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# How combinations of network participation, firm age and firm size explain SMEs' responses to COVID-19

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## ABSTRACT


Small- and medium-sized enterprises (SMEs) are important to the economy but vulnerable to changes in their environment. A current example of an exogenous shock threatening SMEs globally is the COVID-19 pandemic, and the firms' responses to the crisis are essential to the prosperity of national economies in the future. The purpose of this paper is therefore to investigate how different antecedent factors may explain SMEs' responses to COVID-19. This is done through an empirical study of 247 SMEs in Norway and the application of fuzzy-set qualitative comparative analysis (fsQCA), which enables a nuanced evaluation of how complex combinations of several co-existing factors can explain SMEs' responses to crises. The results demonstrate how three types of crisis responses can be explained by combinations of SMEs' participation in formal and informal networks, firm characteristics, such as firm size and firm age, and the negative impact of the crisis on the firm.

## KEYWORDS

COVID-19; fuzzy-set qualitative analysis (fsQCA); responses; social networks; crisis; small- and medium-sized enterprises (SMEs)

## Introduction

Small- and medium-sized enterprises (SMEs) are the backbone of the European economy (Juergensen et al., 2020) but are vulnerable to changes in their environment. They often do not have sufficient resources to successfully protect themselves against external threats (Etemad, 2020; Pal et al., 2014; Rehman & Anwar, 2019) but are instead dependent on their own capabilities and knowledge as well as the expertise and resources available through, for instance, networks to adapt in a turbulent environment (Smallbone et al., 2012). Managing an SME during an exogenous shock is thus not business as usual (Doern et al., 2019), and the consequences of the COVID-19 pandemic have created an economic shock surpassing that of the global financial crisis of 2007–2008 (Brown et al., 2020). While the pandemic has led to business closures and bankruptcy (Amankwah-Amoah et al., 2020), COVID-19 has also prompted the still active and surviving businesses to respond to the crisis by abruptly operating in different ways than previously (Verma & Gustafsson,

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2020). The present paper focuses on antecedents of SMEs' responses to the crisis induced by the COVID-19 pandemic.

The rapid growth of COVID-19 infections led national authorities in many countries to impose restrictions – such as lockdowns – which had severe consequences for individuals, businesses, industries and even national economies (Giones et al., 2020; Kuckertz et al., 2020). Thus, the COVID-19 pandemic has stimulated research efforts in many fields, including the management sciences (Carracedo et al., 2020; Portuguese Castro & Gómez Zermeño, 2020; Verma & Gustafsson, 2020). Recent research has taken multiple perspectives to study how small and/or entrepreneurial firms could respond or have responded to the crisis. Thorgren and Williams (2020) found that managers were reluctant to make investments that could make their firms more financially vulnerable early in the crisis and therefore favoured saving expenses and avoiding significant investments. Giones et al. (2020) suggested an increased emphasis on planning and management actions as well as leveraging informal support networks as appropriate responses to crises. Facilitation of networking activities may thus be a key policy measure, for example, to recover and grow in international markets (Juergensen et al., 2020) or find partners with the necessary knowledge to overcome challenges (Priyono et al., 2020). Crises may also accelerate existing transitions in operations and strategies (Priyono et al., 2020), for example, through business model pivoting (Morgan et al., 2020) and increased use of digital technologies (Akpan et al., 2020; Priyono et al., 2020). Crises may therefore not solely prohibit business activities because small firms and entrepreneurial individuals can potentially create or discover new opportunities during a crisis (Etemad, 2020; Ratten, 2020), for example, through the initiation of new network interactions (Giones et al., 2020).

Previous research provides an understanding of the adversity and consequences SMEs face in crises, as well as conceptual works leading to well-founded proposals for different paths SMEs may follow to survive, recover and grow. Recent empirical studies also provide insight into the actual impact of crises such as the COVID-19 pandemic on SMEs, as well as a selection of different response options firms have chosen. The literature suggests that responses to a crisis are a result of several factors, such as experience, development stage and the nature of the crisis (Doern et al., 2019). What therefore remains rather understudied is how combinations of different factors regarding the SMEs and the crisis may *explain* different types of responses to crises. Hence, the purpose of the present paper is to investigate how various antecedent factors may explain the responses of SMEs to COVID-19. The empirical work in the present paper is carried out in Norway, where lockdowns due to COVID-19 were imposed from 12 March 2020. The lockdowns abruptly affected SMEs by banning important business activities, such as face-to-face sales and marketing activities of most firms (Sørheim et al., 2020). Norway is a small open economy, and SMEs in Norway are highly dependent on international trade (Acs et al., 2015). Many Norwegian SMEs are also reliant on oil and gas sector activity, so the decrease in oil prices following the global COVID-19 outbreak (cf. Ope et al., 2021) further contributed to the rapid impact of COVID-19 on Norwegian SMEs. Thus, Norwegian SMEs have abruptly and severely been affected by the pandemic from March 2020 onwards, and Norway is therefore an interesting case to study SMEs' difficulties and challenges due to COVID-19 and their responses to the pandemic. The Norwegian government quickly initiated different support

schemes to help SMEs survive (Regjeringen, 2021).<sup>1</sup> The support schemes included faster processing of applications for loan- or grant-based financing of innovation and development activities, as well as reimbursement of direct unavoidable costs if the SME could prove a decline in revenues due to the lockdown (Regjeringen, 2021).

The following section develops a set of four propositions relating different antecedent factors to SMEs' crisis responses. The four propositions are developed with the purpose of outlining a research model to be empirically investigated in the present paper. The third section explains the study methodology, including the quantitative analysis of 247 Norwegian SMEs and the fuzzy-set qualitative comparative analysis (fsQCA) techniques applied to analyse the dataset. The analysis results follow in the fourth section, followed by the discussion and conclusion sections.

The present paper contributes to research on small business management during crises by presenting an empirical study of antecedents for SMEs' crisis management strategies (Kraus et al., 2020) and explaining why small firms respond (Morgan et al., 2020) given the unique conditions for business activities that COVID-19 has imposed globally (Sigala, 2020). The present paper also contributes methodologically by adopting fsQCA to study SMEs' responses to crises and thereby complements previous literature reviews (cf. Portuguese Castro & Gómez Zermeño, 2020), case studies (cf. Priyono et al., 2020; Salamzadeh & Dana, 2020) and quantitative studies (cf. Thorgren & Williams, 2020).

## Development of propositions and a research model for explaining crisis response

Crises represent unpredictable events that require a response from individuals, organizations and authorities (Doern et al., 2019; Herbane, 2010) with little time for decision-making (Kraus et al., 2020). While the COVID-19 pandemic represents a novel crisis situation as such, there have been several major crises in the past that have received significant attention from management scholars (Wenzel et al., 2020). It is therefore possible to build upon findings from previous crises – such as the global financial crisis of 2007–2008 (e.g. Davidsson & Gordon, 2016; Pal et al., 2014) – as well as the recent literature that considers the crisis induced by the COVID-19 pandemic. This section is based on a scoping review process (cf. Munn et al., 2018) to cover the existing literature regarding factors that previous research has found to explain or influence how SME managers respond to a crisis. Hence, the present paper can leverage and concentrate on the factors found to be influential in previous research. Nevertheless, the present paper does not account for all factors that *could potentially* explain SMEs' responses.

To leverage the benefits of using fsQCA to explore complex phenomena (cf. Kraus et al., 2018), this section develops propositions to be combined into a research model instead of hypotheses to be tested independently. The development and consequent assessment of a research model are thus helpful to consider how *combinations* of several factors (which can be thought of as independent variables) together explain an outcome (which can be thought of as a dependent variable) instead of disjoint individual relationships between each factor and the outcome. The research model takes the following generic form where the outcome is expressed as a function ( $f$ ) of a set of  $n$  factors ('factor 1, factor 2, ..., factor  $n$ '), meaning that the  $n$  factors are expected to together explain the outcome:

### ***Crisis impact and response***

Crises change customer behaviour (Carracedo et al., 2020; Pantano et al., 2020) and market structures (Donthu & Gustafsson, 2020). Brown and Rocha (2020) found that the COVID-19 crisis led to a decrease in financing for SMEs. Such impacts force SMEs to take action and respond accordingly, and the crisis forces businesses to adopt robust strategies and new operating models (Verma & Gustafsson, 2020). There is a tier of literature regarding how firms actively develop resilience to handle a crisis (Portuguez Castro & Gómez Zermeño, 2020) and how different crisis responses are suitable in different phases or stages of crises (Lettieri et al., 2009; Sigala, 2020). Kraus et al. (2020) studied the responses by family firms in Europe based on four types of strategic responses proposed by Wenzel et al. (2020): retrenchment, preserving, innovating and exit. This taxonomy illustrates how there are responses that are passive and conservative, while others are more proactive and opportunity-seeking. In their study of firms that survived the Greek financial downturn, Kottika et al. (2020) discussed the importance of proactive strategies, and small firms are often referred to as being particularly proactive in responding to challenges (Jones & Macpherson, 2006). The first proposition stated in the present paper is therefore based on the assumption that SMEs (pro)actively respond to the direct impact of a crisis:

P1: Responses to a specific crisis depend on the direct impact of a crisis on the firm.

### ***Firm characteristics***

Crisis response, in addition to crisis characteristics and the direct impact of a crisis, is also dependent on particular firm characteristics, such as sector, age and size (Cowling et al., 2015; Juergensen et al., 2020). Research has demonstrated how smaller firms were faster in responding to the global financial crisis (Cowling et al., 2015), as they can be more flexible and adaptive in modifying their strategies (Davidsson & Gordon, 2016; Doern, 2016). From that perspective, smaller SMEs would be more responsive to crises than larger SMEs. Another firm characteristic is maturity, and SMEs benefit from a learning culture within the organization when using digital innovations (Priyono et al., 2020). Hence, a stock of experiences and capabilities would facilitate responses to crises, and perhaps the more mature SMEs may have some strengths compared with more nascent SMEs. Thus, the second proposition is based on the assumption that SME characteristics influence crisis responses:

P2: Firm characteristics, such as age and size, influence a firm's responses to a crisis.

### ***Social network participation***

Although nascent and/or small firms may be flexible in adapting to a turbulent environment (Smallbone et al., 2012), such firms are simultaneously highly dependent on external sources of experiences and information (Eiriz et al., 2017). Hence, the absorptive capacity of SMEs, that is, the capacity to acquire, assimilate and exploit knowledge (cf. Cohen & Levinthal, 1990), is crucial to how firms gain essential knowledge. Essential knowledge to be absorbed by SMEs may be made available through managers' social

ties in social networks (cf. Granovetter, 1985), and social networking support has been found necessary for firms' ability to respond to crises (Giones et al., 2020). Social networks develop both through relationships with different institutions and through social connections (Portuguez Castro & Gómez Zermeño, 2020), and a distinction between formal and informal social networks may thus be made. Business incubators (cf. Aaboen, 2009; Mian et al., 2016) and institutionalized industry networks (cf. Walker et al., 1997) represent formalized ways to embed firms in an environment where, for instance, social networks are facilitated, and access to networks of various sorts is thus considered a central offering of initiatives aiming to support firm creation and growth (Amezcuca et al., 2013). In addition, more informal interactions represent important social networks (Eniola, 2020), such as social interactions with investors and participation in interest groups (Cross et al., 2002; Pina-Stranger & Lazega, 2011). Thus, interaction and support through networks may provide SMEs with essential resources, such as access to materials, manufacturing, or financing (cf. Bjørgum et al., 2021; Pina-Stranger & Lazega, 2011), and access to customers and specialized industry knowledge (cf. Vanhaverbeke, 2001). Smallbone et al. (2012) found that networks were important for firms' access to essential resources. SMEs' participation in formal and/or informal networks is thus expected to contribute to SME managers' 'know-how' in terms of how to respond to crises, as well as providing them with the necessary means to implement responses accordingly (Pal et al., 2014). This is because observation of other SMEs' crisis responses, including eventual collaborative approaches to crisis response, may not be adequately implemented in situations where the SMEs' resource base is insufficient. Therefore, the third proposition is based on the assumption that participation in formal and/or informal networks influences crisis responses:

P3: Participation in formal and/or informal networks influences a firm's responses to a crisis.

The distinction between using one's own's experiences as the basis for crisis responses and leveraging knowledge from observing others or eventually collaborating with others (cf. Lévesque et al., 2009) in developing responses provides the basis for the fourth proposition:

P4: A firm's responses to a crisis may be based on the SMEs' own experiences, observation of other firms and/or collaboration with other firms.

Propositions P1–P3 may be combined into the fifth proposition, which suggests that different combinations of the abovementioned factors may influence crisis responses differently. For example, micro-sized SMEs' participation in formal networks may explain different responses than larger SMEs' participation in the same networks.

P5: Different combinations of negative impacts of crises, firm characteristics and network participation influence responses to a crisis differently.

Proposition P5 may be expressed as a research model for an empirical study:

$$\text{response} = f(\text{crisis impact}, \text{firm age}, \text{firm size}, \text{formal networks}, \text{informal networks})$$

As proposition P4 suggests that there are different types – 'dimensions' – of responses, the outcome 'response' from the expression above may be expressed multi-dimensionally

because SMEs' responses encompass experience-based, observation-based and collaboration-based responses:

$$\text{response [exp, obs, coll]} = \begin{cases} \text{experience – based responses} \\ \text{observation – based responses} \\ \text{collaboration – based responses} \end{cases}$$

## Methodology

The methods applied in the present paper follow a critical realist philosophy (cf. Danermark et al., 2019) with the aim of identifying complex combinations of specific factors that can explain a particular outcome through assessment of a suggested research model through fsQCA (Gerrits & Verweij, 2013). Quantitative measurement of the factors and outcomes in the research model was found appropriate because it can provide empirical grounding from a representative sample of SMEs – yet within the specific context of the COVID-19 pandemic – to assess the developed research model (cf. Jones, 2010). The present paper builds on quantitative data collected through an online questionnaire in May 2020 in Norway, which was during a time when the impact of the COVID-19 crisis on most businesses in the country was at its maximum intensity in terms of restrictions on daily life imposed by national authorities. Because the research model suggests that SMEs' crisis response is a function of a complex combination of several factors, as indicated by propositions P1–P5, a qualitative comparative analysis was chosen for the analysis of the questionnaire data. This section elaborates on the sample, measures and analysis techniques that were used in the empirical investigation.

## Sample and measures

The sample was derived from a population of 1531 knowledge-based SMEs in Norway with a valid registered email address in the national registry of limited companies. The SMEs would be categorized as 'knowledge-based SMEs' guided by Narula (2002), and SMEs registered with NACE-codes<sup>2</sup> 62: 'computer programming, consultancy and related activities', 71: 'architectural and engineering activities, technical testing and analysis', 72: 'scientific research and development' and 74: 'other professional, scientific and technical activities' were selected. A narrow selection of sectors was chosen to avoid sectors where the business is grounded in access to specific natural resources (cf. Cowling et al., 2015) or where operations have been effectively restricted or even banned, such as how travel bans affected the tourism sector and how lockdowns affected the bar and restaurant sector (cf. Haneberg, 2021). The questionnaire was distributed to the SME managers through email invitation with two reminders during a one-week period. Complete responses for all the variables used in the present paper were received from 247 SMEs, corresponding to a response rate of 16.1%.

The measures used were as follows. The direct negative *impact of the crisis* on the firm was measured using five statement items rated through a seven-point Likert scale (1 = very negatively, 7 = very positively). These items were developed for the present paper and asked to what degree the crisis induced by the COVID-19 has affected (1) product



development, (2) marketing and sales to existing customers, (3) marketing and sales to new customers, (4) the firm's financial situation and (5) development of the organization. The five items were combined into a single measure, which has a Cronbach's alpha of 0.816 and is considered good (cf. Gliem & Gliem, 2003). Firm characteristics were measured in line with previous research (Cowling et al., 2015; Macpherson & Holt, 2007) as *firm age* and *firm size*, and the respondents were asked to provide an integer number for both. *Participation in formal and/or informal networks* was measured through six yes/no questions that inquired if the SME or the SME manager participated in three types of formal networks – business incubator or accelerator, formal industry cluster or local industry network – and three types of informal networks – interest organizations, relationships to investors/financiers and social interactions with managers of similar firms. The six questions departed from network types and network facilitation covered in the literature (e.g. Mian et al., 2016; Walker et al., 1997). Business incubators and accelerators were included in the questionnaire because there is a variation in firm age and firm size within the sample; hence, some of the SMEs could be characterized as early-stage firms. Two combined variables for formal and informal networks were generated, in which participation is represented by a 'yes' answer to at least one of the former three, and participation in informal networks is represented by a 'yes' to at least one of the latter three questions. The three outcomes, experience-based, observation-based and collaboration-based *crisis responses*, were measured with one statement item on a seven-point Likert scale (1 = strongly disagree, 7 = strongly agree). The statement items were created according to Mariotti (2012) and posed the following about the crisis induced by COVID-19: 'The firm is doing/planning responses based on prior experiences', 'The firm is doing/planning responses based on observations and/or experiences of other firms' and 'The firm is doing/planning responses in collaboration with other firms'. Table 1 presents descriptive statistics for the measures used in the present paper.

### Data analysis using fsQCA

Fuzzy-set qualitative comparative analysis was performed in STATA/MP version 16.1 using the fsQCA package 'fuzzy' by Longest and Vaisey (2008). fsQCA is well suited to study complex phenomena as it offers the opportunity to test complex influences from combinations of variables or factors rather than the effects of single variables

**Table 1.** Descriptive statistics. SD = standard deviation, FNT = full non-membership threshold, CP = crossover point, FMT = full membership threshold (Ragin, 2008).

Measure	Mean	SD	Min.	Max.	FNT	CP	FMT
Crisis impact*	4.94	0.97	1.8	7	4	5	6
Firm age (in years)	5.47	1.61	3	10	3.5	5	7
Firm size (number of employees)	4.23	6.89	1	47	2	5	10
Participation in formal networks (1 = yes)	0.18	0.39	0	1	0	-	1
Participation in informal networks (1 = yes)	0.62	0.49	0	1	0	-	1
Experience-based crisis responses	4.60	1.56	1	7	2	4	6
Observation-based crisis responses	4.25	1.48	1	7	2	4	6
Collaboration-based crisis responses	3.49	1.91	1	7	2	4	6

\*The survey measure addressed the scale from very positive to very negative, and because the present paper regards the negative impact of crises, the full non-membership threshold was set to be equal to the middle option on the Likert scale (4).



(Kraus et al., 2018). Hence, fsQCA combines the strengths of both qualitative and quantitative research methods, and the number of published research papers using fsQCA is rapidly increasing in business, management, innovation and entrepreneurship research (Kraus et al., 2018). The results from fsQCA present different paths to an outcome, which in the present paper means how different combinations of crisis impacts, firm characteristics and network participation together may explain the three types of crisis responses. The combinations of explanatory factors and outcomes are referred to as ‘sets’ (Greckhamer et al., 2018).

In fsQCA, the values of the variables assume to be between 0 and 1, where 1 represents that a case – in this paper a responding SME – has ‘full membership’ in a specific condition, such as a negative impact of a crisis. Conversely, the value 0 represents ‘full non-membership’ of a specific condition. Preparation of the dataset through calibration is essential for fsQCA and is a ‘half-conceptual, half-empirical process of identifying thresholds that meaningfully represent differences in kind and differences in degree among cases’ (Greckhamer et al., 2018, p. 488). While already dichotomous variables, such as the ones describing participation in networks in the present paper, are ready for fsQCA as is, the Likert-scale variables, as well as the firm characteristics (firm age and firm size), need to be calibrated to be assigned the appropriate value between 0 and 1. Calibration into fuzzy sets was performed using the direct approach described by Ragin (2008). The set values for full non-membership thresholds, crossover points and full membership thresholds were decided based on a thorough evaluation of the meaning and distribution of each of the variables and are provided in Table 1.

fsQCA was conducted separately for each of the three response types (experience-based, observation-based and collaboration-based) and their logically inverted counterparts. According to Ragin (2006), the  $\gamma$ -consistency of a set should be at least 0.8, so the threshold was set accordingly for the analyses. A significance threshold of  $p < 0.05$  was also set for all analyses. The resulting set from the fsQCA was a minimum configuration reduction set using the Quine–McCluskey algorithm (cf. Longest & Vaisey, 2008). The values for solution consistency and total coverage confirm a well-fit model (solution consistency  $> 0.92$ ), though with smaller total coverage of the total possible solution set; that is, the number of cases in the empirical data that correspond to the sets is low (21, 7 and 8 cases, respectively) compared with the total number of cases in the dataset (247 cases).

### **Research limitations**

There are always limitations in research, and the present study is no exception. The study was conducted at a point in time close to the onset of the COVID-19 pandemic, and firms’ responses to the crisis may likely have developed because the data was collected in May 2020. However, the findings of the present paper are supported by previous research related to how small firms respond to crises and add nuances on top of the previous research. Thus, the argument for the importance of firm characteristics and network participation will likely also be valid in 2021 and later. Because Norwegian firms within selected sectors were chosen, the results are most directly applicable to knowledge-based SMEs (cf. Narula, 2002) in Norway and other northern European economies with relatively strong support schemes to help SMEs survive. An inherent limitation in the present paper is the inclusion of factors in the initial research model:

impact of the crisis, network participation and firm characteristics. The factors were based on a review of previous research, and factors that can contribute to SMEs' responses may not have been part of this research. A related limitation is how the factors were measured. The questionnaire was kept focused and short to facilitate the response rate during a turbulent period for the surveyed SMEs, which comes at a potential cost of limiting response options regarding how the factors were measured.

## Results

The results from the fsQCA are presented in Table 2. A total of seven sets were found to explain SMEs' responses to crises.

In the following text, membership for a factor is denoted by capital letters, such as 'MI' when a firm is micro-sized. Similarly, non-membership is denoted by lowercase letters, such as 'mi' when a firm is *not* micro-sized. The solutions leading to experience-based responses may be simplified to the following function:

$$response [exp] = ma*mi*fn*in + IMP*MI*FN*(MA + IN)$$

Hence, one path (based on set 1) to experience-based crisis responses is a non-mature ('ma') and non-micro-sized firm ('mi') that does not participate in either formal or informal networks ('fn' and 'in'). The other path (based on sets 2 and 3) to experience-based crisis responses is a firm that is negatively affected by the crisis ('IMP'), participates in formal networks ('FN'), is micro-sized ('MI') and either is mature ('MA') or participates in informal networks ('IN'). The solutions leading to observation-based responses may be simplified to the following function:

$$response [obs] = FN*IN*(imp*MA*mi + IMP*ma*MI)$$

Hence, participation in both formal ('FN') and informal ('IN') networks is necessary for observation-based responses to occur. This is in combination with either a firm that is not negatively affected by the crisis ('imp'), is mature ('MA') and is not micro-sized ('mi') or a firm that is negatively affected by the crisis ('IMP') and is micro-sized ('MI') but not mature ('ma'). Lastly, the solutions leading to collaboration-based responses may be simplified to the following function:

$$response [coll] = imp*FN*IN*(ma*mi + MA*MI)$$

**Table 2.** Truth table from the fuzzy-set qualitative comparative analysis. Imp = negative impact of the crisis, Ma = mature firm, Mi = micro-sized firm, FN = participation in formal networks, IN = participation in informal networks, N = frequency, Exp. = experience-based response, Obs. = observation-based response, Coll. = collaboration-based response, RCov = raw coverage, UCov = unique coverage, SCon = solution consistency.

Set	Imp	Ma	Mi	FN	IN	N	Exp.	Obs.	Coll.	RCov	UCov	SCon
1	-	0	0	0	0	3	1			0.042	0.042	0.923
2	1	-	1	1	1	11	1			0.086	0.028	0.913
3	1	1	1	1	-	7	1			0.063	0.005	0.964
4	0	1	0	1	1	3		1		0.032	0.023	0.947
5	1	0	1	1	1	4		1		0.051	0.042	0.929
6	0	0	0	1	1	5			1	0.050	0.040	0.955
7	0	1	1	1	1	3			1	0.031	0.021	0.909

Participation in both formal ('FN') and informal ('IN') networks is necessary for collaboration-based responses, just as is the case with observation-based responses. In addition, not being negatively affected by the crisis is also necessary ('imp') when combined with a firm that is either not mature ('ma') or not micro-sized ('mi') or a firm that is both mature ('MA') and micro-sized ('MI'). Moreover, it is evident from Table 2 that there were no combinations that led to firms *not* responding based on experience, observation or collaboration.

## Discussion

The results suggest that, at an overarching level, SMEs' responses to crises are a function of negative impacts of the crisis, firm age, firm size, participation in formal networks and participation in informal networks. This is because the fsQCA did not fully eliminate any of the factors, which supports the overall model presented for the present paper. However, the fsQCA demonstrates that different combinations of the factors lead to different outcomes in terms of experience-based, observation-based or collaboration-based responses to crises. In this section, the influences of the five factors are discussed.

### *Impact of the crisis*

It is not surprising that the negative impact of a crisis is part of explaining how firms respond to the crisis, and the link between the impact of a crisis on a firm and a response due to the crisis impact is a basic premise for the present paper and in line with Haneberg (2021) and Verma and Gustafsson (2020). However, the results provide some interesting nuances beyond stating that crisis impact matters. While the first path to *experience-based* responses suggests that the more nascent firms (less than five years) that have already grown larger than micro-sized firms (more than five employees) but do not participate in networks are indifferent to the impact of the crisis, the impact of the crisis certainly does matter for firms that are micro-sized and participate in formal networks such as business incubators and accelerators. This is, however, only if the firm either is mature (more than five years) or participates in informal networks. Hence, the impact of crises explains experience-based responses for smaller firms that are network participants and more mature. The impact of the crisis is also a factor explaining *observation-based* responses for firms that are more nascent and smaller. The present paper thus adds support to research that suggests that nascent firms do not have a sufficient internal experience base and are instead more dependent on observing other firms when affected by a crisis (Smallbone et al., 2012). Moreover, firms that are older and larger must be *less* affected by the crisis for observation-based responses to be explained in the fsQCA. A reason may be that larger and more mature firms may have developed organizational routines and/or resources to deliberately monitor their surroundings (Lévesque et al., 2009; Macpherson & Holt, 2007). Interestingly, collaboration-based responses require that the firm is *less* affected by the crisis, which can be understood that firms that are too much affected are not making collaboration-based efforts, but rather experience- or observation-based. Thorgren and Williams (2020) found that managers were reluctant to make investments during the crisis. Collaboration-based responses may require such investments and make investing in new collaborative

efforts less attractive. In addition, firms that were already involved in collaborative activities prior to COVID-19 may have been less vulnerable to impacts of the crisis due to their resource and knowledge benefits from existing ties within their industry (Pal et al., 2014; Vanhaverbeke, 2001; Walker et al., 1997).

### ***Participation in formal and informal networks***

Participation in both formal and informal networks is found essential for all paths explaining observation-based and collaboration-based responses to crises, which supports the assumption that network participation enables observation of other firms and collaboration with other firms when responding to a crisis (Eiriz et al., 2017; Smallbone et al., 2012). Network participation explains experience-based responses of micro-sized and eventually more mature firms, except the more nascent firms that have already grown beyond the micro-sized category where *non-participation* in networks explains experience-based responses. Although the sample used in the present paper is narrow in terms of sectors, it is likely a broad range of technologies, business models and growth strategies among the studied SMEs. While some firms may quickly develop their offerings and bring them to market, other firms may, for instance, need significant time to develop their technologies. Business incubators and accelerators are protective environments that facilitate the firm's development through, for instance, networking (Amezcuca et al., 2013; Mian et al., 2016). SMEs may benefit from such support initiatives, as well as other types of network participation covered in the present paper, such as formal industry networks (Eiriz et al., 2017; Walker et al., 1997) and informal social interactions (Cross et al., 2002; Giones et al., 2020), when responding to a crisis. Moreover, smaller firm size for the more mature firms may not imply lower firm performance because growth through network collaboration can be a deliberate business strategy (Macpherson & Holt, 2007). Overall, the results provide empirical support for the benefits of network participation when responding to a major crisis (Giones et al., 2020; Pal et al., 2014; Smallbone et al., 2012).

### ***Influence of firm age and firm size***

The discussion above about the impact of the crisis and network participation has already hinted at how firm characteristics in terms of firm age and firm size affect SMEs' responses to crises. Firm age and firm size were found to explain all three types of responses to crises. In fact, the two firm characteristics are what differentiate the paths leading to either observation-based responses or collaboration-based responses. Firm characteristics differentiate the first path and the second path to experience-based responses, and it is only set 2 (in Table 2) that is indifferent to a firm characteristic, that is, firm size. In the expressions presented above, different combinations of the two firm characteristics – firm age and size – come into play for different types of responses. For experience-based and collaboration-based responses, it is the combinations 'MA\*MI' and 'ma\*mi' that are the criteria for deciding between two paths, while for observation-based responses, the decision is based on the combinations 'MA\*mi' and 'ma\*MI'. Therefore, the present paper shows that

such general firm characteristics are important to consider when firms' responses to crises are investigated, and it supports the argument against a one-size-fits-all approach to COVID-19, in line with Juergensen et al. (2020). Table 3 summarizes observations from the results in the present paper regarding how combinations of firm size and age lead to different types of responses to crises.

From Table 3, some interesting patterns can be found. First, firm age influences the responses of larger (that is, not micro-sized) SMEs because the more nascent firms pursue collaboration-based approaches whereas more mature firms pursue observation-based responses. Also, firm age influences responses for smaller (micro-sized) SMEs where only the more nascent firms pursue observation-based responses in addition to experience-based responses, suggesting that the more nascent small firms can be more agile in their responses (cf. Morgan et al., 2020). Hence, the present paper empirically supports that more nascent firms are more inclined to and/or more dependent upon interaction with and support from external actors in critical situations (cf. Jones & Macpherson, 2006; Rehman & Anwar, 2019). The present paper thus pinpoints the influence of firm age on SMEs' responses to major crises such as COVID-19. The overview in Table 3 also reveals how firm size influences the responses of more mature SMEs because micro-sized firms pursue collaboration-based responses whereas non-micro-sized firms pursue observation-based responses. Here, larger firms may have developed the resources required to monitor their

**Table 3.** Combinations of firm size and firm age among the SMEs leading to different types of responses to crises.

	<b>Firm size = micro-sized</b> ( <i>'MI'</i> , ≤ 5 employees)	<b>Firm size = non-micro-sized</b> ( <i>'mi'</i> , > 5 employees)
<b>Firm age = non-mature</b> ( <i>'ma'</i> , ≤ 5 years)	<p>'Nascent and small SMEs' <i>These firms are in the early stage and have not yet grown in terms of employees.</i></p> <p><b>Experience</b>-based responses to crises occur when combined with the negative impact of the crisis and participation in both formal and informal networks.</p> <p><b>Observation</b>-based responses to crises occur when combined with negative impact of crisis and participation in both formal and informal networks.</p>	<p>'Nascent and larger SMEs' <i>These firms could have grown fast internally compared to their age, at least in the number of employees.</i></p> <p><b>Experience</b>-based responses to crises occur when combined with non-participation in networks.</p> <p><b>Collaboration</b>-based responses to crises occur when combined with participation in both formal and informal networks and with the absence of the negative impact of the crisis.</p>
<b>Firm age = mature</b> ( <i>'MA'</i> , > 5 years)	<p>'Mature but still small SMEs' <i>Have had the time to develop knowledge but have grown less internally in the number of employees. Could have instead grown their external networks?</i></p> <p><b>Experience</b>-based responses to crises occur when combined with the negative impact of the crisis and participation in both formal and informal networks.</p> <p><b>Collaboration</b>-based responses to crises occur when combined with participation in both formal and informal networks and with the absence of negative impacts of the crisis.</p>	<p>'Mature and larger SMEs' <i>Have had the time to grow and have also grown internally in terms of employees.</i></p> <p><b>Observation</b>-based responses to crises occur when combined with participation in formal and informal networks and an absence of the negative impact of the crisis.</p>

surroundings and implement responses based on observations of others, while the smaller firms are more dependent on direct collaboration (Amezcuca et al., 2013; Kraus et al., 2020).

### ***Investigating combinations of antecedent factors***

While the results contribute by confirming that the impact of the crisis influences SMEs' responses and that network participation is essential for observation-based and collaboration-based responses, the most novel contributions are made through bringing forward empirical evidence of how firm age and firm size are important factors that influence SMEs' responses. Cowling et al. (2015) found that only larger SMEs were able to grow during the global financial crisis of 2007–2008. While the present paper does not assess firm growth, it adds nuance by showing how small and/or nascent SMEs may also respond to crisis impact through network participation. Moreover, the present paper finds that managers of nascent firms do not disengage during a crisis if they do participate in formal and informal networks, in line with Davidsson and Gordon (2016) and Pal et al. (2014). Thus, the present paper brings forward distinct features of small and/or nascent firms during a major crisis, reinforcing the argument that a one-size-fits-all approach to research on SMEs' crisis responses or to SME support policies may not be appropriate (Juergensen et al., 2020). Furthermore, the present paper stresses the importance of network participation for SMEs' responses to crises.

As the present paper employed fsQCA to investigate how the combination of several factors explains different outcomes in terms of responses to crises, it has revealed how there are several different paths towards crisis responses and that different factors influence each of the paths by their existence or non-existence. Hence, the present paper has been able to outline that the negative impact of the crisis is relevant to how SMEs respond to crises and that factors such as network participation and firm characteristics are also highly relevant to research on crisis responses. While several previous studies have found networks to be important for how small firms address challenges, the present paper adds nuance to previous studies (e.g. Giones et al., 2020; Smallbone et al., 2012) by pinpointing how firm age and size in *combination* with network participation explain SMEs' crisis responses.

### **Conclusion**

The present paper shows that SMEs' experience-based, observation-based and collaboration-based responses to crises are explained by antecedent factors, including the negative impact of the crisis, firm age, firm size, participation in formal networks and participation in informal networks. Leveraging the analytical opportunities offered by fsQCA, a novel contribution from the present paper is made by demonstrating how combinations of network participation, firm age and firm size explain different types of responses in conjunction with the negative impact of the COVID-19 crisis. The different identified combinations each represent paths towards specific responses to crises, and the present paper thereby provides insight into how an understanding of combined factors is important for research on how SMEs have responded to the COVID-19 crisis (Kraus et al., 2020). While previous research has investigated different types of

responses to crises (e.g. Kraus et al., 2020; Thorgren & Williams, 2020), the present paper contributes by furthering an understanding of where responses originate from (experience-based, observation-based or collaboration-based) and how different factors explain the three types of the response action. Moreover, the present paper contributes by adding nuance to and extending upon previous research that finds network participation (e.g. Davidsson & Gordon, 2016; Giones et al., 2020; Pal et al., 2014), firm age and firm size (e.g. Cowling et al., 2015; Juergensen et al., 2020) to be influential in research on small business management during crises. Through showing how combinations of factors explain response types, the present paper addresses the need for new perspectives on how and why small firms respond as they do (Morgan et al., 2020).

The present paper has implications for practice because it – in line with Juergensen et al. (2020) – demonstrates how support for SMEs in the crisis should not be a generic effort but rather should holistically consider the different factors that have been proven to facilitate different response strategies. There are, for example, different combinations of factors explaining the collaborative responses of small and mature firms than for larger and less mature firms. Hence, the insights presented here could be useful for those supporting small business establishment and growth, such as incubator managers, as well as policymakers at local or national levels, to aid SMEs in surviving the challenging situations they are currently faced with.

The present paper builds on empirical data collected during the initial intense period of the COVID-19 crisis, so one suggestion for future research is to conduct studies of SMEs' responses to the crisis later during the evolving crisis when firms have probably adapted their responses and learned through the crisis. Moreover, longitudinal studies of firms' responses should be done to determine if and how crisis response strategies change and develop over time. Using fsQCA in the present paper has facilitated novel findings that add nuance to previous research, and this motivates future research to use the analytical opportunities that fsQCA enables to perform studies that account for complex combinations of several factors when exploring explanations for specific outcomes. Based on the finding that network participation is important for SMEs' responses, further research should also explore in more detail how network types and activities influence SMEs' responses.

## Notes

1. The official information page about support schemes from the Norwegian government is, at the time of this writing, unfortunately not available in English.
2. NACE is short for 'Nomenclature des Activités Économiques dans la Communauté Européenne', which is a statistical classification for economic activities in Europe that is used in the public database of registered firms in Norway.

## Disclosure statement

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## References

- Aaboen, L. (2009). Explaining incubators using firm analogy. *Technovation*, 29(10), 657–670. <https://doi.org/10.1016/j.technovation.2009.04.007>
- Acs, Z. J., Szerb, L., & Autio, E. (2015). The global entrepreneurship and development index. In Z. J. Acs, L. Szerb, & E. Autio (Eds.), *Global entrepreneurship and development index 2014* (pp. 39–64). Springer.
- Akpan, I. J., Udoh, E. A. P., & Adebisi, B. (2020). Small business awareness and adoption of state-of-the-art technologies in emerging and developing markets, and lessons from the COVID-19 pandemic. *Journal of Small Business and Entrepreneurship*, Advance online publication, <https://doi.org/10.1080/08276331.2020.1820185>
- Amankwah-Amoah, J., Khan, Z., & Wood, G. (2020). COVID-19 and business failures: The paradoxes of experience, scale, and scope for theory and practice. *European Management Journal*, 39(2), <https://doi.org/10.1016/j.emj.2020.09.002>
- Amezcuca, A. S., Grimes, M. G., Bradley, S. W., & Wiklund, J. (2013). Organizational sponsorship and founding environments: A contingency view on the survival of business-incubated firms, 1994–2007. *Academy of Management Journal*, 56(6), 1628–1654. <https://doi.org/10.5465/amj.2011.0652>
- Bjørgum, Ø, Aaboen, L., & Fredriksson, A. (2021). Low power, high ambitions: New ventures developing their first supply chains. *Journal of Purchasing and Supply Management*, 27(1), 100670. <https://doi.org/10.1016/j.pursup.2020.100670>
- Brown, R., & Rocha, A. (2020). Entrepreneurial uncertainty during the covid-19 crisis: Mapping the temporal dynamics of entrepreneurial finance. *Journal of Business Venturing Insights*, 14), <https://doi.org/10.1016/j.jbvi.2020.e00174>
- Brown, R., Rocha, A., & Cowling, M. (2020). Financing entrepreneurship in times of crisis: Exploring the impact of COVID-19 on the market for entrepreneurial finance in the United Kingdom. *International Small Business Journal: Researching Entrepreneurship*, 38(5), <https://doi.org/10.1177/0266242620937464>
- Carracedo, P., Puertas Medina, R., & Luisa Martí Selva, M. (2020). Research lines on the impact of the COVID-19 pandemic on business. A text mining analysis. *Journal of Business Research*, 132), <https://doi.org/10.1016/j.jbusres.2020.11.043>
- Cohen, W. M., & Levinthal, D. A. (1990). Absorptive capacity: A new perspective on learning and innovation. *Administrative Science Quarterly*, 35(1), 128–152. <https://doi.org/10.2307/2393553>
- Cowling, M., Liu, W., Ledger, A., & Zhang, N. (2015). What really happens to small and medium-sized enterprises in a global economic recession? UK evidence on sales and job dynamics. *International Small Business Journal: Researching Entrepreneurship*, 33(5), 488–513. <https://doi.org/10.1177/0266242613512513>
- Cross, R., Nohria, N., & Parker, A. (2002). Six myths about informal networks — and how to overcome them. *MIT Sloan Management Review*, 43(2), 67–76.
- Danermark, B., Ekström, M., & Karlsson, J. C. (2019). *Explaining society: Critical realism in the social sciences*. Routledge.
- Davidsson, P., & Gordon, S. R. (2016). Much ado about nothing? The surprising persistence of nascent entrepreneurs through macroeconomic crisis. *Entrepreneurship: Theory and Practice*, 40(4), 915–941. <https://doi.org/10.1111/etap.12152>
- Doern, R. (2016). Entrepreneurship and crisis management: The experiences of small businesses during the London 2011 riots. *International Small Business Journal: Researching Entrepreneurship*, 34(3), 276–302. <https://doi.org/10.1177/0266242614553863>
- Doern, R., Williams, N., & Vorley, T. (2019). Special issue on entrepreneurship and crises: Business as usual? An introduction and review of the literature. *Entrepreneurship and Regional Development*, 31(5–6), 400–412. <https://doi.org/10.1080/08985626.2018.1541590>
- Donthu, N., & Gustafsson, A. (2020). Effects of COVID-19 on business and research. *Journal of Business Research*, 117, 284–289. <https://doi.org/10.1016/j.jbusres.2020.06.008>

- Eiriz, V., Gonçalves, M., & Areias, J. S. (2017). Inter-organizational learning within an institutional knowledge network: A case study in the textile and clothing industry. *European Journal of Innovation Management*, 20(2), 230–249. <https://doi.org/10.1108/EJIM-11-2015-0117>
- Eniola, A. A. (2020). Entrepreneurial self-efficacy and orientation for SME development. *Small Enterprise Research*, 27(2), <https://doi.org/10.1080/13215906.2020.1752295>
- Etemad, H. (2020). Managing uncertain consequences of a global crisis: SMEs encountering adversities, losses, and new opportunities. *Journal of International Entrepreneurship*, 18(2), 125–144. <https://doi.org/10.1007/s10843-020-00279-z>
- Gerrits, L., & Verweij, S. (2013). Critical realism as a meta-framework for understanding the relationships between complexity and qualitative comparative analysis. *Journal of Critical Realism*, 12(2), 166–182. <https://doi.org/10.1179/rea.12.2.p663527490513071>
- Giones, F., Brem, A., Pollack, J. M., Michaelis, T. L., Klyver, K., & Brinckmann, J. (2020). Revising entrepreneurial action in response to exogenous shocks: Considering the COVID-19 pandemic. *Journal of Business Venturing Insights*, 14), <https://doi.org/10.1016/j.jbvi.2020.e00186>
- Gliem, J. A., & Gliem, R. R. (2003). *Calculating, interpreting, and reporting Cronbach's alpha reliability coefficient for Likert-type scales*. In 2003 midwest research to practice conference in adult, continuing, and community education. Ohio State University.
- Granovetter, M. (1985). Economic action and social structure: The problem of embeddedness. *American Journal of Sociology*, 91(3), 481–510. <https://doi.org/10.1086/228311>
- Greckhamer, T., Furnari, S., Fiss, P. C., & Aguilera, R. V. (2018). Studying configurations with qualitative comparative analysis: Best practices in strategy and organization research. *Strategic Organization*, 16(4), 482–495. <https://doi.org/10.1177/1476127018786487>
- Haneberg, D. H. (2021). SME managers' learning from crisis and effectual behaviour. *Journal of Small Business and Enterprise Development*, Advance online publication, <https://doi.org/10.1108/JSBED-01-2021-0009>
- Herbane, B. (2010). Small business research: Time for a crisis-based view. *International Small Business Journal*, 28(1), 43–64. <https://doi.org/10.1177/0266242609350804>
- Jones, K. (2010). The practice of quantitative methods. In B. Somekh & C. Lewin (Eds.), *Theory and methods in social research* (pp. 201–211). Sage.
- Jones, O., & Macpherson, A. (2006). Inter-organizational learning and strategic renewal in SMEs. Extending the 4I framework. *Long Range Planning*, 39(2), 155–175. <https://doi.org/10.1016/j.lrp.2005.02.012>
- Juergensen, J., Guimón, J., & Narula, R. (2020). European SMEs amidst the COVID-19 crisis: Assessing impact and policy responses. *Journal of Industrial and Business Economics*, 47(3), 499–510. <https://doi.org/10.1007/s40812-020-00169-4>
- Kottika, E., Özsoyer, A., Rydén, P., Theodorakis, I. G., Kaminakis, K., Kottikas, K. G., & Stathakopoulos, V. (2020). We survived this! What managers could learn from SMEs who successfully navigated the Greek economic crisis. *Industrial Marketing Management*, 88, 352–365. <https://doi.org/10.1016/j.indmarman.2020.05.021>
- Kraus, S., Clauß, T., Breier, M., Gast, J., & Tiberius, V. (2020). The economics of COVID-19: Initial empirical evidence on how family firms in five European countries cope with the corona crisis. *International Journal of Entrepreneurial Behaviour & Research*, Advance online publication, <https://doi.org/10.1108/IJEER-04-2020-0214>
- Kraus, S., Ribeiro-Soriano, D., & Schüssler, M. (2018). Fuzzy-set qualitative comparative analysis (fsQCA) in entrepreneurship and innovation research – The rise of a method. *International Entrepreneurship and Management Journal*, 14(1), 15–33. <https://doi.org/10.1007/s11365-017-0461-8>
- Kuckertz, A., Brändle, L., Gaudig, A., Hinderer, S., Morales Reyes, C. A., Prochotta, A., Steinbrink, K. M., & Berger, E. S. C. (2020). Startups in times of crisis – A rapid response to the COVID-19 pandemic. *Journal of Business Venturing Insights*, 13), <https://doi.org/10.1016/j.jbvi.2020.e00169>
- Lettieri, E., Masella, C., & Radaelli, G. (2009). Disaster management: Findings from a systematic review. *Disaster Prevention and Management: An International Journal*, 18(2), 117–136. <https://doi.org/10.1108/09653560910953207>

- Lévesque, M., Minniti, M., & Shepherd, D. (2009). Entrepreneurs' decisions on timing of entry: Learning from participation and from the experiences of others. *Entrepreneurship: Theory and Practice*, 33(2), 547–570. <https://doi.org/10.1111/j.1540-6520.2009.00303.x>
- Longest, K. C., & Vaisey, S. (2008). Fuzzy: A program for performing qualitative comparative analyses (QCA) in stata. *Stata Journal*, 8(1), 79–104. [https://doi.org/10.1177/1536867\(0800800106](https://doi.org/10.1177/1536867(0800800106)
- Macpherson, A., & Holt, R. (2007). Knowledge, learning and small firm growth: A systematic review of the evidence. *Research Policy*, 36(2), 172–192. <https://doi.org/10.1016/j.respol.2006.10.001>
- Mariotti, F. (2012). Exploring interorganizational learning: A review of the literature and future directions. *Knowledge and Process Management*, 19(4), 215–221. <https://doi.org/10.1002/kpm>
- Mian, S., Lamine, W., & Fayolle, A. (2016). Technology business incubation: An overview of the state of knowledge. *Technovation*, 50–51, 1–12. <https://doi.org/10.1016/j.technovation.2016.02.005>
- Morgan, T., Anokhin, S., Ofstein, L., & Friske, W. (2020). SME response to major exogenous shocks: The bright and dark sides of business model pivoting. *International Small Business Journal: Researching Entrepreneurship*, 38(5), 369–379. <https://doi.org/10.1177/0266242620936590>
- Munn, Z., Peters, M. D., Stern, C., Tufanaru, C., McArthur, A., & Aromataris, E. (2018). Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Medical Research Methodology*, 18(1), 1–7. <https://doi.org/10.1186/s12874-018-0611-x>
- Narula, R. (2002). Innovation systems and “inertia” in R&D location: Norwegian firms and the role of systemic lock-in. *Research Policy*, 31(5), 795–816. [https://doi.org/10.1016/S0048-7333\(01\)00148-2](https://doi.org/10.1016/S0048-7333(01)00148-2)
- Ope, O. F., Bakken, T. H., & Bokolo, A. J. (2021). The role of hydropower in renewable energy sector toward CO<sub>2</sub> emission reduction during the COVID-19 pandemic. *International Journal of Green Energy*, Advance online publication, <https://doi.org/10.1080/15435075.2021.1930005>
- Pal, R., Torstensson, H., & Mattila, H. (2014). Antecedents of organizational resilience in economic crises—An empirical study of Swedish textile and clothing SMEs. *International Journal of Production Economics*, 147(Pt. B), 410–428. <https://doi.org/10.1016/j.ijpe.2013.02.031>
- Pantano, E., Pizzi, G., Scarpi, D., & Dennis, C. (2020). Competing during a pandemic? Retailers' ups and downs during the COVID-19 outbreak. *Journal of Business Research*, 116, 209–213. <https://doi.org/10.1016/j.jbusres.2020.05.036>
- Pina-Stranger, A., & Lazega, E. (2011). Bringing personalized ties back in: Their added value for biotech entrepreneurs and venture capitalists interorganizational networks. *Sociological Quarterly*, 52(2), 268–292. <https://doi.org/10.1111/j.1533-8525.2011.01204.x>
- Portuguez Castro, M., & Gómez Zermeño, M. G. (2020). Being an entrepreneur post-COVID-19 – resilience in times of crisis: A systematic literature review. *Journal of Entrepreneurship in Emerging Economies*, Advance online publication, <https://doi.org/10.1108/JEEE-07-2020-0246>
- Priyono, A., Moin, A., & Putri, V. N. A. O. (2020). Identifying digital transformation paths in the business model of SMEs during the COVID-19 pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, 6(4), 104. <https://doi.org/10.3390/joitmc6040104>
- Ragin, C. C. (2006). Set relations in social research: Evaluating their consistency and coverage. *Political Analysis*, 14(3), 291–310. <https://doi.org/10.1093/pan/mpj019>
- Ragin, C. C. (2008). Measurement versus calibration: A set-theoretic approach. In J. Box-Steffensmeier, H. Brady, & D. Collier (Eds.), *The Oxford handbook of political methodology*. Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780199286546.003.0008>
- Ratten, V. (2020). Coronavirus (covid-19) and entrepreneurship: Changing life and work landscape. *Journal of Small Business and Entrepreneurship*, Advance online publication, <https://doi.org/10.1080/08276331.2020.1790167>
- Regjeringen. (2021). *Informasjon for norske bedrifter om koronautbruddet [Information for Norwegian companies about the corona outbreak]*. Regjeringen.no. <https://www.regjeringen>.

[no/no/tema/naringsliv/sporsmal-og-svar-for-norske-bedrifter-om-koronautbruddet/id2694423/](https://doi.org/10.1080/13215906.2019.1624385)

- Rehman, A. U., & Anwar, M. (2019). Mediating role of enterprise risk management practices between business strategy and SME performance. *Small Enterprise Research*, 26(2), 207–227. <https://doi.org/10.1080/13215906.2019.1624385>
- Salamzadeh, A., & Dana, L. P. (2020). The coronavirus (COVID-19) pandemic: Challenges among Iranian startups. *Journal of Small Business and Entrepreneurship*, Advance online publication, <https://doi.org/10.1080/08276331.2020.1821158>
- Sigala, M. (2020). Tourism and COVID-19: Impacts and implications for advancing and resetting industry and research. *Journal of Business Research*, 117, 312–321. <https://doi.org/10.1016/j.jbusres.2020.06.015>
- Smallbone, D., Deakins, D., Battisti, M., & Kitching, J. (2012). Small business responses to a major economic downturn: Empirical perspectives from New Zealand and the United Kingdom. *International Small Business Journal*, 30(7), 754–777. <https://doi.org/10.1177/0266242612448077>
- Sørheim, R., Aadland, T., Alsos, G. A., Aspelund, A., Eide, A. E., Haneberg, D. H., Lauvås, T. A., Rasmussen, E., & Solheim, M. C. W. (2020). *Innovasjon i krisetider – innovasjon og omstilling under covid-19. Notat på oppdrag for Innovasjon Norge [Innovation in times of crisis – Innovation and restructuring under covid-19. Memorandum on assignment for Innovation Norway]*. Innovasjon Norge. <https://www.innovasjonnorge.no/globalassets/0-innovasjonnorge.no/om-innovasjon-norge/kort-om-oss/innovasjonstalen/rustet-til-restart—innovasjonstalen-2020—rapport.pdf>
- Thorgren, S., & Williams, T. A. (2020). Staying alive during an unfolding crisis: How SMEs ward off impending disaster. *Journal of Business Venturing Insights*, 14), <https://doi.org/10.1016/j.jbvi.2020.e00187>
- Vanhaverbeke, W. (2001). Realizing new regional core competencies: Establishing a customer-oriented SME network. *Entrepreneurship and Regional Development*, 13(2), 97–116. <https://doi.org/10.1080/08985620110035642>
- Verma, S., & Gustafsson, A. (2020). Investigating the emerging COVID-19 research trends in the field of business and management: A bibliometric analysis approach. *Journal of Business Research*, 118, 253–261. <https://doi.org/10.1016/j.jbusres.2020.06.057>
- Walker, G., Kogut, B., & Shan, W. (1997). Social capital, structural holes and the formation of an industry network. *Organization Science*, 8(2), 109–125. <https://doi.org/10.1016/b978-0-7506-7222-1.50013-1>
- Wenzel, M., Stanske, S., & Lieberman, M. B. (2020). Strategic responses to crisis. *Strategic Management Journal*, 41(7/18), <https://doi.org/10.1002/smj.3161>