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Strategizing Green Marketing in Times of Uncertainty: Does it Pay Off?

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Strategizing green marketing in times of uncertainty: Does it pay off?

Abstract

Purpose – This research investigates the impact of green marketing strategy (GMS) and firms' decision to invest in or divest from green marketing activities during a crisis on business performance.

Design/methodology/approach – The study collected survey data from 245 Greek firms during the 2015 Eurozone crisis to investigate the impact of GMS and green marketing investments on firm resilience during crisis. Time-lagged, objective performance data for a subset of these firms helped examine the impact of GMS on post-crisis financial performance.

Findings – Pursuing a GMS builds resilience, especially for companies that decided *not* to reduce resources allocated to green marketing activities during a recession. Beyond resilience, firms investing in GMS during the crisis experienced improved financial performance in the long run. Finally, this research proposes a typology of GMS responses during a crisis.

Research limitations/implications – This study does not specify which types of green marketing activities lead to more investment or divestment during a crisis.

Practical implications – The study offers insights for allocating resources to green marketing during recessions. Supporting GMSs during unpredictable times is important to successfully navigate performance both during and after a crisis. Six crisis response profiles are offered: (green- non-believers, dis-investors, reluctants and cautious-, opportunistic-, strategic- green investors).

Social implications – The study proposes a balanced approach to environmental sustainability, marketing strategy, and firm performance during a crisis.

Originality/value – The study argues that GMSs enables firms to survive a crisis and recover from financial shocks.

Keywords – Green marketing strategy, Uncertainty, Sustainability, Resilience, Financial performance

Paper type – Research paper

Introduction

The climate crisis, the COVID-19 pandemic, and the ongoing inflation crisis due to the recent conflicts in Ukraine and Middle East have created of a prolonged period of uncertainty. In this "new normal", firms are increasingly facing the challenge of identifying optimal strategies that enable them to enhance cost-efficiency and adapt to environmental disruptions while remaining resilient and creating value through environmentally sustainable business practices (McKinsey & Company, 2022). In this ever-evolving crisis context, firms are striving to find the right balance between meeting their commitments to corporate sustainability and safeguarding their financial performance in the long run (Ioannou and Serafeim, 2019). The present study aims to examine the impact of green marketing strategy (GMS) and firms' decision to invest in or divest from green marketing activities during a long period of uncertanty.

As economic crises exert pressures on company budgets, firms put increased scrutiny on sustainability and marketing investments (e.g., Bhattacharya *et al.*, 2020; Lamey *et al.*, 2007). When economies, markets, and industries become stagnant, profit margins get trimmed, and the cost of capital sharply rises, managers are often torn between focusing on their firms' economic survival and prioritizing environmental sustainability challenges. In this context, managers must make hard decisions among strategic alternatives, such as continuing to invest resources in sustainability and marketing, reallocating sustainability resources to alternative activities considered more efficient, or cutting sustainability and marketing budgets altogether for the purpose of cost rationalization. Although empirical research has established the performance benefits of implementing GMSs (e.g., Leonidou *et al.*, 2013), whether investing in such strategies under recessionary economic phases leads to positive and enduring business performance outcomes remains unclear. The lack of related research leaves several questions unanswered: (1) What makes some firms more willing to

pursue GMSs during recessions? (2) Does pursuing a GMS help a firm overcome an economic crisis? (3) Does increasing financial investments in green strategy during crisis conditions pay off or should green marketing investments be contained during crisis to achieve cost rationalization? Finally, (4) does investing in GMSs during recessionary times leave the firm better off in terms of performance in the long run and after the recession has subsided?

Drawing on the natural resource-based view (NRBV; Hart, 1995) and contingency theory (Lawrence and Lorsch, 1969), we develop a conceptual model (see Figure 1) that links GMS and green marketing investments during a recession with short-term (during crisis) and long-term (after crisis) performance outcomes. We also examine the factors that build a firm's commitment to GMSs during recessionary periods. We empirically test our model using survey-based data collected from managers of Greek firms during the 2015 Eurozone crisis and objective performance metrics obtained for a subset of these firms four years after the peak of the crisis. The findings highlight (1) the role of corporate sustainability and stakeholder pressures as intrinsic and extrinsic drivers of a firm's commitment to GMS, (2) the positive effects of GMS on the firm's ability to overcome a crisis, and (3) the positive, long-term effects of increasing investments in green marketing during recessions.

Our findings contribute to the environmental/green marketing and management literature and practice in several ways. First, we explain how the exogenous environment of uncertainty influences the development of a GMS as a dynamic capability (Katsikeas *et al.*, 2016). Second, taking resilience as a firm's adaptive capability to respond to and recover from disruptions while sustaining successful operations and financial health (Erol *et al.*, 2010), we show that actively supporting a GMS during a crisis helps firms become more resilient through periods of uncertainty. Third, using subjective and objective performance data drawn in both pre- and post-crisis settings, we empirically test how and when increasing

green marketing investments during a crisis leads to long-term performance gains. Finally, we offer a typology of green strategic responses in times of crises to guide managerial decisions on strategic planning, development, and investments.

Conceptual background and research hypotheses

Green Marketing Strategy

Marketing scholars have argued that firms need capabilities that allow them to sense and exploit external opportunities (Menon and Menon, 1997). Previous studies have approached environmental strategies as capabilities that help firms achieve a strong market position and enhanced performance (e.g., Polonsky, 2011; Yim *et al.*, 2019). Such strategies enable firms to anticipate market changes and demand for sustainable products and equip them with the necessary skills and knowledge to respond effectively. Accordingly, we view GMS as a market-based capability that reflects initiatives and actions in the development, delivery, and communication of products with a minimized environmental impact (Dangelico *et al.*, 2013). By GMS, we refer to the holistic environmental approach of a firm's key strategic marketing activities, such as new product development, market research, segmentation, targeting, positioning, and marketing mix (Banerjee *et al.*, 2003). For example, undertaking market research to uncover environmental trends, using recycled or reusable materials for products, and investing in R&D to create environmentally friendly products/services are initiatives that reflect a GMS (Fraj-Andrés *et al.*, 2009; Papadas *et al.*, 2017).

Business management scholars have long argued for a positive association between proactive environmental strategies and firm performance (e.g., Menguc *et al.*, 2010; Oh *et al.,* 2019), including studies examining this relationship in business contexts with specific characteristics, such as markets undergoing periods of increased uncertainty (Ruenda-Manzanares *et al.*, 2008). While prior research has shown the direct influence of perceived uncertainty or similar variables (e.g., industry growth, market dynamism) as moderators of

decisions related to environmental strategies (Katsikeas *et al.*, 2016), little is known about how such strategies perform under conditions of heightened uncertainty triggered by recessions in both the short (i.e., during a crisis) and long (i.e., after a crisis) run. Table 1 provides an overview of empirical studies in this field, reflecting the need to (1) study the GMS–firm performance relationship during periods of uncertainty, (2) investigate how investment/divestment moderates this relationship, and (3) measure uncertainty as a natural context (i.e., a country experiencing a long period of uncertainty) instead of a simple variable.

Table 1 here

NRBV Theory: Green Marketing as a Capability

The NRBV posits that a firm's environmental commitment can develop unique environmental capabilities. These capabilities result not only in competitive advantage but also in pro-environmental responses (Hart and Dowell, 2010). NRBV theory puts emphasis on the development of three strategic capabilities to build an environmentally driven strategy: (1) pollution prevention, (2) product stewardship, and (3) sustainable development (Hart, 1995). Green marketing holistically captures these three capabilities as it aims to reduce emissions and waste (e.g., green logistics, green R&D), introduce eco-friendly processes (e.g., green marketing mix), and cultivate stakeholder engagement considering the natural environment (e.g., environmental business networks) (Papadas *et al.*, 2019).

However, environmental capabilities require time and resources to contribute to a sustainable performance over time (Hart, 1995). Therefore, commitment and resources are considered two important pre-requisites for developing a GMS over time. A GMS satisfies these conditions because it involves input from various organizational units, sufficient managerial initiatives, and resources as well as specific technical expertise to introduce and manage new technologies and processes (Leonidou *et al.*, 2013).

Importantly, NRBV further examines the relationship between environmental and business performance by connecting resources, capabilities, and strategic outcomes (Hart and Dowell, 2010). NRBV emphasizes the contingent nature of resources and capabilities and the need to commit resources to the dynamic development of environmental capabilities to combine successful environmental outcomes with superior business performance.

Contingency theory: green marketing during crises

According to contingency theory, organizations achieve effectiveness by aligning their characteristics with conditions that reflect their external environments (Lawrence and Lorsch, 1969). Adopting a contingency theory lens on NRBV, we argue that the implementation of green marketing practices is context dependent. Previous studies have stressed the importance of developing adaptive marketing capabilities that help anticipate trends and make faster adjustments to key market changes (e.g., Day, 2011). However, the literature remains silent on how external contingency factors (e.g., economic uncertainty) influence the relationship between green marketing practices and organizational performance (Maletič *et al.*, 2018). A deep economic recession forces organizations to make strategic decisions on (1) how committed they will be to their GMSs and (2) whether they will continue allocating resources to enable or reinforce these strategies. We propose that investing in a proactive environmental strategy such as GMSs during periods of uncertainty helps firms build a dynamic capability that is rare, non-imitable, and valuable (Aragón-Correa and Sharma, 2003). Figure 1 below shows the hypothesized model of our study.

Figure 1 here

Creating organizational commitment to GMS during crises

Legitimacy and stakeholder theories consider organizations open systems located in a broader social system (Saleem *et al.*, 2021). Both these theoretical streams are useful to understand extrinsic and intrinsic commitments as drivers of GMS that establish the firm's social

legitimacy (Sarkis *et al.*, 2010). We propose that corporate sustainability reflects a firm's intrinsic commitment to GMS while stakeholders' sustainability pressures represent its extrinsic commitment to GMS. Both types of this commitment jointly (yet independently) contribute to a firm's adoption of environmental strategies.

Corporate sustainability refers to policies and actions oriented toward realizing sustainable development of the natural environment, society, and economy (Ioannou and Serafeim, 2019). Previous research has shown that internal pressures such as internal regulatory forces (e.g., corporate social responsibility [CSR]) shape GMS through the commitment of an organization to corporate sustainability policies (Banerjee *et al.*, 2003). In the context of uncertainty, evidence shows that companies choose to maintain their sustainability programs because they need to maintain legitimacy in the eyes of stakeholders and meet the expectations of the society in which they are operating (Ruenda-Manzanares *et al.*, 2008). As a consequence, companies shape pro-environmental strategies across all corporate functions, including marketing. Firms that view themselves as sustainable corporate citizens incorporate sustainability elements in their marketing strategies (Banerjee *et al.*, 2003); follow market-oriented approaches to sustainability (Gabler *et al.*, 2021); engage in socially responsible purchasing and distribution policies; and implement green promotional practices, green pricing tactics, and eco-friendly product development (Özturan and Grinstein, 2022).

External stakeholders' pressures (e.g., media, customers) also motivate the adoption of a GMS (Menon and Menon, 1997). Business environments characterized by greater uncertainty urge managers to be more proactive and establish collaboration relationships with a wider range of external stakeholders that will help them anticipate future trends (Buysse and Verbeke, 2003). These initiatives reduce uncertainty by foreseeing future events and implementing preventive actions instead of reacting to events that have already occurred

(Aragón-Correa and Sharma, 2003). In their effort to deploy stakeholder integration capabilities, firms operating in highly uncertain environments improve their social legitimacy, predict future market changes, and craft more environmentally oriented strategies (Ruenda-Manzanares *et al.*, 2008). Thus, we hypothesize the following:

H1. Corporate sustainability is positively associated with GMS during a crisis.

H2. Stakeholders' sustainability pressures are positively associated with GMS during a crisis.

Building resilience and post-crisis performance through GMS

In strategic management literature, resilience reflects the ability to survive, recover, and bounce back when facing external threatening events, such as a global economic crisis (Ambulkar *et al.*, 2015; Iborra *et al.,* 2020). Prior studies view resilience as the ability to recover from disruptive events while sustaining operational efficiency and financial performance (Erol *et al.*, 2010; McCann *et al.*, 2009). Companies that possess operational resilience (OR) experience reduced impact from disruptions by sustaining a normal flow of production/service and exploiting opportunities for efficiency (e.g., cost innovations) (Craighead *et al.*, 2007). Birkie (2016) argues that OR mainly results from strategic capabilities that maintain or even improve operations while adapting to new conditions. Financial resilience (FR) refers to a company's ability to maintain above-average returns after absorbing the shocks of a market crash (Teixeira and Werther, 2013).

Overall, the literature has identified performance and time as two key parameters that reflect resilience (Sabatino, 2016). A common way to measure resilience in the face of a crisis is by capturing changes in performance outcomes (DesJardine *et al.*, 2019), such as profitability (Ortiz-de-Mandojana and Bansal, 2016) and operational costs (Ge *et al.*, 2023). Therefore, measuring the change in a firm's operational and financial performance over a specific period (i.e., before and during crisis) can capture a firm's resilience (Iborra *et al.*, 2020; Li *et al*., 2022).

Product development and customer-driven strategies are two drivers of a resilient company (Sabatino, 2016). Offering new products that address customer needs during a crisis helps companies become more resilient (Gebauer *et al.*, 2011), and thus GMS can serve as a source of innovation and cost reduction (Hart, 1995; Papadas *et al.*, 2019). By driving a transformation in operating systems in terms of productivity optimization, product innovation, and cost-efficiency, GMS helps firms build OR during a period of crisis (Lowitt, 2014). GMS also incorporates new product launches, product quality, and process flexibility and adapts its operating systems to new conditions, to boost OR in turbulent times (Birkie, 2016).

Prior research also suggests that environmental strategy has a positive impact on FR (e.g., Baker and Sinkula, 2005; Menon and Menon, 1997). In particular, a large number of studies have found a positive effect of proactive environmental strategies on market share change, sales growth, and profits (e.g., Klassen and McLaughin, 1996; Menguc *et al.*, 2010). Recent studies have also confirmed that strategic environmental practices contribute to organizational resilience during a recession (Ortiz-de-Mandojana and Bansal, 2016; DesJardine *et al.*, 2019). Thus, we hypothesize the following:

H3. GMS has a positive effect on OR during a crisis.

H4. GMS has a positive effect on FR during a crisis.

In contrast with resilience, which mostly captures corporate survival and recovery speed, long-term performance reflects a firm's competitiveness and value generation (Lloret, 2016). Amid the restrictions that economic, social, and environmental crises impose, companies can achieve successful long-term performance by developing strategies that decrease volatility of financial returns and generate future value (Cavaco and Machado, 2015). Firms that are able to adjust to environmental disturbances experience high financial stability, growth, and survival rates (Ortiz-de-Mandojana and Bansal, 2016).

Companies with a focus on sustainability demonstrate successful long-term financial performance (Lloret, 2016). Thus, emphasis on the effect of environmental strategies on long-term performance is important because sustainability implies continuity. For example, Aragón-Correa and Sharma (2003) found a positive link between proactive environmental strategies and financial performance measured with long-term indicators such as return on investment. This is in line with Choi *et al.* (2020), who found that firms with high carbon emissions have lower stock returns when experiencing extreme weather conditions, which in turn prompts more attention to the climate crisis. Furthermore, previous findings suggest that a firm that works consistently toward better financial performance also achieves positive financial results over time (Clarkson *et al.*, 2008; King and Lenox, 2001; Orlitzky *et al.*, 2003). Thus, we hypothesize the following:

H5. GMS has a positive effect on financial performance after a crisis.

Financing and enabling GMS during a crisis

Crises put managers in a cost-cutting mode. For example, economic downturns negatively affect investments in new product development because R&D does not offer immediate returns and thus represents an easy target for cost-saving (Barrett, 1991). Yet managers have the option to treat a crisis as an opportunity by investing in marketing during hard times (O'Malley *et al.*, 2011). Related research shows that managers who invest in marketing amid a market crash judge their companies as better surviving the crisis (Rollins *et al.*, 2014). Gulati *et al.* (2010) found that companies are likely to become post-recession winners if they maintain marketing investments. Similarly, other studies report that increases in marketing investment in a crisis contribute to firm performance (Srinivasan *et al.*, 2005). Consequently, it could be argued that companies that continue to commit resources in GMSs during crisis conditions will receive positive returns in the post-crisis era.

The availability of financial resources is crucial in enabling companies to deliver an environmental strategy, as most firms view environmental efforts as discretionary (Sharma, 2000). Management research posits that optional managerial choices are linked with the availability of slack resources (Leonidou *et al.*, 2013). Slack is the surplus between a firm's financial resources and its operational costs (George, 2005), and therefore the availability of slack resources pushes investment toward environmental activities (Waddock and Graves, 1997). As environmental strategies usually incur significant expenditures, firms with such resources are eager to make environmental investments (Campbell, 2007).

However, slack resources become challenging to manage during a deep recession because uncertainty dominates markets. Financial crises affect the broader economy, resulting in a shift in the competitive landscape. Whether and how firms adjust their investments in strategic capabilities depends on their ability to balance their long-term performance objectives with adaptation to short-term business disturbances (Srinivasan *et al.*, 2005). In contingency theory, the role of slack resources is vital in unpredictable environments because firms can experiment with new initiatives and effectively adapt to exogenous changes (Nohria and Gulati, 1996). During a recession, slack resources push companies to focus on strategic investments (e.g., green marketing) over cost control, leading to enhanced, long-term performance (Li *et al.*, 2022). Finally, evidence from the Great Recession of 2008 suggests that companies that maintained their investments in sustainability-related programs became more efficient and resilient during economic downturns (Flammer and Ioannou, 2021). Therefore, investing resources in green marketing activities during a crisis should contribute to firms' ability to maintain or even strengthen their resilience and post-crisis performance (Eccles *et al.*, 2014). Thus:

H6a. The higher the availability of resources for green marketing during a crisis, the greater the effect of GMS on OR.

H6b. The higher the availability of resources for green marketing during a crisis, the greater the effect of GMS on FR.

H6c. The higher the availability of resources for green marketing during a crisis, the greater the effect of GMS on the long-term, post-crisis financial performance.

Research method

Context

We chose Greece as the country context to test our conceptual model. The case of Greece in 2015 provides fertile ground for examining GMS in a time of uncertainty for several reasons. First, Greece experienced the deepest recession in its modern history during the 2010–2014 period, with an average gross domestic product decline of 4.2% and an average unemployment rate of 21.1% (Wolf, 2015). Second, an increasing number of green marketing policies emerged in the 2010s as the country had one of the worst records on carbon dioxide emissions (Nantsou *et al.*, 2015). Third, the commitment of the Greek government to implement specific OECD (2017) environmental recommendations as part of the macroeconomic adjustment programs led firms to experience high regulatory pressures. Fourth, many domestic and multinational firms based in Greece were increasingly adopting environmental marketing practices (SEV Business Council for Sustainable Development, 2016).

Questionnaire development

We undertook a thorough review of the literature to draft a questionnaire, which we then refined with personal interviews with seven C-level marketing executives and five senior marketing academics who had extensive experience in the sustainability and green marketing field. The interviews with the marketing executives offered valuable insights into the relevance of the study constructs to understand the underlying mechanism of the GMS–firm performance relationship in a recessionary period. The interviews with the marketing

academics also helped us adapt established measures identified in prior research to the specific characteristics of our research setting. Subsequently, the five academic researchers evaluated the content and face validity of the measures selected (Netemeyer *et al.*, 2003). Furthermore, we pretested the questionnaire in a large-scale pilot study to 85 postgraduate management students (see Appendix A1 for respondents' characteristics). Finally, we undertook a large quantitative study (presented next) to test our hypotheses. We later supplemented the quantitative subjective data with objective data drawn from a Gallup's subsidiary in Greece for further analyses.

Sampling

We used a list of 1622 firms from the database of a Gallup subsidiary in Greece as the sampling frame. We focused on five industry groupings for generalizability purposes (i.e., fast-moving consumer goods [FMCG], industrial products, services, wholesalers–retailers, and remaking–construction–other). A representative proportion from each sector (business-to-business and business-to-consumer) was desirable; we also included large firms with a turnover higher than €10m in the study population to guarantee the existence of some form of environmental policy. Doing so is also in line with research on strategy that focuses on large firms, given that smaller firms are less likely to invest money in green strategies (Siedschlag and Yan, 2021). We selected a stratified sample of 600 companies. All companies were first approached through telephone contact to gauge their intention to participate in the study, confirm that they are still in operation, and identify key informants. We scrutinized all respondents through telephone and email contact to confirm that they are knowledgeable. We conducted an online survey for data collection, through which we distributed questionnaires to CEOs or marketing or sustainability/CSR managers from the selected firms (see Appendix A2 for sample characteristics). We then sent a formal cover letter to the personal e-mail of each respondent, providing a brief introduction and a general explanation of the study. To

incentivize respondents, we offered to send a short presentation of the final results. Of the 600 questionnaires sent, 281 questionnaires were returned, but we dropped 36 because of incomplete data. The remaining 245 usable questionnaires represented a 40.8% response rate.

At a later stage, for further analyses purposes, we obtained access to the ICAP-CRIF company database in Greece, which contains objective financial performance data for a significant proportion of companies operating in Greece. Through this process, we managed to collect objective performance data, such as return on equity (ROE) and earnings before interest, taxes, depreciation, and amortization (EBITDA), for 110 companies in our sample related to fiscal year 2019. In this way, we obtained objective data for a large proportion of our sample related to their performance four years after the survey data collection year. We used these secondary data to investigate long-term effects and address single-informant biases.

Measures

Respondents completed seven-point Likert scales (1 = strongly disagree, 7 = strongly agree) for all constructs. We selected measures that best corresponded to our constructs' conceptual domain. To measure *Corporate Sustainability*, we used Turker's (2009) seven-item scale, which measures the degree of a firm's commitment to the natural environment, the society, and future generations. Turker's (2009) scale fits well with our study because it focuses on firm commitment, while other scales focus on processes and practices. We operationalized *Stakeholders' Sustainability Pressures* using the six-item scale from Sarkis *et al.* (2010) because it captures pressures on sustainability-related issues by a company's key stakeholders, such as customers, shareholders, and employees. To measure *GMS*, we used a 15-item scale adapted from Fraj-Andrés *et al.* (2009) and Papadas *et al.* (2017) to capture the holistic approach to green marketing. The GMS scale reflects both strategic and tactical activities, such as developing new eco-friendly programs and obtaining environmental

certifications. The *OR* and *FR* measures reflect a firm's survival during a crisis in terms of operational and financial outcomes. To measure *OR*, we used the five-item scale from Fraj-Andrés *et al.* (2009), which captures products' cost, quality, and innovation capacity relative to the firm's stated objectives. We measured *FR* with five items from Morgan *et al.* (2004) that capture the firm's profitability relative to its stated objectives. As resilience reflects the ability to respond to and overcome an unanticipated shock (DesJardine *et al.*, 2019) and given that it can be expressed through the parameters of performance and time (Cavaco and Machado, 2015), we measured both OR and FR using respondents' assessment of their current operational and financial performance *compared with the last three years of recession* (2011–2014) on a seven-point scale (1 = much worse, 7 = much better). Li *et al.* (2022) and Ortiz-de-Mandojana and Bansal (2016) used the same approach. We measured the availability of *Green Marketing Resources* (GMRs) during the recession with a single-item scale adapted from the perceptual, subjective measure of Chattopadhyay *et al.* (2001), as done in similar studies (e.g., Srinivasan *et al.*, 2005). The respondents rated the availability of GMRs during the last three years of the recession (2011–2014) *compared with the pre-crisis availability* on a seven-point scale (1 = very much reduced, 7 = very much increased). Table 2 provides the full list of the scales and their items along with their psychometric properties.

Table 2 here

Non-response and common method bias

We tested for non-response bias following the Armstrong and Overton's (1977) proposed method. In our sampling frame, we were able to find comparable data in terms of the company sector and the number of employees between respondents and non-respondents. Our t-test analysis based on the number of employees showed non-significant differences between the two groups ($p = 0.092$). With regard to company sector, we first needed to merge our sample's sector sub-categories into three main groups (FMCG, industrial products, and

services) to have comparable data, given that our sampling frame included these major sector categories. The proportions' tests yielded non-significant results (FMCG: $z = –.236$, $p = .810$; industrial products: $z = –1.253$, $p = .212$; services: $z = 1.327$, $p = .183$). The t-test analyses also found no significant differences between early and late respondents (based on the median return rate) on key study measures (see Appendix A3 for details).

We used the marker variable approach (Lindell and Whitney, 2001) to address the issue of common method variance. Our marker variable measured respondents' beliefs about the technology status in the industry (i.e., "Technological developments in our industry are rather minor") on the same seven-point scale format as the main variables in the model. Specifically, after establishing that this variable is conceptually unrelated to the main constructs (all correlations between this variable and the six main model constructs range between .003 and .098 and are non-significant), we calculated both raw inter-construct correlations and corrected correlations after partialing out the influence of the marker variable. Comparison of these two sets of correlations reveals no changes in statistical significance, while the correlation sizes are practically identical, with few minor differences at the third decimal digit. These results suggest the absence of common method variance (see Appendix A4).

Social desirability bias

As people may perceive green marketing practices as desirable behavior, social desirability bias may potentially influence respondents' responses (Steenkamp *et al.*, 2010). To measure such a bias, we used Strahan and Gerbasi's (1972) Form X1, which is a short version of the Marlowe–Crowne social desirability scale. To investigate potential confounding effects, we correlated the scale with the GMS, OR, and FR scales. All correlations were either non-significant or relatively low for both overall scores, as were their individual items (see Appendix A5). These results indicate that socially desirable responses are unlikely to play a

role in respondents' assessments.

Results

Measurement model assessment

We conducted confirmatory factor analysis to test the psychometric properties of all latent construct measures. The measurement model fits the data well (χ^2 = 1931.344, *df* = 924, $p <$ 0.001; RMSEA = 0.067; CFI = 0.892; SRMR = 0.059). Construct validity and reliability were also established as indicated by (1) high Cronbach's alpha coefficients (ranging from 0.862 to 0.94), (2) satisfactory item-to-construct loadings (ranging from 0.588 to 0.955), and (3) composite reliabilities (ranging from 0.868 to 0.943) and average variance extracted (AVE) values (ranging from 0.527 to 0.750) exceeding conventional threshold levels. We assessed discriminant validity for each pair of estimated constructs by constraining the estimated correlation parameter between them at 1.0 and then performing a chi-square difference test on the values obtained for the constrained and unconstrained models (Anderson and Gerbing, 1988). Discriminant validity was achieved, given the significantly lower chi-square values for all models in which the trait correlation was not constrained to unity (see Appendix A6). In addition, discriminant validity for all constructs was demonstrated by AVE values exceeding corresponding squared correlations for all construct pairs (Fornell and Larcker, 1981). Table 2 provides an overview of the measurement model results, while Table 3 below shows the scales' relevant means, standard deviations, and inter-construct correlations.

Table 3 here

Hypotheses testing

We estimated a structural model reflecting the conceptual framework of Figure 1 with AMOS. We developed the interaction term needed to test the moderating hypothesis (H6) using residual centering (Lance, 1988). We (1) constructed the product of the composites of

GMS with GMR (GMS × GMR), (2) orthogonalized this product term by retaining the residuals estimated after regressing it on the original variables used to construct it, and (3) used these residuals as a single-item indicator of the interaction latent variable in the structural model after fixing its error variances at levels determined by the original variables' reliabilities (Ping, 1995).

The estimated structural model fits the data well ($\chi^2 = 935.557$, $df = 417$, $p < 0.001$; RMSEA = 0.072; CFI = 0.893; SRMR = 0.069). Individual path estimates lend support to our hypotheses. More specifically, corporate sustainability has a strong positive effect on GMS ($\beta = 0.714$, $t = 9.718$, $p < 0.001$). Stakeholders' sustainability pressures has a positive impact on GMS ($\beta = 0.233$, $t = 3.098$, $p < 0.01$). Regarding the main construct of our study, GMS has a significant, positive effect on both OR ($\beta = 0.445$, $t = 2.554$, $p < 0.01$) and FR ($\beta = 0.469$, $t = 2.713$, $p < 0.01$). The results also show support for the moderating hypotheses by generating significant estimates in the expected direction for the GMS × GMR interaction term on OR and FR. More specifically, GMR intensifies the positive effect of GMS on both OR ($\beta_{GMS \times GMR \rightarrow OR} = 0.137$, $p < 0.05$) and FR ($\beta_{GMS \times GMR \rightarrow FR} = 0.159$, $p < 0.05$). Importantly, we obtain these estimates after including three types of statistical controls on the performance outcomes (OR and FR) to rule out alternative explanations and minimize sources of variance in the dependent variables attributable to firm characteristics. Specifically, we included (1) a measure of company age (years since founding), (2) a measure of company size (number of employees), and (3) firm sector dummies to account for industry differences. Table 4 presents an overview of the model estimation results.

Table 4 here

Although the structural model estimation provides support for all our hypotheses, we also conducted conditional process analysis using bootstrap estimation (PROCESS Models 1 and 4, 5000 resamples; Hayes, 2013) to obtain bias-corrected confidence intervals for the

hypothesized effects and probe the hypothesized interaction at different levels of the moderator. After obtaining support for our moderation hypothesis (i.e., the interaction effect is significant and in the hypothesized direction) using this alternative estimation approach, we probed the interaction using "floodlight" analysis (Spiller *et al.*, 2013). The Johnson–Neyman point ($t = 1.97$, $p < 0.05$) for the GMR moderator occurs at a value of 4.31 (on the seven-point scale) for the interaction effect on FR and at a value of 2.27 for the interaction effect on OR. This indicates that higher GMS levels result in significantly higher FR and OR outcomes than lower GMS levels for all values of GMR above 4.31 and 2.27, respectively, but not for values less than these points. In support of this, the different lines in Panel A of Figure 2 depict the association between GMR and FR/OR at different levels of GMS. As the graph shows, the slopes are positive and become steeper for higher levels of GMS as the level of GMR increases, indicating the significant moderating effect of GMR in the GMS–FR and GMS–OR relationships. Panel B shows that the 95% bootstrapping CIs for the effect include only positive values above the Johnson–Neyman point.

Figure 2 here

Green typology of companies

We conducted additional analyses to develop a classification of companies on their green strategy and relevant reactions during a crisis. This approach is also in line with prior research on the different responses to environmental strategies (Murillo-Luna *et al.*, 2008). First, we divided companies into three groups based on the availability of GMRs during the recession: those that divested resources from relevant activities during the crisis (with a relevant score below 4 on the seven-point scale; N = 107), those that exhibited a stable level of GMRs (with a relevant score equal to 4; N = 87), and those that showed an increased level GMRs during the recession (with a relevant score above 4; N = 51). Second, we divided companies into two groups based on their GMS scores: companies poorly engaged in a GMS

(scores lower than or equal to 4 on the seven-point scale: N = 116) and companies highly engaged in such a strategy (scores above 4; N = 129). With each company's score on the GMS and GMR scales, we created a 2 × 3 matrix. This process produced six groups of companies based on the level of GMS adoption and the availability of GMRs during the recession compared with the pre-crisis period. As Figure 3 shows, we labeled the six groups "strategic green investors" (i.e., companies that are highly engaged in a GMS and have high availability of resources for green investment even during the recession), "cautious green investors" (i.e., companies that are highly engaged in a GMS and had a stable availability of resources for such activity), "green disinvestors" (i.e., companies that are highly engaged in a GMS but divested resources to relevant investment activities during the crisis), "opportunistic green investors" (i.e., companies that are not highly engaged in GMS but viewed the recession as an opportunity to dedicate resources for such activity), "green reluctants" (i.e., companies that are poorly engaged in a GMS but tried to keep a stable availability of resources for such activity), and "green non-believers" (i.e., companies that are neither engaged in GMS nor dedicated resources to such activity).

Figure 3 here

To empirically test the conceptual typology, we also conducted a k-means cluster analysis to generate an empirical "green" membership based on the same variables (GMS and GMR). We examined cluster solutions with two to six groups. We chose the six-group cluster analysis solution for three reasons (Calantone and Sawyer, 1978; Punj and Steward, 1983). First, it showed the smallest average distance of cases from these groups' classification cluster center (M = 0.8). Second, the solution emerged after a minimum number of iterations (i.e., six vs. seven or more iterations in other solutions). Third, the means of the variables used in the analysis were statistically different between clusters ($p < 0.001$). An additional test found that the six-group cluster solution was the only meaningful solution with a "good"

cluster quality based on the silhouette measure (above 0.5). Table 5 presents the profile of each cluster regarding the "green" variables used in the analysis. As the table shows, the empirical membership obtained through cluster analysis is similar to the results of our conceptual classification. As a final test of the relationship between our conceptual and empirical typologies, we conducted a cross-tabulation analysis. The results confirm that the two classifications highly overlap given the significance of the chi-square coefficient (Pearson $\chi^2 = 589.006$, $p < 0.001$; Cramer's V = 0.693, $p < 0.001$) and the magnitude of the diagonal frequencies (see Appendix A7 for details).

Table 5 here

We also performed one-way analyses of variance with FR and OR as the dependent variables and our "green" classification membership as the group variable. The results reveal a significant effect of "green" strategy types on both resilience measures, suggesting that performance outcomes vary significantly across company groups. Table 6 presents the relevant results for both the conceptual and empirical typologies. Comparisons of mean FR and OR scores across types show that resilience is significantly higher for "strategic green investors" than ''green non-believers'' and "green disinvestors"." In addition, in most comparisons, "opportunistic green investors" and ''cautious green investors'' seem to perform worse than "strategic green investors" but better than "green reluctants" and "green non-believers." In summary, the groups that seem to consistently differentiate on the key measures are only those with high GMS/GMR ("strategic green investors") and low GMS/GMR ("green non-believers"). The remaining four groups appear rather similar in most key variables, which further corroborates our expectation that a GMS should be paired with significant green investments to pay off in the long run.

Finally, we tested the company profile (e.g., size, industry) of the four groups using both conceptual and empirical memberships. In almost all analyses, we found no significant

differences between the characteristics of each group, suggesting that "green" behavior is not only for large companies or companies operating in a particular sector (see Appendix A8). We found significant differences only between domestic and multinational companies, given that "green disinvestors" and "green non-believers" seem to be mostly domestic companies.

Table 6 here

Long-term effects of GMS on objective performance across the "green" strategy types

The previous analyses identified positive effects of GMS on OR and FR *during* a crisis and validated a typology that explains variance in resilience, as subjectively perceived by the survey informants. However, these findings cannot offer conclusions about the impact of GMS on *objective*, *post-crisis*, *long-term* performance (i.e., whether pursuing or further investing in GMS during times of crises helps companies perform objectively better after the crisis has passed). To address this issue, we collected objective performance data from a subset of companies in our dataset (110 of 245).[1] Specifically, we collected data on two metrics that are important performance indicators in strategy research (Katsikeas *et al.*, 2016): ROE and EBIDTA. For each company, we recorded these metrics (1) four years after the survey data collection (i.e., 2019) – to be used as dependent variables – and (2) three years before the survey (i.e., 2012) – to be used as controls for pre-crisis performance. Importantly, this analysis not only allows us to test the long-term effects of GMS but also resolves issues related to endogeneity, common method bias, subjective measurement of performance, and single-informant bias associated with cross-sectional survey research.

To this end, we estimated our original model by substituting subjective resilience measures with (standardized) ROE and EBIDTA values in financial year 2019 as the dependent variable and adding the respective 2012 figures as an additional control (the

[1] No data were available from ICAP-CRIF Greece for the remaining 135 companies. Comparisons of the 110 companies for which objective performance data were available with the 135 companies for which data were not available on several company descriptors did not reveal significant differences in company turnover, company origin (domestic vs. multinational), or industry type (business-to-business vs. business-to-consumer).

remaining model specification was the same as in the previous analysis). To test our typology, we estimated the model using multi-group moderation analysis with green strategy types as the grouping variable.[2] Similar to the previous analysis, we formed three groups using the seven-point GMR scale: "investors," or those that increased investments in GMS during the crisis (scale response: 5–7); "stables," or those that kept their green marketing investments stable during the crisis (scale response: 4); and "disinvestors," or those that decreased green marketing investments during the crisis (scale response: 1–3). Specifically, we estimated an unconstrained model (in which all model paths were freely estimated for all three groups) and a constrained model (in which only the path from GMS to the respective performance metric was set equal for all three groups) and conducted formal chi-square comparisons between the models. If the model fit difference between the two models is statistically significant, we can conclude that the effect of GMS on long-term objective performance varies significantly across different company types.

The ROE multi-group estimation results show that the unconstrained model fits the data marginally better than the constrained model ($\chi^2_{unconstrained} = 32.13$, $df = 27$; $\chi^2_{constrained} = 37.51$, $df = 29$; $\Delta(\chi^2) = 5.38$, $\Delta(df) = 2$, $p = .068$). For the GMS → ROE path estimates across groups, we find that while for "stables" and "disinvestors" the effect of GMS on post-crisis ROE is not significant ($\beta_{stables} = -.082$, $p = .490$; $\beta_{disinvestors} = -.077$, $p = .662$), for "investors," the effect is positive and significant ($\beta_{investors} = .354$, $p = .015$). The same picture emerges when using EBIDTA as the dependent variable. The unconstrained model fit is marginally better than the constrained model one ($\chi^2_{unconstrained} = 27.54$, $df = 27$; $\chi^2_{constrained} = 32.28$, $df = 29$; $\Delta(\chi^2) = 4.74$, $\Delta(df) = 2$, $p = .093$). Similar to the ROE model, the GMS → EBIDTA path is not significant for "stables" or "disinvestors" ($\beta_{stables} = -.030$, $p = .505$; $\beta_{disinvestors} = -.028$, p

[2] For comparison purposes, we conducted two measurement invariance tests, one between high and low GMS firms and one between high and low GMR firms. We present the results in Appendix A9.

= .634) but is positive and significant for "investors" ($\beta_{investors}$ = .085, p = .018). These results collectively imply that GMSs during a crisis have a positive impact on post-crisis performance but only for companies that increased investments in green marketing activities.

Discussion

Managers facing resource shortages during a recession tend to cut their marketing and sustainability budgets for cost-saving purposes (Ioannou and Serafeim, 2019; Lamey *et al.*, 2007). Recent studies that have investigated the relationship among CSR, marketing spending, and firm performance during a financial shock (Bhattacharya *et al.*, 2020; Rollins *et al.*, 2014). Our study extends the current knowledge in this field by assessing the effect of the interplay between GMS and the firm's decision to invest in or divest from GMR on resilience and post-crisis performance during a period of uncertainty. Collectively, the contribution of our study is four-fold: our findings reveal that a) GMS is a dynamic capability which helps firms build resilience during periods of crises; b) GMSs have two pre-requisites to yield positive crisis outcomes: commitment and resources; c) firms develop GMSs when they are intrinsically committed to be sustainable corporate citizens and extrinsically motivated to satisfy stakeholder sustainability pressures, and d) the positive effects of GMSs during times of crises are materialized only if the strategy is consistently financed with increased resources during crises periods.

Theoretical Implications

First, this study contributes to the field of environmental/green marketing by responding to recent calls for research on responsible marketing and resilience in an era of continuous uncertainty (e.g., de Ruyter *et al.*, 2022). Drawing on NRBV theory (Hart, 1995) and contingency theory (Lawrence and Lorsch, 1969), our study adopts a novel perspective to explain the GMS–firm performance relationship during and after a crisis. Approaching green

marketing as a dynamic capability (Dangelico and Vocalelli, 2017), our study suggests that organizations should financially support GMS during difficult economic times when dilemmas about whether they should invest in or divest from environmental resurface. Our findings contribute in this area by showing that ongoing commitment to green marketing through the allocation of resources to GMS during a crisis does pay off in terms of both firms' ability to survive the crisis and their ability to remain profitable after the crisis.

Second, although previous studies have examined the GMS–firm performance relationship under the prism of perceived uncertainty (e.g., Katsikeas *et al.*, 2016; Ruenda-Manzanares *et al.*, 2008), we deepen this knowledge by conducting a study in a natural context of uncertainty (i.e., economic recession) and focusing on both short- and long-term performance outcomes. Our study also corroborates previous research with regard to the importance of commitment to sustainable management practices (e.g., Gabler *et al.*, 2021; Sarkis *et al.*, 2010) by extending findings in the green marketing field. In particular, our findings show that both intrinsic (i.e., corporate sustainability) and extrinsic (i.e., stakeholders' sustainability pressures) commitment are vital to GMS during and after a crisis, as organizations need to improve their social legitimacy in the eyes of stakeholders. In the context of an economic recession, these findings indicate that firms that have developed a strong commitment to GMS before a crisis are better poised to go through future crises relatively unscathed and emerge as post-crisis winners.

Third, previous research has examined the impact of green marketing on financial performance (Menon and Menon, 1997) , competitive advantage (Papadas *et al.*, 2019), product-market performance (Baker and Sinkula, 2005), and operational performance (Fraj-Andrés *et al.*, 2009). However, our study is the first to investigate the effect of GMS on business performance during an economic crisis. Our study reveals a positive link between GMS and firms' OR and FR during a recession. This finding also extends previous studies on

corporate responsibility or the sustainability–performance link during a recession (Bhattacharya *et al.*, 2020; Chemmanur *et al.*, 2021) by taking a step further and focusing on green marketing. As sustainability is the cornerstone for firms' resilience and success in the market (Nenkov, 2024), our work opens up a novel research stream to treat resilience as a performance outcome of green marketing practices (i.e., green marketing mix, new eco-product development) in an uncertain business environment.

Fourth, our findings suggest that increasing GMRs in times of uncertainty intensifies a firm's resilience. This finding builds on previous research on the availability of slack resources for green marketing (e.g., Leonidou *et al.*, 2013). In addition, though, our study further specifies the type and context of such slack resources (i.e., GMRs during a recession). Importantly, our study also takes a step further by obtaining objective data to provide fact-based evidence for the relationship between GMS and long-term, post-crisis performance. Our findings imply that investing in GMS in an uncertain business environment does pay off in the long run, but only for companies that increased investments for green marketing activities during the crisis. This finding corroborates and extends previous studies in the wider management field in terms of the impact of sustainability strategies and CSR investments on business performance after a recession (e.g., Ioannou and Serafeim, 2019). Strategy studies also suggest that investing in strategic environmental practices contributes to organizational resilience and helps companies survive longer (DesJardine *et al.*, 2019; Flammer and Ioannou, 2021). Therefore, our work makes a novel contribution to the strategy literature by suggesting that investing in a responsible, customer-focused strategy (i.e., GMS) during a recession can help companies achieve resilience and positive long-term performance. Relatedly, our study corroborates previous studies on the importance of maintaining marketing investments during a crisis to become post-recession winners (Gulati

et al., 2010; Srinivasan *et al.*, 2005) by extending these findings in the green marketing context.

Finally, our work reveals that firms fall under different strategic response types in terms of their decisions to pursue a GMS and invest in green marketing initiatives under turbulent economic conditions. In doing so, our research offers an empirically validated typology of green strategy responses during crises. Some firms regard economic downturns as opportunities to invest in or reinforce their existing GMS (i.e., strategic, cautious, and opportunistic green investors); others decide to divest from green marketing activities by approaching green investments as unproductive expenses (i.e., green disinvestors), and still others remain detached from green marketing activities altogether (i.e., green reluctants and non-believers). Our typology not only captures alternative strategic responses of firms under crisis conditions but also accounts for much of the variance in firms' resilience under economic crisis conditions.

Managerial implications

This study offers significant guidance to managers on how to navigate their business performance during and after a crisis. One of the major challenges of recessions is that they trigger budget reductions and force difficult decisions on resource redeployment among alternative strategic options. Sustainability and marketing budgets are often the first to be cut in times of uncertainty, as they are commonly perceived as contributing less to the firm's survival in the short run (Srinivasan *et al.*, 2005). However, such divestment decisions are often a double-edged sword as they end up hurting the firm's ability to thrive in the long run. Our findings show that pursuing and financially supporting a GMS balances purpose with profit, as it improves resilience during a recession and contributes to long-term performance in a responsible manner. Thus, putting strategic emphasis on environmental sustainability during recessionary periods makes sense to enhance resilience, reduce costs, and create value

(McKinsey & Company, 2022). This suggestion seems to resonate with real-world practice. For example, Unilever continued to invest in green marketing during economic challenges by promoting its sustainable brands such as Dove and emphasizing environmental friendliness in its communications (Stewart, 2022).

Furthermore, our study documents that firms that increased their investments in green marketing activities had higher financial performance in the post-crisis years. By contrast, those that only sustained or decreased their investments in GMS did not perform better after the crisis. Relatedly, during recessions, when access to capital is limited, firms are particularly worried about their ability to remain credible in the eyes of investors and capital lenders. Although our analysis did not focus on debtor trustworthiness as a dimension of crisis performance, an additional analysis of our sample firms suggests that firms that actively pursued and invested in GMSs during the recession were those that scored higher on credit rating indices (e.g., ICAP score).[3] This finding plausibly explains the ability of strategically green companies to overcome the capital-sourcing hurdles posed by economic recessions. Our findings also imply that managers should treat green marketing as a holistic strategy, fully integrated into the corporate marketing strategy, moving beyond short-term green marketing actions (i.e., green advertising) that often lead to unintended demand-side backlash, such as increased greenwashing perceptions (Papadas *et al.*, 2019). Rather, managers should focus on the long-term benefits of a GMS to build resilience, which aids in surviving a crisis and bouncing back afterward. For example, Nestlé's sustainable practices include responsible sourcing and reduction of its environmental impact across all product categories. Such initiatives have contributed to the company's ability to navigate uncertainty and build long-term resilience (Nestlé, 2022).

[3] Analysis of variance on the ICAP credit rating scores of our sample firms indicates that "strategic" and "cautious" green investors were awarded with significantly higher credit scores after the crisis ($M_{strategic}$ = 6.21; $M_{cautious}$ = 6.59) than "green disinvestors" (M = 5.00) or "green non-believers" (M = 4.60; F = 2.787, p = .021). Additional results are available on request.

In addition, our findings show that the ongoing commitment to sustainable practices before a crisis is a pre-requisite for the implementation of a successful GMS during and after the crisis. Integrating environmental responsibility into the marketing strategy is a long game that requires both intrinsic and extrinsic commitment. In line with previous studies on corporate sustainability (e.g., Gabler *et al.*, 2021), our study emphasizes the importance of having a corporate environmental orientation, which transcends the entire organization, including the marketing department (Hildebrand *et al.*, 2011; Papadas and Avlonitis, 2014). Implementing a holistic GMS during a crisis requires a minimum level of green marketing readiness (e.g., R&D for eco-friendly products, eco-friendly promotion) that should be in place before the crisis. This finding should give confidence to managers to maintain a long-standing GMS in both good and bad times.

Finally, our results are useful for corporate decision-makers engaged in competitor analysis and scenario planning. Understanding whether their firms will follow an expansive green crisis strategy (i.e., strategic/cautious/opportunistic green investors) or distance themselves from green marketing activities in times of crises (i.e., green disinvestors, reluctants, and non-believers) is important to diagnose their resilience potential and consider changes in green marketing investments after mapping where their competitors stand on this typology. For example, we speculate that for firms facing many green reluctants or non-believers in their immediate competitive sphere, investment in GMSs during crises will be even more promising as a base of competitive advantage and differentiation. The fashion industry is an interesting example in this regard because fashion brands actively compete in terms of environmental practices (e.g., using eco-friendly materials, promoting fair labor practices). This typology would help managers in market-sensing and shaping a GMS during a crisis accordingly. For example, Patagonia is known for its strong commitment to sustainability (a strategic green investor). Even in times of deep uncertainty such as the Great

Recession of 2008 and the recent COVID-19 pandemic, Patagonia ontinued investing in its fair-trade program and fostering its environmental partnerships (Byars, 2020). As such, it entered the post-crisis era with an edge over competing fashion brands in its category (Kearney Consumer Institute, 2023).

Limitations and future research

Our findings are subject to some limitations, which offer opportunities for future research. First, our research focuses on large firms. While we made this decision to ensure that the potential of GMSs is present in the sample firms, this sampling decision limits the generalizability of our findings for smaller companies. Future studies could focus on small and medium-sized firms to test whether they exhibit different crisis resilience (e.g., survival rates) depending on their green marketing orientation (Iborra *et al.*, 2020; Kottika *et al.*, 2020).

Second, it would be useful to undertake a longitudinal study to compare the implementation of green marketing activities before, during, and after a crisis. Doing so would uncover the importance of having a history of green commitment before the emergence of a market shock (Luengo-Valderrey *et al.*, 2022).

Third, we did not specify which types of green marketing investments were made before the crisis and to what extent those investments could or needed to be maintained during or after the crisis. For example, investing in environmental partnerships with green suppliers or distributors before a crisis might represent an example of green commitment that cannot be easily reversed even for a firm that decides to disinvest from green marketing activities because of recessionary pressures (Wu *et al.*, 2017). In addition, given the lack of specification regarding the types of green marketing investments, our findings do not reflect the impact of specific green activities but the influence of a GMS as a whole (Fraj *et al.*, 2009; Papadas *et al.*, 2017). As such, future research could examine this issue in more depth,

as different green marketing activities might have different returns on resilience and post-crisis performance. Future works could also clearly specify which types of green marketing initiatives are more or less likely to help firms in times of crises, delineating their potential for building resilience and performance after a crisis (as done for example by Katsikeas *et al.*, 2016). Relatedly, future research could examine which types of green marketing activities firms are most likely to invest in or divest from during a crisis (e.g., eco-product development, development of environmentally responsible brands, green pricing policies).

Fourth, regarding construct operationalizations, our study measured financial performance using accounting metrics (i.e., ROE and EBITDA). Future studies might also consider including more comprehensive measures of environmental performance (e.g., environmental, social, and governance ratings). Moreover, we measured resource investment in GMSs with a single-item measure. Although the "double-concrete" nature of the GMR construct (as conceptualized in this study) enables the use of a single-item scale (Rossiter, 2002), future research could consider more fine-grained measures of firms strategic decisions to invest in or divest from green marketing activities during a crisis (Flammer and Ioannou, 2021).

Finally, our research assessed a financial crisis and focused on the country market most heavily affected by it. Although the macroeconomic symptoms of different crises are often similar, the precise nature of every crisis is usually unique (e.g., the Great Recession in 2008, Eurozone crisis, COVID-19 pandemic, current energy crisis). Differences in the institutional environment, the national economy, and the culture of countries undergoing a crisis may also influence managerial responses (Choi *et al.*, 2016; Rathert, 2016). Therefore, future research should replicate our findings in the context of different crises and country markets to test their generalizability.

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Table 1. Previous research on environmental strategies in the context of uncertainty

Study	Context	''Uncertainty'' as a context	Focal variable	Outcomes	Key findings
Ruenda-Manzanares *et al.* (2008)	Cross-sectional, single observation: 134 ski resorts	***Moderator*** Perceived uncertainty	Stakeholder integration	Proactive environmental management	Perceived uncertainty positively moderates the relationship.
Leonidou *et al.* (2013)	Cross-sectional, single observation: 152 hotels	***Moderator*** Market dynamism	Environmental marketing strategy	Competitive advantage	Market dynamism has no effect on the relationship.
Chan *et al.* (2016)	Cross-sectional, single observation: 250 firms	***Moderator*** Environmental dynamism	Green product innovation	Firm profitability	Environmental dynamism positively moderates the relationship.
Katsikeas *et al.* (2016)	Cross-sectional, single observation: 183 manufacturing firms	***Moderator*** Market dynamism	Eco-friendly product development	Product development effectiveness	Market dynamism has no effect on the relationship.
Wu (2017)	Cross-sectional, single observation: 211 IT manufacturing firms	***Moderator*** Types of perceived uncertainty (demand, technology)	Green supply chain integration	Green product innovation	Demand uncertainty positively moderates the relationship.
Leonidou *et al.* (2017)	Cross-sectional, single observation: 153 Small manufacturing firms	***Moderator*** *Market dynamism*	Green business strategy	Competitive advantage	Market dynamism positively moderates the relationship.
Zhao *et al.* (2018)	Cross-sectional, single observation: 198 manufacturing firms	***Moderator*** Types of perceived uncertainties (demand, technology, supply)	External involvement	Green product innovation	Technological uncertainty positively moderates the relationship.
This study	Semi-longitudinal study: 245 firms across 5 industries and using time-lagged (t + 4), objective data from a subset of the initial sample (110 firms)	***Natural context*** A country market undergoing a long period of uncertainty	GMS	Operational and financial resilience and long-term financial performance	GMS positively affects operational resilience, financial resilience, and long-term financial performance. GMRs intensify these relationships.

Figure 1. Hypothesized model

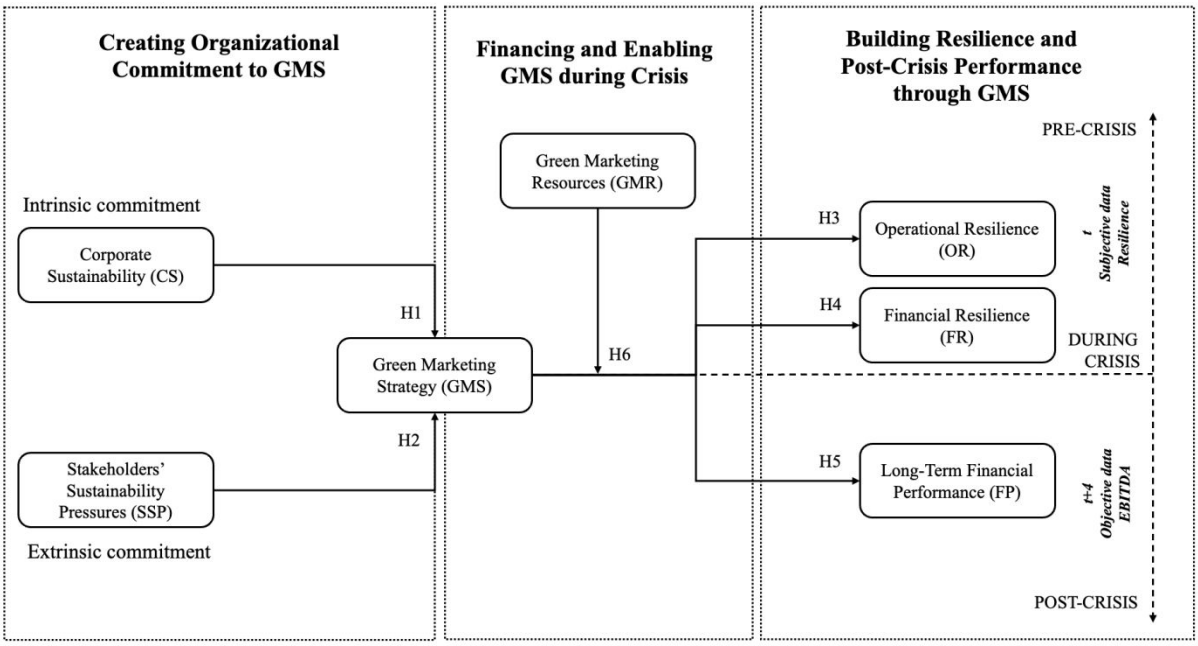

Table 2. Measurement model

Construct	Standard. loadings (λ)	M	SD
Corporate sustainability (Turker, 2009) *a = .926, CR = .922, AVE = .629*			
Our company participates in activities which aim to protect and improve the quality of the natural environment.	0.861	4.89	1.69
Our company implements special programs to minimize its negative impact on the natural environment.	0.839	4.35	1.94
Our company encourages its employees to participate in voluntarily activities.	0.769	3.89	2.01
Our company contributes to campaigns and projects that promote the well-being of the society.	0.711	4.54	1.79
Our company supports non-governmental organizations working in problematic areas.	0.673	4.42	1.95
Our company makes investment to create a better life for future generations.	0.805	4.58	1.87
Our company targets sustainable growth which considers future generations.	0.874	4.81	1.87
Stakeholders' sustainability pressures (Sarkis *et al.*, 2010) *a = .862, CR = .868, AVE = .527*			
Client pressure	0.717	4.99	1.73
Government pressure	0.598	4.33	1.81
Shareholders' pressure	0.799	4.70	1.81
Workers' pressure	0.747	4.52	1.64
NGO/society pressure	0.822	4.49	1.71
Competitors' pressure	0.650	4.12	1.81

GMS (adapted from Fraj-Andrés *et al.*, 2009; Papadas *et al.*, 2017) *a = .940 CR = .943, AVE = .529*			
We invest in R&D programs to create environmentally friendly products/services.	0.787	4.12	1.91
We invest in low-carbon technologies for our production processes.	0.786	4.14	1.99
We participate in environmental business networks.	0.726	3.98	2.02
We use specific environmental policy for selecting our partners.	0.796	3.77	1.89
We make efforts to use renewable energy sources for our products/services.	0.809	4.30	1.92
Among other target markets, we also target to environmentally conscious consumers.	0.755	4.12	1.88
We implement market research to detect green needs in the marketplace.	0.753	3.38	1.96
We use recycled or reusable materials in our products.	0.642	4.59	1.83
We prefer digital communication methods for promoting our products/services, because it is more eco-friendly.	0.597	4.87	1.74
We encourage the use of e-commerce, because it is more eco-friendly.	0.590	3.77	2.02
We absorb the extra cost of an environmental product/service.	0.690	4.42	1.92
Launch of green positioned brands onto the market.	0.750	3.76	1.95
Use environmental considerations in distribution and reverse logistics systems.	0.700	4.37	1.87
Use eco-labels or environmental certification.	0.743	4.11	2.10
Consider environmental aspects within price policy.	0.747	3.28	1.69
OR* (adapted from Fraj-Andrés *et al.*, 2009) *a = .873, CR = .876, AVE = .588*			
Final production costs	0.722	4.20	1.21
Product quality	0.624	4.97	1.18
Innovation capacity in new product development	0.845	4.89	1.36
Pace of new product launching and range of products in catalog	0.799	4.72	1.42
Cost-efficiency	0.823	4.37	1.30
FR* (adapted from Morgan *et al.*, 2004) *a = .935, CR = .937, AVE = .750*			
Firm's profitability	0.907	4.18	1.32
Sales growth	0.871	4.28	1.39
Firm's economic results	0.955	4.30	1.41
Profit before tax	0.890	4.21	1.40
Market share	0.684	4.60	1.27
GMRs (adapted from Chattopadhyay *et al.*, 2001)			
Availability of GMRs during the last 3 years of recession compared with the pre-crisis availability	-	3.55	1.38

* Both OR and FR were rated by respondents by assessing their current operational and financial performance *compared with the last three years of recession* (2011–2014).

Table 3. Descriptive statistics and correlation matrix

Construct	M	SD	1	2	3	4	5	6
1. CS	4.49	1.565	*0.793*					
2. SSP	4.52	1.241	0.632	*0.726*				
3. GMS	4.06	1.362	0.706	0.636	*0.727*			
4. OR	4.62	1.055	0.380	0.325	0.399	*0.766*		
5. FR	4.31	1.215	0.219	0.199	0.245	0.657	*0.866*	
6. GMR	3.55	1.380	0.592	0.468	0.560	0.512	0.450	-

Notes: Figures on the diagonal are the square root of the AVE of the respective construct. CS = corporate sustainability; SSP = stakeholders' sustainability pressure. All correlations are significant at the 0.01 level.

Table 4. Model estimation results

Structural relationships	Path estimates	t-values	Hypotheses	Results
Hypothesized paths				
CS → GMS	0.714	9.718***	H1 (+)	Support
SSP → GMS	0.233	3.098**	H2 (+)	Support
GMS→ OR	0.445	2.554**	H3 (+)	Support
GMS→ FR	0.469	2.713**	H4 (+)	Support
GMS × GMR → OR	0.137	2.124*	H6a (+)	Support
GMS × GMR → FR	0.159	2.226*	H6b (+)	Support
GMR → OR	0.738	6.521***		
GMR → FR	0.761	7.116***		
Controls				
Firm size → OR	0.135	2.005*		
Firm size → FR	0.333	4.947***		
Firm age → OR	0.124	1.908		
Firm age → FR	-0.029	-0.451		
Sector (reference: construction-remaking)				
FMCG → OR	0.019	0.219		
FMCG → FR	-0.036	-0.411		
Services → OR	-0.078	-0.891		
Services → FR	-0.017	-0.192		
Industrial products → OR	0.039	0.462		
Industrial products → FR	-0.074	-0.889		
Wholesaler/retailer → OR	0.050	0.636		
Wholesaler/retailer → FR	-0.036	-0.448		
Model fit				
χ^2 = 935.557, *df* = 417; RMSEA = 0.072; CFI = 0.893; SRMR = 0.069				

Notes: The significance of the indirect effect was estimated with bootstrapping 95% confidence intervals based on 5000 bootstrap samples (Hayes, 2009; Preacher and Hayes, 2004). CS = corporate sustainability.
***$p < 0.001$; **$p < 0.01$; *$p < 0.05$.

Figure 2. Moderating influences of GMRs on the relationships between GMS and resilience (financial and operational)

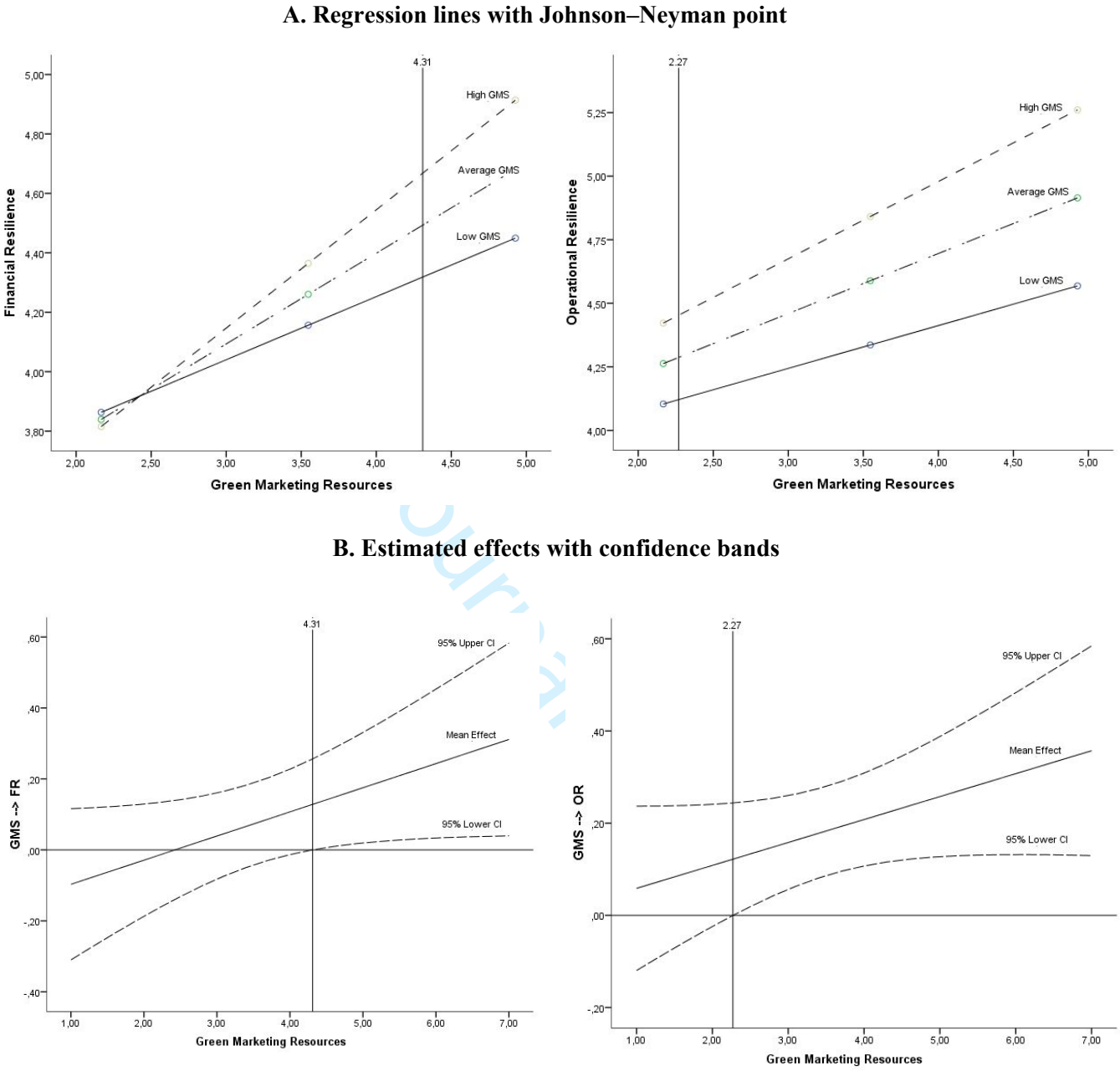

Figure 3. "Green" typology of companies

		GMRs		
		Increased	*Stable*	*Decreased*
GMS	*Engaged*	**Strategic green investors** N = 43 *Highly engaged in green strategy and present high availability of resources for green marketing investment even during a recession*	**Cautious green investors** N = 50 *Highly engaged in green strategy but hesitate to increase investment in GMRs during the recession*	**Green disinvestors** N = 36 *Highly committed to this strategy but divest resources from green investment activities during the crisis*
	Unengaged	**Opportunistic green investors** N = 8 *Unengaged in green strategy but highly invest in GMRs during a recession*	**Green reluctants** N = 37 *Poorly engaged in green strategy but keep a stable availability level of resources for green investment during the recession*	**Green non-believers** N = 71 *Unengaged in green strategy and do not invest in GMRs during a recession*

Table 5. "Green" typology of companies based on cluster analysis.

	Final cluster centers					
	Cluster 1 N = 58 **Reluctants**	Cluster 2 N = 58 **Disinvestors**	Cluster 3 N = 9 **Strategic investors**	Cluster 4 N = 12 **Opportunistic investors**	Cluster 5 N = 74 **Cautious**	Cluster 6 N = 34 **Non-believers**
GMS	2.96	4.35	5.93	3.69	5.36	2.29
GMR	4	3	6	6	4	1

Table 6. Resilience means across "green" groups and clusters

		Conceptual typology					
		FR			**OR**		
Company group	N	$F = 9.380$, $p < 0.001$			$F = 15.138$, $p < 0.001$		
Green non-believers	71	3.70 (1.06)			3.95 (1.15)		
Green disinvestors	36	4.09 (1.21)	4.09 (1.21)			4.54 (0.93)	
Green reluctants	37		4.40 (1.02)			4.62 (0.74)	
Cautious green investors	50		4.54 (1.27)	4.54 (1.27)		5.01 (0.73)	5.01 (0.73)
Opportunistic green investors	8		4.73 (1.68)	4.73 (1.68)		4.50 (1.33)	
Strategic green investors	43			5,10 (0.91)			5.40 (0.79)

		Empirical typology					
		FR			**OR**		
Company Cluster	N	$F = 7.740$, $p < 0.001$			$F = 12.650$, $p < 0.001$		
Green non-believers	34	3.78 (1.14)			3.91 (1.38)		
Green disinvestors	58	3.88 (1.13)			4.24 (0.97)	4.24 (0.97)	
Green reluctants	58	4.33 (1.15)	4.33 (1.15)			4.57 (0.76)	4.57 (0.76)
Cautious green investors	74		4.65 (1.08)			5.16 (1.28)	5.16 (1.28)
Opportunistic green investors	12		4.75 (1.50)			4.75 (0.75)	4.75 (0.75)
Strategic green investors	9			5.76 (0.94)			5.66 (0.87)

Notes: Variables measured on a seven-point scale. Figures in the different columns indicate significant differences based on comparisons ($p < .05$). Standard deviations are in parentheses.

A1 - Pretest - Sample characteristics

		(*N* = 85)	%
Market	B2C	58	68.2%
	B2B	27	31.8%
Firm's geographic scope	Domestic	48	56.5%
	Multinational	37	43.5%
Job position of respondents	Product/Marketing	61	71.7%
	Other managerial position	24	28.3%
Age of respondents (in years)	21–30	46	54.1%
	31–40	29	34.1%
	41–50	10	11.8%
Professional experience	>5 years	134	100%

A2 – Main survey - Sample characteristics

		(N=245)	%
Market	B2C	98	40.0%
	B2B	72	29.4%
	Both	75	30.6%
Type	Domestic	150	61.2%
	Multinational	95	38.8%
Sector	FMCG	62	25.3%
	Services	66	26.9%
	Industrial Products	50	20.4%
	Wholesalers & Retailers	34	13.9%
	Construction-Remaking-Other	33	13.5%
Age of company (in years)	1-5	19	7.8%
	6-10	25	10.2%
	11-20	38	15.5%
	21-40	59	24.1%
	>40	104	42.4%
Number of employees	11-50	61	24.9%
	51-250	73	29.8%
	>250	111	45.3%
Job title	Marketing manager	124	50.6%
	Product manager	43	17.5%
	CSR/Sustainability manager	38	15.5%
	CEO	40	16.4%
Age of respondents (in years)	21-30	65	26.5%
	31-40	111	45.3%
	41-50	56	22.9%
	51-60	10	4.1%
	>60	3	1.2%

A3 – Early-Late respondents' comparisons

	t (p)	Early Respondents N=122	Late Respondents N=123
CS	-.422 (.673)	4.45 (1.64)	4.54 (1.49)
SSP	1.733 (.084)	4.66 (1.11)	4.39 (1.34)
GMS	-.465 (.642)	4.02 (1.38)	4.10 (1.34)
GMR	-.622 (.535)	3.49 (1.49)	3.60 (1.26)
OR	.437 (.663)	4.66 (1.07)	4.62 (1.05)
FR	.426 (.670)	4.35 (1.22)	4.28 (1.21)

A4 - Common method variance test using marker variable

Correlation between	Original correlation	Marker-variable corrected correlation
CS – SSP	0.566***	0.566***
CS – GMS	0.714***	0.714***
CS – GMR	0.471***	0.471***
CS – OR	0.343***	0.343***
CS – FR	0.216***	0.216***
SSP – GMS	0.606***	0.607***
SSP – GMR	0.324***	0.324***
SSP – OR	0.312***	0.313***
SSP – FR	0.223***	0.225***
GMS – GMR	0.436***	0.435***
GMS – OR	0.367***	0.365***
GMS – FR	0.229***	0.226***
GMR – OR	0.400***	0.399***
GMR – FR	0.369***	0.368***
OR – FR	0.625***	0.622***

A5 – SDR scale items and correlation

	No of item in original Crowne-Marlowe scale		
SDR scale	11	You like to gossip at times (F)	
	15	There have been occasions when you took advantage of someone (F)	
	16	You are always willing to admit it when you make a mistake (T)	
	19	You sometimes try to get even rather than forgive and forget (F)	
	22	At times you have really insisted on having things your own way (F)	
	26	You have never been annoyed when people expressed ideas very different "from your own" (T)	
	33	You have never deliberately said something that hurt someone's feelings (T)	
Shared Variance		**Shared Variance between SDR scale and latent variables**	**Correlations between SDR scale and latent variable indicators**
	CS	3,24%	$0.13 < r < 0.18$
	SSP	2,37%	$0.04 < r < 0.20$
	GMR	2,78%	$r = 0.17$ (single item)
	GMS	3,61%	$0.02 < r < 0.21$
	OR	1,96%	$0.09 < r < 0.16$
	FR	2,25%	$0.1 < r < 0.18$

A6 - Discriminant validity test (Anderson and Gerbing 1988)

Comparisons		Constrained model		Unconstrained model		Chi-square difference		Discriminant validity
		χ^2	df	χ^2	df	$\Delta\chi^2$	Δdf	
CS	SSP	392.384	65	386.339	64	6.045	1	yes
	GMS	757.353	209	751.377	208	5.976	1	yes
	GMR	182.983	21	177.906	20	5.077	1	yes
	OR	292.430	54	273.013	53	19.417	1	yes
	FR	242.614	54	224.901	53	17.713	1	yes
SSP	GMS	682.629	189	676.066	188	6.563	1	yes
	GMR	108.244	15	100.198	14	8.047	1	yes
	OR	212.893	44	185.757	43	27.135	1	yes
	FR	187.283	44	165.589	43	21.694	1	yes
GMS	GMR	420.457	105	416.167	104	4.290	1	yes
	OR	617.188	170	592.954	169	24.234	1	yes
	FR	537.723	170	514.654	169	23.069	1	yes
GMR	OR	82.753	10	64.531	9	18.222	1	yes
	FR	37.502	10	29.585	9	7.917	1	yes
OR	FR	162.495	35	154.903	34	7.592	1	yes

A7 – Crosstabulation analysis results

			Green Clusters						
			Green reluctants	Green disinvestors	Strategic green investors	Opportunistic green investors	Cautious green investors	Green non-believers	Total
Green Groups	**Green reluctants**	N	37	0	0	0	0	0	37
		% within groups	**100.0%**	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
		% within clusters	**63.8%**	0.0%	0.0%	0.0%	0.0%	0.0%	14.7%
	Green disinvestors	N	0	34	0	0	2	0	36
		% within groups	0.0%	**94.4%**	0.0%	0.0%	5.6%	0.0%	100.0%
		% within clusters	0.0%	**58.6%**	0.0%	0.0%	2.7%	0.0%	14.7%
	Strategic green investors	N	0	0	9	5	29	0	45
		% within groups	0.0%	0.0%	**20.9%**	11.6%	67.4%	0.0%	100.0%
		% within clusters	0.0%	0.0%	**100.0%**	46.7%	39.2%	0.0%	18.4%
	Opportunistic green investors	N	1	0	0	7	0	0	8
		% within groups	12.5%	0.0%	0.0%	**87.5%**	0.0%	0.0%	100.0%
		% within clusters	1.7%	0.0%	0.0%	**58.3%**	0.0%	0.0%	3.3%
	Cautious green investors	N	7	0	0	0	43	0	50
		% within groups	14.0%	0.0%	0.0%	0.0%	**86.0%**	0.0%	100.0%
		% within clusters	12.1%	0.0%	0.0%	0.0%	**58.1%**	0.0%	20.4%
	Green non-believers	N	13	24	0	0	0	34	71
		% within groups	18.3%	33.8%	0.0%	0.0%	0.0%	**47.9%**	100.0%
		% within clusters	22.4%	41.4%	0.0%	0.0%	0.0%	**100.0%**	29.0%
Total		N	58	58	9	12	74	34	245

Pearson Chi Square value = 589.006, p<0.001, Cramer's V = 0.693, p<0.001.

A8 – Demographic profile of company groups (conceptual typology) and clusters (empirical typology)

		N 245	Green reluctants		Green disinvestors		Strategic green investors		Opportunistic green investors		Cautious green investors		Green non-believers	
			Groups	Clusters	Groups	Clusters	Groups	Clusters	Groups	Clusters	Groups	Clusters	Groups	Clusters
MARKET	B2C	40.0%	29.7%	34.5%	36.1%	46.5%	37.2%	44.4%	37.5%	41.7%	48.0%	40.5%	43.7%	35.3%
	B2B	29.4%	40.5%	36.2%	27.8%	19.0%	27.9%	33.3%	37.5%	41.7%	24.0%	27.0%	28.2%	35.3%
	Both	30.6%	29.5%	29.3%	36.1%	34.5%	34.9%	22.2%	25.0%	16.7%	28.0%	32.4%	28.2%	29.4%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
TYPE	Domestic	61.2%	56.8%	63.8%	69.4%	65.5%	46.5%	55.6%	37.5%	25.0%	56.0%	51.4%	76.4%	85.3%
	Multinational	38.8%	43.2%	36.2%	30.6%	34.5%	53.5%	44.4%	62.5%	75.0%	44.0%	48.6%	25.4%	14.7%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
SECTOR	FMCG	25.3%	24.3%	22.4%	19.4%	25.9%	34.9%	33.3%	37.5%	41.7%	24.0%	27.0%	22.5%	17.6%
	Services	26.9%	40.5%	31.0%	27.8%	20.7%	20.9%	33.3%	21.1%	37.5%	25.0%	27.0%	21.1%	29.4%
	Industrial Products	20.4%	18.9%	20.7%	22.2%	19.0%	18.6%	11.1%	19.7%	17.6%	25.0%	25.0%	19.7%	20.6%
	Wholesalers & Retailers	13.9%	13.5%	17.2%	16.7%	17.2%	14.0%	11.1%	15.5%	13.7%	0.0%	0.0%	15.5%	11.8%
	Construction-Remaking-Other	13.5%	2.7%	8.6%	13.9%	17.2%	11.6%	11.1%	21.1%	13.7%	0.0%	8.3%	21.1%	20.6%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
AGE OF COMPANY (IN YEARS)	1-5	7.8%	10.8%	8.6%	8.3%	6.9%	7.0%	11.1%	37.5%	16.7%	8.0%	8.1%	2.8%	2.9%
	6-10	10.2%	5.4%	10.3%	8.3%	10.3%	9.3%	0.0%	0.0%	8.3%	6.0%	5.4%	18.3%	23.5%
	11-20	15.5%	21.6%	15.5%	13.9%	15.5%	7.0	0.0%	12.5%	16.7%	20.0%	16.2%	15.5%	17.6%
	21-40	24.1%	27.0%	24.1%	30.6%	31.0%	18.6%	22.2%	0.0%	0.0%	22.0%	24.3%	26.8%	20.6%
	>40	42.4%	35.1%	41.4%	38.9%	36.2%	58.1%	66.7%	50.0%	58.3%	44.0%	45.9%	36.6%	35.3%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
NUMBER OF EMPLOYEES	11-50	24.9%	27.0%	27.6%	25.0%	22.4%	14.0%	11.1%	37.5%	16.7%	16.0%	18.9%	35.2%	44.1%
	51-250	29.8%	35.1%	29.3%	30.6%	34.5%	30.2%	44.4%	12.5%	16.7%	26.0%	25.7%	31.0%	32.4%
	>250	45.3%	37.8%	43.1%	44.4%	43.1%	55.8%	44.4%	50.0%	66.7%	58.0%	55.4%	33.8%	23.5%
	Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Note: Significant differences only found for company type (Pearson chi-square<0.05).

A9 – Measurement invariance test

Comparisons		Constrained model		Unconstrained model		Chi-square difference		
		χ^2	df	χ^2	df	$\Delta\chi^2$	Δdf	p value
GMS high	GMS low	2578.60	1397	2540.75	1364	37.84	33	.258
GMR high	GMR low	2616.82	1397	2593.40	1364	23.42	33	.891