. Sample distribution

	Number and %	Sampling error
Industry	259 (27.0%)	6.1
Construction	176 (18.4%)	7.4
Commerce	171 (17.8%)	7.5
Service	354 (36.8%)	5.2
Micro (6–9 Employees)	338 (35.2%)	5.3
Small (10–49 Employees)	526 (54.8%)	4.2
Medium (50–249 Employees)	96 (10.0%)	9.9
Total sample	960 (100.0%)	3.2

[3]http://faedpyme.upct.es/sites/default/files/publicaciones/145/informepymecovid2021.pdf

[4]Foundation for Strategic Analysis of SMEs.

We used Harman's one factor test to check for potential common-method bias (Podsakoff et al. 2003). Principal component analysis was applied to all the variables in our model, confirming that there is no dominant factor, and thus, that there is no evidence of this bias in our results. In addition, to test for possible non-response bias, we compared early and late respondents in our sample. No significant differences were found in terms of firm age, size and sector.

3.2. Variables

The independent variables of this research capture the main pressures stemming from COVID-19 that exerted an influence on decisions about the RP measures. Firstly, the shock created by the COVID-19 pandemic increased the liquidity risk for many companies, especially smaller firms, and heightened the importance of sound liquidity management (Almeida 2021; Ebeke et al. 2021). Due to this sizable impact on liquidity, it became critical to try to adjust fixed costs and factors of production, particularly labour (Guerini et al. 2020). Secondly, the most severe economic repercussions worldwide caused by COVID-19 were the collapse in customer demand for some goods, supply chain interruptions and a change in purchasing behaviour (Habel et al. 2020). As a result, companies suffered order cancellations, late deliveries and changes in the portfolio product offering, among other issues. Thirdly, one of the governments' main recommendations was for companies to implement teleworking as a flexible working system that could preserve jobs and maintain economic activity, as it helps companies reduce production costs. Indeed, teleworking was one of the ways in which Spanish firms managed to retain their employees.[5]

3.2.1. Dependent variable

3.2.1.1. Redundancy procedure (RP). The dependent variable is a dichotomous variable from the survey, which takes the value 1 if the company has used temporary or permanent RPs (ERE or ERTE) to tackle the effects of the pandemic, and 0 otherwise.

3.2.2. Independent variables

3.2.2.1. Percentage of employees teleworking (TELEWORKING). This is a continuous variable that measures the percentage of employees that were teleworking because of COVID-19, at the time the survey was conducted.

3.2.2.2. Changes in demand caused by COVID-19 (CHANGE DEMAND). This variable is a construct created from different survey questions measured on a 5-point Likert scale (where 1 means strongly disagree, and 5 means strongly agree) asking respondents about the negative impact of the COVID-19 crisis on factors related to customers, such as product or service modification, lowering of prices, customer collection delay, customer order cancellation, and customer default. The construct was then created using the first factor from a factor analysis of the abovementioned survey questions. Cronbach's Alpha indicates that the construct is sufficiently reliable (0.801) and the factor analysis results satisfy the criteria for construct validity (the Kaiser-Meyer-Olkin (KMO) measure is 0.819; Bartlett's test of significance is 0.000; Total Variance Explained indicates a factor that explains 55.731% of the variance).

[5]https://cincodias.elpais.com/cincodias/2020/04/30/opinion/1588259464_037539.amp.html

3.2.2.3. Impact of liquidity issues caused by COVID-19 (LIQUIDITY IMPACT). This variable is a construct created from survey questions measured on a five-point Likert scale (where 1 means strongly disagree, and 5 means strongly agree) asking about the negative impact of the COVID-19 crisis on factors related to liquidity, such as investment cancellation, risk management plan availability, and implementation of the company's liquidity management measures. The selection of these three items from the survey was based on the rotated component matrix provided by a factor analysis. The construct was then created using the first item from a factor analysis of the abovementioned survey questions. Cronbach's Alpha indicates that the construct is sufficiently reliable (0.811). The factor analysis results satisfy the criteria for construct validity (the KMO measure is 0.864; Bartlett's test of significance is 0.000; Total Variance Explained indicates a factor that explains 51.126% of the variance).

3.2.3. Control variables. In our model, we used the following control variables:

- Capital Expenditure (CAPEX) is a five-point Likert-type question in the survey (where 1 means not at all important, and 5 means very important) regarding the acquisition of new capital equipment.
- Firm age (*AGE*) measures the age of the company.
- Firm size (*SIZE*) is measured by the number of employees.
- The level of internal competitiveness compared to direct competitors (*INTERNAL COMPETITIVENESS*) is a construct created from five-point Likert-type questions in the survey (where 1 means much worse, and 5 means much better) regarding some indicators of performance in comparison with direct competitors (quality of the products, efficiency in the production processes, customer satisfaction, employee satisfaction, and work absenteeism). Cronbach's Alpha indicates that the construct is sufficiently reliable (0.756). The factor analysis results satisfy the criteria for construct validity (the KMO measure is 0.768; Bartlett's test of significance is 0.000; Total Variance Explained indicates a factor that explains 51.425% of the variance).
- Expectations of the company regarding the number of employees (*EMPLOYEES EXPECTATIONS*) is the result of a three-point Likert-type question in the survey (where 1 means expected to decline, 2 means expected to remain stable, and 3 means expected to increase).
- Finally, we added sector dummies.

3.2.4. Descriptive statistics. Descriptive statistics and correlations are shown in Table 2.

The mean value of our dependent variable is 0.436, which means that approximately 44% of our sample used RP schemes. Our sample largely consists of mature companies since the average age is 30 years. The average number of employees is 24. Correlation and multicollinearity were not a problem in our sample.

4. EMPIRICAL METHOD AND RESULTS

We tested the hypotheses using binary logistic regression models and marginal effects with STATA software v.15.1. Since our dependent variable is a dichotomous variable, we used specific indicators to analyse the goodness-of-fit of our models. First, pseudo-R^2 indicates the overall fit of the model. Next, we applied the Hosmer-Lemeshow test, which is a test of the null hypothesis

Table 2. Descriptive statistics and correlations

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9
Rp	0.436	0.496	1.000								
Change demand	0.000	0.999	0.189 (0.000)	1.000							
Liquidity impact	0.000	0.999	0.221 (0.000)	0.151 (0.000)	1.000						
Teleworking	14.345	28.745	−0.083 (0.001)	0.099 (0.000)	0.007 (0.788)	1.000					
CAPEX	1.765	1.897	−0.123 (0.000)	0.018 (0.465)	−0.064 (0.012)	0.126 (0.000)	1.000				
Age	29.571	17.795	0.051 (0.042)	0.044 (0.080)	0.021 (0.412)	−0.078 (0.002)	0.007 (0.779)	1.000			
Size	23.860	35.811	−0.034 (0.177)	−0.035 (0.169)	0.095 (0.000)	0.074 (0.003)	0.183 (0.000)	0.121 (0.000)	1.000		
Internal competitiveness	0.000	0.999	0.065 (0.010)	0.051 (0.044)	0.066 (0.010)	0.089 (0.000)	0.101 (0.000)	−0.006 (0.798)	0.033 (0.197)	1.000	
Employees expectations	1.941	0.497	0.036 (0.153)	0.208 (0.000)	−0.024 (0.352)	−0.042 (0.096)	−0.143 (0.000)	0.065 (0.010)	−0.117 (0.000)	−0.113 (0.000)	1.000

that the fitted model is correct. In this case, a *P*-value below 0.05 indicates that the model is not an acceptable fit to the data, at a 5% level of significance. Finally, the correct classification rate, measured as a percentage, indicates what proportion of the predicted outcome has been correctly classified: the higher the percentage, the better the fit of the model. We estimate marginal effects for the variables of interest to test the direct hypotheses. They are estimates of the change in the dependent variable for a change in one independent variable, holding all other variables constant. Marginal effects are the appropriate approach to test the effect of the explanatory variables on the response variable for discrete models, such as logit models, we used Average Marginal Effects (AME), as it is the most common average-case approach.

As in similar studies with logit models and moderating relationships to test the moderation hypotheses we used two-way and three-way interactions, and then graphed them.[6] Following Dawson and Richter (2006) we plotted the two-way and three-way interactions to get a better understanding of the moderation coefficients. As an alternative way to interpret the interaction effects, we followed Busenbark et al. (2022), computed, and plotted the marginal effect of the independent variables on the dependent variable for different values of the moderating variables, obtaining the same results.[7]

Table 3 shows the estimated unstandardized coefficients from our logistic regression models,[8] and the average marginal effects. The percentage of employees teleworking (TELEWORKING) has a significant negative relationship (coefficient −0.006, *P*-value 0.045) with the use of ERE or ERTE procedures (RP), confirming the negative relationship predicted in H1. We show evidence that 1% increase in the TELEWORKING variable is associated with a 0.1% decrease in the probability of the use of RPs (marginal effect value is −0.001481, *P*-value 0.042). This result suggests that teleworking provides companies with the flexibility to tackle the economic turmoil created by COVID-19. The changes in demand (coefficient 0.408, *P*-value 0.000) and liquidity concerns (coefficient 0.422, *P*-value 0.000) caused by COVID-19 have a significant positive relationship with RP, confirming H2 and H3, respectively. We show evidence that 1% increase in the CHANGE DEMAND and LIQUIDITY IMPACT variables are associated with an increase of 8.98% and 9.27%, respectively, in the probability of the use of RPs (marginal effects are 0.0897 *P*-value 0.000, and 0.0927 *P*-value 0.000, respectively). Both changes in demand and liquidity issues increase the probabilities of using RPs to reduce the economic burden of surplus employees.

The two-way interaction TELEWORKING x LIQUIDITY IMPACT has a significant and positive moderation effect (coefficient 0.008, *P*-value 0.056), confirming the prediction of H4. Liquidity issues from COVID-19 are inversely associated with the use of teleworking. Figure 2 shows that for low negative liquidity issues, teleworking can be used as a flexibility tool, and companies with high rates of teleworking are more likely to make less use of RPs. However, if the liquidity concern is severe, then the priority is liquidity; in such cases, teleworking is not enough to deal with the problem, increasing the likelihood of using RP instruments.

[6]Interaction effects do not have marginal effects of their own; thus, in the logit models, interaction plots are needed to describe the interaction effects.

[7]The plots are available on request.

[8]We obtained the same results using standardized values.

Table 3. Logistic regression coefficients

Explanatory variables	Model I		Model II	Model III	Model IV	Model V
	Coefficients	AME	Coefficients	Coefficients	Coefficients	Coefficients
TELEWORKING	−0.006** (0.003)	−0.001** (0.000)	−0.007** (0.003)	−0.009** (0.003)	−0.006** (0.003)	−0.010*** (0.003)
CHANGE DEMAND	0.408*** (0.096)	0.089*** (0.019)	0.402*** (0.095)	0.339*** (0.106)	0.421*** (0.090)	0.363*** (0.095)
LIQUIDITY IMPACT	0.422*** (0.109)	0.092*** (0.022)	0.341*** (0.118)	0.420*** (0.109)	0.432*** (0.104)	0.353*** (0.108)
TELEWORKING x LIQUIDITY IMPACT			0.008* (0.004)			0.007* (0.004)
TELWORKING x CHANGE DEMAND				0.006* (0.003)		0.003 (0.003)
CHANGE DEMAND x LIQUIDITY IMPACT					−0.216** (0.110)	−0.333*** (0.114)
TELEWORKING x CHANGE DEMAND x LIQUIDITY IMPACT						0.011*** (0.004)
CAPEX	−0.114** (0.049)	−0.025** (0.011)	−0.118** (0.050)	−0.115** (0.050)	−0.112** (0.048)	−0.118** (0.048)
AGE	0.005 (0.004)	0.001 (0.001)	0.004 (0.004)	0.005 (0.004)	0.006 (0.004)	0.004 (0.004)
SIZE	−0.001 (0.002)	−0.000 (0.000)	−0.001 (0.002)	−0.001 (0.002)	−0.001 (0.002)	−0.001 (0.002)
INTERNAL COMPETITIVENESS	0.104 (0.081)	0.022 (0.017)	0.114 (0.082)	0.101 (0.081)	0.116 (0.080)	0.116 (0.082)
EMPLOYEE EXPECTATIONS	0.053 (0.231)	0.011 (0.050)	0.047 (0.236)	0.056 (0.227)	0.048 (0.217)	0.062 (0.211)
Constant	−0.364 (0.572)		−0.290 (0.575)	−0.376 (0.563)	−0.368 (0.536)	−0.312 (0.513)
Sectorial Dummies						
Observations	YES		YES	YES	YES	YES
R2 Nagelkerke	960		960	960	960	960
Hosmer-Lemeshow Goodness-of-fit *P*-value	0.120		0.124	0.122	0.126	0.150
	0.577		0.405	0.300	0.359	0.843
Correct classification (%)	64.2%		64.7%	64.6%	64.4%	64.7%

Notes: Robust logistic regression coefficients $^{*}P < 0.10$; $^{**}P < 0.05$; $^{***}P < 0.01$. Sectorial dummies included.

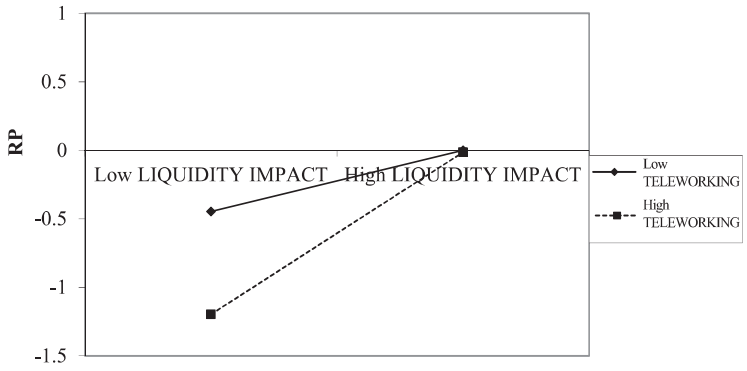

Fig. 2. TELEWORKING x LIQUIDITY IMPACT

The two-way interaction TELEWORKING x CHANGE DEMAND has a significant and positive moderation effect (coefficient 0.006, *P*-value 0.095), confirming the expected relationships of H5. Changes in demand are inversely associated with the use of teleworking. Figure 3 shows that for low changes in demand, teleworking is used as a flexibility tool; thus, companies with a high rate of teleworking are associated with lower probabilities of using RP measures. However, when the changes in demand are severe, then the priority is reducing the economic burden of the surplus employees created by these changes, and adapting the organizational structure to the new demand, increasing the probabilities of using RP instruments.

The two-way interaction CHANGE DEMAND x LIQUIDITY IMPACT has a significant and negative moderation effect (coefficient −0.216, *P*-value 0.049), confirming the expected relationships of H6. Figure 4 shows that for low changes in demand, companies suffering severe liquidity issues are more likely to use RP procedures to tackle the economic problems created by the pandemic, and vice versa for low liquidity issues. However, as the changes in demand

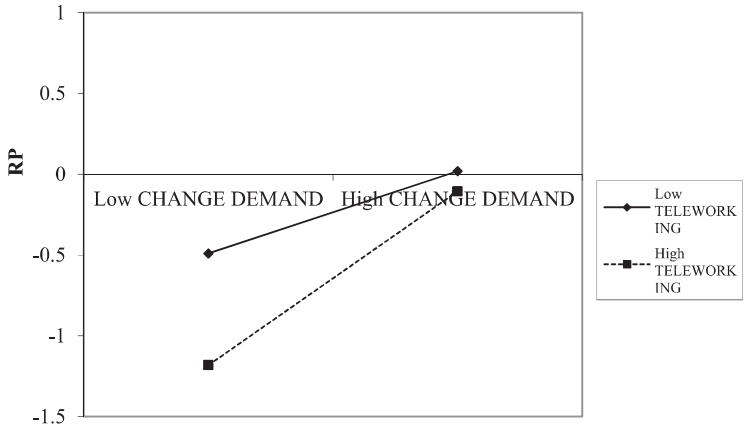

Fig. 3. TELEWORKING x CHANGE DEMAND

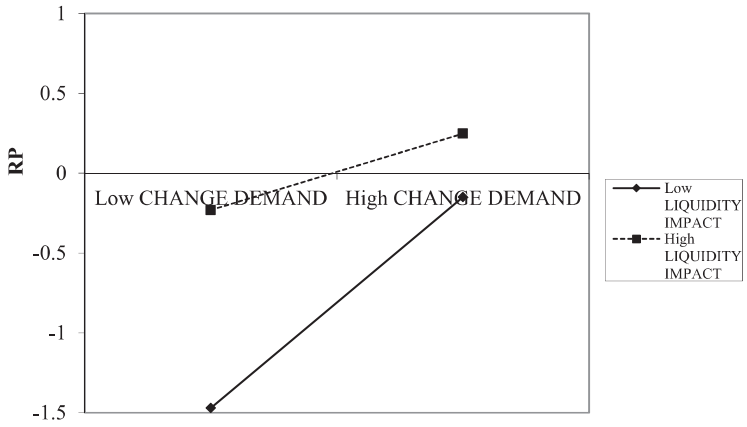

Fig. 4. CHANGE DEMAND x LIQUIDITY IMPACT

increase, companies are more likely to use RP procedures to deal with the consequences, for both a high and low level of liquidity concerns.

Finally, the three-way interaction TELEWORKING x CHANGE DEMAND x LIQUIDITY IMPACT has a significant and positive moderation effect (coefficient 0.011, *P*-value 0.005), confirming the expected relationships of H7. Changes in demand due to COVID-19 increase the likelihood of using RPs, regardless of their use of teleworking or their liquidity concerns due to COVID-19. Figure 5 shows the significant moderation coefficients from the slope analysis of the three-way interaction. This figure shows that when the changes in demand are low, a high level of liquidity concerns is associated with the use of RPs and the use of teleworking. However, when the changes in demand are high, then the likelihood of using RP increases regardless of the level of teleworking and liquidity concerns. These outcomes show that probabilities of using RP are contingent on the levels of risk in the company.

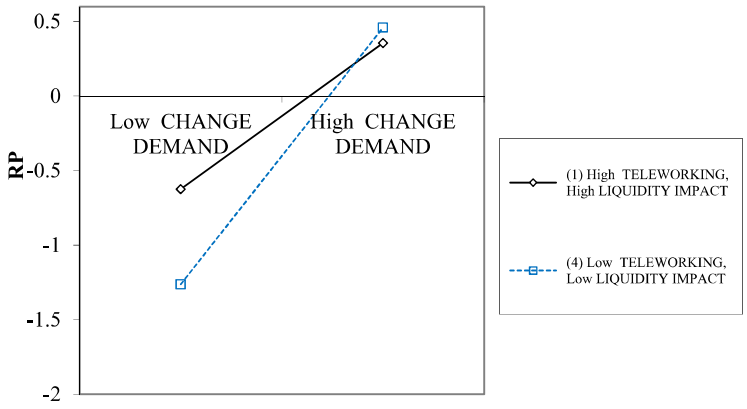

Fig. 5. TELEWORKING x CHANGE DEMAND X LIQUIDITY IMPACT

5. DISCUSSION

Our empirical findings regarding the interaction between the different issues affecting companies and measures implemented during the COVID-19 pandemic offer an understanding of the mechanisms that played a critical role during the crisis. To tackle the crisis, governments encouraged companies to use RPs, but the use of these schemes was influenced by liquidity concerns, changes in demand and teleworking, which were the key factors during the pandemic.

Our findings show that teleworking, a flexibility measure, is negatively associated with the use of RPs during the crisis. This result is in line with the literature that recommended teleworking as a good alternative to permanent dismissal during the COVID-19 crisis. Companies adapted to shifting circumstances in 2020 by changing their culture and way of working to better suit the new remote job model. This new form of working has improved the efficiency of companies and had positive business outcomes (Moens et al. 2022).

Our study reveals that the pandemic significantly affected SMEs, particularly regarding changes in demand and issues arising from liquidity shortages. As these problems became worse, SMEs increasingly relied on RPs to cope with the economic downturn. The results are in line with the literature, demonstrating that uncertainty affects both customers and suppliers, especially for SMEs and confirming the positive relationship between firm liquidity problems and RP decisions during the pandemic (Ahmad et al. 2020).

By means of moderations, we show that, as liquidity issues become more serious, a switch to teleworking was not sufficient, and businesses were more likely to use RPs. The same dynamic was identified in relation to the changes in demand and teleworking: this flexibility tool was used only when changes in demand were not life-threatening for firms.

The link between RP use and the interaction between changes in demand and liquidity issues, which has not previously been studied in the literature, offers a more complete picture of SMEs' response to the pandemic. Our findings corroborate the influence of the uncertainty generated by the pandemic on business decisions, particularly in SMEs (Fernández-Cerezo et al. 2022). The effectiveness of the RP partly depends on the intensity of the crisis and is contingent on the level of uncertainty surrounding the ability of the companies to stay operational. The adaptive responses to COVID-19 analysed in our study (teleworking and RP) try to mitigate the harmful effects of this crisis. Our findings show that the SMEs that implemented RP were the ones that were worst hit by the crisis. For low difficulties, teleworking is a good option to respond to the external crisis. As the intensity increases, the likelihood of using RP increases. Given that RPs were designed to help companies get through difficult times in terms of revenues or losses, we show that they fulfil their function. We can also conclude that the adjustment of the labour force is very sensitive to the revenue or loss outlook in SMEs.

6. CONCLUSION, IMPLICATIONS, AND LIMITATIONS

Beyond the expected negative relationship between the RP use and teleworking, and the positive relationships between the RP use and changes in demand and liquidity issues, our study reveals that the change in probabilities of using RP gradually increases as these repercussions more severely affect the viability of the business. Our moderation hypotheses show that as the changes in demand and uncertainty increase, businesses need to adapt their operations and fixed costs,

including the labour force. While teleworking is a good alternative to RPs, it is no longer enough. As the survival of the business is at stake, the probabilities of using RPs increase further when the company is simultaneously affected by changes in demand and liquidity issues.

Our results have important implications for SME managers and other stakeholders. Lessons learnt from COVID-19 could be applied to deal with any future crises. Policymakers may learn from our findings and explore more suitable flexible laws that can help companies deal with unexpected crises. They must understand the role of teleworking as a flexibility tool. However, they should also be aware of the importance of complementing these adaptive tools with public policies that allow companies to adapt their labour force in response to future crises, since teleworking may not be useful for preventing layoffs beyond a certain level of difficulties. In the design of policies aimed at reducing unemployment and increasing businesses' likelihood of survival, it is crucial to understand that company reactions are contingent on the extent of the negative effect of the external crisis.

Managers should acknowledge the flexibility of remote working. In this vein, managers must be aware of the importance of using different public policies aimed at providing businesses with flexibility regarding employment, but should also know how to use them appropriately according to the different levels of difficulties.

Our study has important implications for researchers. As shown, the direct relationships between individual variables do not paint the full picture. By using interaction effects, our findings confirm the idea that the RP use gradually increases contingent on the level of business risk. Our findings are informative for other countries in the EU and the OECD, since many also developed RPs in response to COVID-19.

The present study has some limitations. Firstly, the survey was conducted for a single year, and the sample of SMEs was restricted to the Spanish companies. Our findings can be strengthened by using a wider panel of companies and a longer time horizon. Furthermore, it would be worth conducting a cross-country comparison with other EU members, as many of these used RPs in combination with teleworking.

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Appendix

Table A-1. COVID-19 statistics for six European countries

Period 2020–2023	Sweden	Finland	Ireland	Norway	Albania	Spain
Total cases per million	259,957	270,669	343,897	276,247	117,704	293,960
Total death per million	2,473	2,050	1,865	1,054	1,267	2,562

Source: https://ourworldindata.org/coronavirus#coronavirus-country-profiles

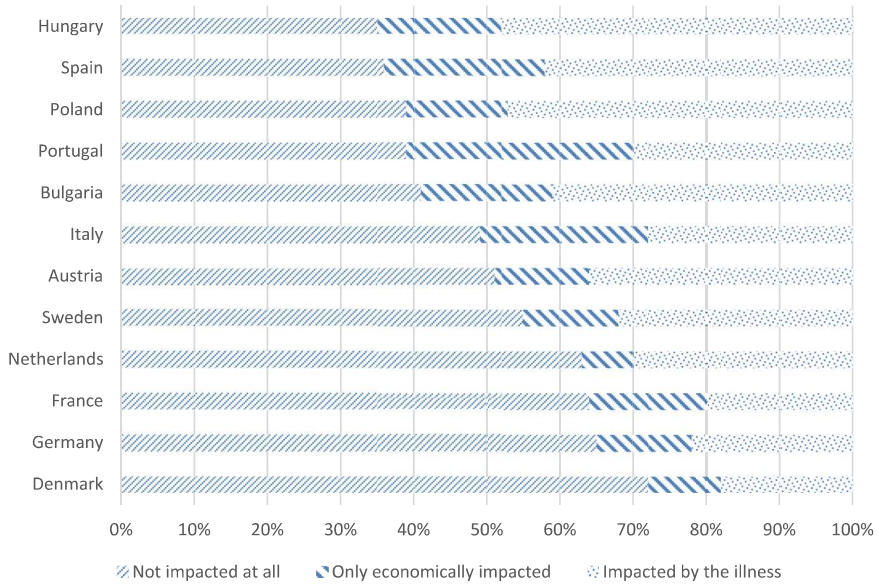

Fig. A-1. Distribution of the impact of the COVID-19 pandemic on peoples' lives in Europe, 2021
Source: https://www.statista.com/statistics/1262835/personal-impact-of-the-COVID-19-crisis-in-europe-2021/