

Perceived environmental turbulence and corporate strategy: the case of the UK recession

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ABSTRACT

The impact of the external environment on strategy is a long debate in the ‘traditional’ strategic management theory. In contrast, futures studies have a clearer view, having established that the environment is perceived and has a direct impact on how the future is anticipated. The same field has grown significantly, in the last two decades, with regards to how companies should foresight the future, looking into their external environment. However, we observe that there is a lack of retrospective research on how companies have embraced extreme environmental events, surprises and wildcards which led to crisis with regards to their perception of the external environment and the strategies developed for the future. This study fills in this gap with a multi-methodological approach, combining survey and archival data, to examine the relationship between the perceived environmental turbulence and corporate strategy in some of the largest UK listed companies. We use the recession of the UK economy in 2008 as the key phenomenon to compare the relationship between perceptions of the environment and corporate strategy before the economic recession (2007) and after (2009). With our analysis, we provide evidence of how the environment influences corporate strategy and we show how a wildcard, like the recession, changed the perception of environmental turbulence which resulted into greater adoption the risk averse, retrenchment strategies.

Key Words:

Perceived Environmental Turbulence, Wildcards, Extreme Events, Subprime crisis, Corporate Strategy,

INTRODUCTION

Changes in the external environment are a constant reality for managers. These changes create insecurity and uncertainty about the future due to lack of information (Elahi, 2011). Large scale changes lead to environmental turbulence as the volume of the unpredictable factors in the environment increases (Ilmola and Rovenskaya, 2016). Some of these changes are emerging events which are considered as trends (Makridakis et al., 2009) while others are unexpected changes which the futures literature considers as wildcards (Mendoza et al., 2004) or surprises (Derbyshire, 2017). In the ‘traditional’ strategic management literature, the impact of the environment has been examined in numerous studies (Lueg and Borisov, 2014) since early studies (March and Simon, 1958; Lawrence and Lorch, 1967) showed the importance of the environment for organizational performance. However, the majority of these studies (Balabanis and Spyropoulou, 2007; Rueda-Manzanares, Aragón-Correa, and Sharma, 2008) consider the environment a contingency factor of the strategy-performance relation. At the same time, research has determined that environmental turbulence can impact both the strategy process (Hoffmann et al., 2017; Li et al., 2022) and content (Anderson and Tushman, 2001; Gemisi and Zehir, 2021; Roper and Tapinos, 2017).

The existing research on perceived environmental turbulence has examined the impact of the environment either at ‘random’ timing (e.g. Brouthers, Brouthers, and Werner, 2002) or at times when significant changes were taking place with uncertain and unpredictable consequences such as regulation (Engau and Hoffmann, 2011) or changes in the competitiveness of the company (López-Gamero et al., 2011). Cunha et al (2012) show that extreme events or ‘surprises’ create different perceptions of the environment; while Moqaddamerad and Tapinos (2022) show how the perception of uncertainty is a trigger for sensemaking the future which leads to business model innovation and updates of the business model. Therefore, in this paper, we innovate by collecting data at two different periods. We examine the impact of perceived environmental turbulence before the economic recession (2007) in the UK, when managerial perception was not so strongly influenced by the uncertainty of the economy and at the beginning of the recovery (2009) from the recession when managerial perception would be influenced by the experiences from the tough economy climate and the uncertainty of the future.

Our paper contributes to the literature which examines the relationship between perceptions of the environment and strategy. Recognizing different levels of strategy (Vancil and Lorange, 1975), we build on research (Dutt and Joseph, 2019; Gils et al. 2004) which examined the impact of perceptions of the environment for generic strategies, and we investigate at the corporate level. In this research, we innovate as we use strategic risk theory (Baird and Thomas 1985; Sax and Andersen, 2019) to link corporate strategies with the risk behavior of the companies under perceived uncertainty. Our paper extends the findings that perceptions of the environment influence managerial decision making and particularly lead to responsive strategies (Harrington et al., 2005; López-Gamero et al., 2011). Our paper does not only show that perceived environmental turbulence influences corporate strategy but it also shows that post the economic recession, greater levels of perceived turbulence were associated with more risk averse strategies.

In the following sections, we firstly review the literature on strategy content with emphasis on typologies of corporate level strategy. Then, we synthesize the literature on perceptions of the environment and its main dimensions; and highlight the existing research on strategy and perceptions of the environment. The gaps in the literature leads us to set two hypotheses about the perceptions of the environment by top management teams managers at large organizations and its relationship to corporate strategy. The methodology explains how we collected and analysed the data. Finally, our results show a difference in the perception of the environment before and after the UK recession and a weak linkage of perceived uncertainty to one of the corporate strategy types.

LITERATURE REVIEW

Corporate Strategy

Accepting that there is a natural division between strategy process and content research in strategic management literature, in this paper we have selected to concentrate on the strategy content. Process studies concentrate on the activities taking place when strategizing (Huff and Reger, 1987) and strategy content research focuses on what the strategic decisions-strategies are (Bowman and Ambrosini, 2003). This selection was made on the basis that corporate strategy matters (Bowman and Helfat, 2001) and

that no existing research has examined the impact of the environment to the content of the corporate level strategy before determining whether there is a relationship between them.

There are various taxonomies and classifications of strategy content theory (Fahey and Christensen, 1986); in this article we start with the basic premise that the strategy content is divided into three organizational levels (Vancil and Lorange, 1975; Bourgeois, 1980): i) Corporate level strategies concern the domains that the company operates in, diversifies into, exits from and the way it manages its business units; ii) Strategic Business Unit (SBU) strategies concern the strategies at the industry level with emphasis on product-market decisions and iii) Functional Level strategies which concern the operation, marketing, finance etc. of each department. The majority of the strategy content papers are concentrated on SBU level strategy examining particularly Porter's Generic Strategies (see Kim et al., 2004, for a review) or Miles and Snow's typology (see DeSarboet al., 2005).

A significant stream of the corporate strategy literature has examined the relationship between corporate – SBU strategies (Gupta, 1987). Subsequently, the research on corporate level strategies has been focused on diversification either as products, or markets and geographies (Desset al, 1995) or whether diversification is horizontal or vertical (Christensen, 2002). The underpinning philosophy for this direction is that diversified organizations would have distinctively different strategies at corporate and SBU level (Montgomery, 1985). Therefore, the majority of the studies examine how corporate strategies will impact the diversification decisions. This dichotomy, diversify or not, is a rather fragmented look into corporate strategies. It is possible for companies to implement different corporate strategies even when they do not diversify which would not be captured by these typologies.

Ambrosini and Bowman (2003) examined corporate strategy as eight different 'rationales': 1) portfolio planning; 2) synergy; 3) core competence; 4) sticking to the knitting; 5) internal growth; 6) external growth; 7) survival and 8) spreading risk. Although this is a very comprehensive framework, it focuses on the way corporate strategy is developed and not on its content only. Engau and Hoffmann (2011) created a new classification of corporate strategy factoring previous models of strategy into: offensive, defensive, and passive; showing that corporate strategy does not have to be expressed in terms of

diversification only. In this research, we have selected the ‘Grand Strategy’ (Hitt, Ireland, and Palia, 1982; Judge et al., 2003) as the research framework. It is in our opinion, it the most comprehensive corporate strategy model which describes the four basic strategic orientations at this level: 1) Retrenchment; 2) Stability; 3) Internal Growth; 4) External Growth.

Retrenchment

Retrenchment’s basic premise is the exit of a company from one or more business units. This is realized by selling the business unit or in some extreme cases by closing it down. Retrenchment, as a concept is more inclusive than Anderson and Tushman’s (2001) ‘exit’, as it encompasses the selling of the business via merger or acquisition. This strategy adopted when companies are not performing as desired or targeted or in cases of refocusing the business on core competences. Robbins and Pearce (1992) determined that retrenchment is the key strategy for turnaround of poorly performing companies. Overall, retrenchment reduces the exposure of the organization, and therefore it could be considered a risk adverse strategy.

Stability

Stability is the corporate strategy where no changes or new initiatives are introduced, the company maintains its existing business units in the same markets with the same products/services. This strategy neither increases nor decreases the risk exposure of the company. However, for large companies a stability strategy should be considered a risk adverse strategy. Although, there are evidence (Harrington et al., 2005; Jauch and Kraft, 1986) that environmental turbulence will lead companies to seek for opportunities in the environment, Mintzberg (1987) explains that the essence of strategy is to provide stability to the organization and therefore in turbulent environments there is expectation that companies will seek to reduce their perceived uncertainty with minimizing exposure.

Internal Growth

Internal growth is the type of strategy that seeks to expand the activities of the company, either in terms of products/services or markets, based on organic growth. Internal growth is expressed with i) emphasis

on R&D to develop new products/services or to improve the characteristics of the existing ones and ii) with the opening of new markets with the existing or new products. Internal growth strategies contain a certain level of risk which is associated to the level of the investment.

External Growth

External growth strategies are similar to internal growth with the exception that they are not organic and require linking with other companies in the form of merger and acquisition or strategic alliance, joint venture. The international business (Hill et al, 1990) and merger and acquisition (Shimizu et al., 2004) literatures have shown that external growth strategies are associated with higher levels of risk.

The Grand Strategy typology was originally conceived by Glueck (1976) and later tested in empirical studies (Hitt et al., 1982; Hitt and Ireland, 1985). The influential character of this typology was highlighted by Boyd and Reuning-Elliott (1998) who claims that this is the root of most strategic planning theory. This typology is a more complete classification of corporate strategy as it includes retrenchment and stability which are both potential strategic options. Moreover, Grand Strategy includes diversification within the third and fourth option (internal and external growth); however, it recognizes that a potential strategic option is the organic (internal or external) growth. The purpose of this typology is to establish the overall strategic direction and intent of the organization. It also signifies the risk-taking orientation of the organization by differentiating between the two growth approaches.

Strategic risk behaviour of individuals and organizations is central to strategic management theory. Although significant research efforts (Ruefli et al., 1999) have been made to develop measures of strategic risk behaviour, there is limited guidance on how to classify the level of risk associated with different strategies (Noy and Ellis, 2003). In this paper, we have followed the conceptualization of Baird and Thomas (1985) and the definition by Sitkin and Pablo (1992), who consider more risky strategies to create greater exposure of the resource investments by the company, with less control on the successful outcome. Thus, we have considered that there are different levels of risks associated with each of the four strategic postures in this model, with retrenchment bearing the lowest level of risk and external growth the highest (Robbins and Pearce, 1992). Pearce et al. (1987) showed that there is no

significance in the performance between these types of strategy, confirming that there is no 'best' strategy type. This is very important, as it allows us to consider that managers will pursue the strategy that they think fits best in their organization based on their perception.

Perceptions of the Environment

Environmental turbulence is a state of environment where there are increased levels of uncertainty, dynamism and complexity. Emery and Trist (1965) described turbulent environments as the most dramatic in terms of dynamic factors that change in the environment creating unpredictability and ambiguity in the decision making. There are two basic approaches to conceptualize the perceptions of the environment: i) factors from external and internal environment (Priem et al., 2002); ii) dimensions of the environment (Dess and Beard, 1984). In terms of factors of the environment, a lot of progress has been achieved since the pioneering works of Dill (1958) who distinguished between task and general environment. Lawrence and Lorsch (1967) operationalized further Dill's divisions and later Miles and Snow (1978) provided a significant contribution by identifying six influential factors of the environment. Subsequently, Priem et al (2002) have determined an integrated list of factors which include: international competitive advantage, industry competition, products/costs, human resources, governments, societal changes. Regarding the dimensions of the environment (Duncan, 1972) had identified two key dimensions: i) dynamism-static; and ii) complex-simple. Later, authors like Dess and Beard (1984) verified Stickel's (2001) coding of the environmental dimensions as: munificence with regards to capacity, dynamism concerning the stability and complexity referring to the level of homogeneity.

There is no standard terminology used in the relevant literature (see Frishammar, 2006, for an extensive review). Although, uncertainty is the most commonly used term, in some articles, uncertainty is a subset of environmental dimensions (Rueda-Manzanares et al., 2008). In this article, we have focused on the dimensions of the environment and we have conceptualised perceived environmental turbulence as the result of perceived environmental uncertainty, dynamism and complexity. Our conceptualisation is

similar with other authors in the field (see for example Anderson and Tushman, 2001; Fores and Camison, 2016; Sabherwa et al., 2019; Volberda and H., 1998).

Uncertainty

Uncertainty concerns the inability or difficulty to anticipate the potential changes in the environment and their impact upon the industry and the business (Miller, 1993). Uncertainty is created by the lack of adequate information about the environment. Previous studies (Rueda-Manzanares et al., 2008) have shown in the face of uncertainty managers try to become proactive either by establishing long term investments or by reducing exposure to risk.

Dynamism

Duncan (1972) refers to the stability of the environment as one of the key dimensions that shape the managerial perception of the environment. According to Dess and Beard (1984) dynamism is related to the rate of change in the environment and subsequently the unpredictability of those changes by managers. Richard et al. (2019) confirmed that dynamism influences the strategy development process. Garg, et al. (2003) explain that increase in perception of dynamism leads in intensifying the scanning process within strategy development.

Complexity

Duncan (1972) considers the level of homogeneity/heterogeneity in the environment to create a perceived level of complexity. Sharfman and Dean (1991) define complexity as '*the complex knowledge that the understanding of the environment requires*'. The complexity as a result of the heterogeneity in the environment is influenced by the number of stakeholders and factors that affect the environment on organization (Ashill and Jobber, 2010). Although, there are some authors who have examined perceived complexity as endogenous (Neill and York, 2012; Ketokivi and Castañer, 2004; Williams et al., 2019),

in this paper we have considered perceived complexity an exogenous dimension (Miller and Friesen, 1983).

Building on Weick's (1969) argument that the understanding of the environment is based on perception, Lipshitz and Strauss (1997) explain that the same external environment is interpreted differently by each individual. Santos et al.(2006) extend this argument by determining the existence of bias in managerial opinions when perceiving the environment. Although, there is a growing body of research, particularly in cognition (Hodgkinson et al., 1999) that recognizes the difference in the perceptions of the environment, it is not well established whether this difference is significant. Thus, the first hypothesis of this research examines whether there are significant differences in the perception of environmental turbulence. Based on the fact that the understanding of the environment is perceived we hypothesise that (H1) *there is variation in the way managers perceive environmental turbulence.*

Strategy and the Environment

Traditionally strategic management research has considered the environment to be a contingency factor of the strategy – performance relationship and therefore most of the research has examined the moderating effects of the environment. The differences in the conceptualization of environmental turbulence are fundamentally rooted in the different ontological stances with regards to the existence of reality. Authors, like Becker and Knudsen (2005) and Galbraith (1973), stand of the realist view of an objective environment, while authors like Duncan (1972) represent the nominalistic view that there are perceptions of the environment. These trends were captured by Jauch and Kraft (1986) who identified three dominant views on the impact of the environment: i) classical view where there is a reality of an objective environment that influences decisions, ii) transition view accepts the existence of internal and external turbulence but also considers that managers can influence the environment and iii) process view which does not accept an objective reality but managers' perceptions of the environment.

Dutton and Jackson (1987) theorized how the perceptions of the environment could lead to different strategic interpretations on whether factors of the environment are opportunities or threats. The same

authors define opportunities as ‘*positive situation in which gain is likely and over which one has a fair amount of control*’ and threats as ‘*negative situation in which loss is likely and over which one has relatively little control*’. Thus, perceived environmental turbulence is affected by the perceived potential gains and the level of control that managers have over their environment. Schneider and Meyer (1991) provide a framework for understanding how perceptions of the environment are interpreted in order for a strategic response (-change of strategy) to be adopted. They show that stimulus for the environment creates a perception of opportunity/threat or crisis, which leads to selecting whether the strategic response will be risk taking or averting and whether it will be realized internally or externally. Hence, it is understood that the same environmental factor could lead to different strategies based on the managerial perception. The strategic risk behaviour toward the perceived environmental turbulence has created two conflicting theories (Shimizu, 2007): prospect theory (Kahneman and Tversky, 1979) and threat-rigidity theory (Staw et al., 1981). Acknowledging that these two theories concern different organisational levels, their combination is considered to provide richer pictures through multilevel analysis (Hitt et al., 2007). The basic difference between these two theories lies in the level of risk that managers are prepared to take under high levels of turbulence. Prospect theory (Kahneman and Tversky, 1979) stipulates that managers tend to focus on opportunities at times of increased environmental turbulence while threat-rigidity theory (Staw et al., 1981) suggest that in same environmental conditions managers are more risk averse.

Most of the existing research examines the impact of perceptions of the environment on environmental scanning as a part of strategy making (O'Brien and Folta, 2009). Studies (e.g. Hambrick, 1982) have shown that there is a link between environmental scanning and the content of the strategy. Gils et al. (2004) have examined perceptions of the environment and business level strategy. To our knowledge, none of the existing studies have attempted to examine the relationship between perceptions of the environment and the content of the strategy at the corporate level.

Anderson and Tushman (2001) concluded that perceptions of the environment influence the outcome of the strategic planning process. Hoffmann et al, (2009) also show that a particular type of uncertainty (regulatory) has an impact on the strategies adopted. Christensen (2002) determined that there are

different responses to high levels of perceived turbulence. Past studies (Miles and Snow, 1976; Srinivasan et al., 2011) have shown that high levels of perceived turbulence lead to the adoption of more risky strategies. Other studies (Smart and Vertinsky, 1984; Harrington et al., 2005) have shown that companies lean towards more defensive (less risky) strategies on the face of environmental turbulence. In particular, studies focused on economic recessions (Andersen, 2004; Gils et al., 2004) have shown that companies tend to change their strategic direction due to the recession. Thus, we set up the hypothesis that (H2) *the perception of the environment influences the content of the corporate strategy.*

METHODOLOGY

This study combines two research methods, two surveys of large listed companies from the UK and a content analysis of their annual reports. The purpose of designing a multi-methodological approach was to collect perceptual and objective data. The perceptual data concerned the environmental turbulence and the objective data the corporate strategy. The survey was sent to members of the top management team from the 10 largest in capitalisation listed companies from 24 industries as listed in the London Stock Exchange. The survey was first conducted in 2007 and was repeated in 2009. At the moment the responders were filling in the survey 2007 (May-July) the subprime crisis in US and the subsequent economic globally and in the UK had not started yet. During the period that the responders were filling in the survey in 2009 (May-July), the first signs of the economic recovery had emerged for the UK as this was the point that the UK economy has moved out of recession. In this project the timing of the surveys is very important as the scope of the project is to capture the perceived environmental turbulence and its impact on managerial decision making as expressed by the corporate strategy. We analysed the annual reports of the same years 2007 and 2009 which were published in the periods that the survey was conducted which improves the connection between perceptual and objective data.

The survey in 2007 had 83 useable responses with a response rate of 35% and in 2009 had 71 useable responses corresponding to 29.5% response rate. The response rates of these surveys compares

favourably to similar studies with top management team members as responders (Waldman, et al., 2001; Balavanis and Spyropoulou, 2007, Tapinos et al, 2011). All responders were members of the board of directors which is significant for this study as they were directly involved in the development of the strategy. The greatest majority of the responders were Chief Executive Officers (42% in 2007; 55% in 2009); with significant participation by Chairmen (13% in 2007; 14% in 2009), Chief Finance Officers (11% in 2007; 13% in 2009), Chief Human Resources Officers (15% in 2007; 9% in 2009) and Chief Marketing Officer (12% in 2007; 5% in 2009); the rest of the responders where other members of the board of directors such as Chief Operation Officers and Chief of Sustainability Officers.

Measures

Perceived Environmental Turbulence

As explained in the literature review, there are several conceptualizations and measures for dimensions of the perceived environment. Although, there are some studies which have used a single dimension of the environment to measure managerial perception (see Ashill and Jobber, 2010 for a review), in this paper, we have used a three-item scale which include perceived uncertainty, dynamism and complexity. Following Stern and York (2012) each of the three items was measured with a low to high (complexity/dynamism/uncertainty) likert ten-point scale. Perceived dynamism and complexity are based on Duncan's (1972) conceptualization, and given the emphasis placed on later studies (Rueda-Manzanares et al., 2008) on perceived uncertainty as an environmental characteristic of perceived turbulence we have include it as the third item of the scale.

Corporate Strategy

To identify the corporate strategy of the organization, we used content analysis on annual reports. The use of annual reports is a well-established approach (Miller and Frasier, 1980; Ambrosini and Bowman, 2003; Kaplan, 2011), as it improves the reliability of the research as annual reports remove the element

of subjectivity by the responder. We measured corporate strategy using the Grand Strategy classification scoring: 1 for retrenchment; 2 for stability; 3 for internal growth and 4 for external growth. This measure was used because it is a tested framework (Hitt et al., 1982; Hitt and Ireland, 1985; Pearce et al., 1987) and describes accurately the possible strategies that a company could implement at corporate level. We gave the lowest score to retrenchment as it is the most risk adverse strategy and the highest score to external development which corresponds to strategies with the greatest level of risk. As explained in the literature review, the Grand Strategy classification is consistent with other conceptualizations of corporate strategy which concentrate on diversification, with the notable exemption that it is more inclusive as it also contains the option of 'stability' and 'retrenchment'. It is worth emphasizing that Hitt et al (1982) used annual reports to 'triangulate' responders' responses with regards to Grand Strategy and deduced approximately 80% similarity.

To deduce the Grand Strategy, we coded the statements by the Chairman and the CEO. Hitt et al (1982) suggests that there is one overall Grand Strategy which dominates the others. The coding process was performed in two stages: i) isolate the statement of the corporate strategy in the annual report and ii) categorise according to the Grand Strategies definition (Pearce et al, 1987). Retrenchment was stated with phrases indicating the sale of business units and/or exit from markets. Stability was usually expressed either as lack of any of the other strategies or as a continuum of the existing ones. Internal growth was identified with expansion into new markets and/or investment in new products on its own. External growth was expressed with growth strategies which involved either merger, acquisition, joint venture or some sort of strategic alliance. On a limited number of occasions that there was ambiguity on which of two strategies was the dominant one, these were all given to an experienced colleague (Miles and Huberman, 1984) with whom there was 90% inter-code reliability.

Data Analysis

We used model-based cluster analysis to identify the presence of cognitive groupings within the firms. Model-based clustering was chosen: firstly, because it tests specifically for the presence of no clusters.

Secondly because it uses a statistic the Bayesian information criterion (B I C) in order to test for the appropriate number of groups. This method addresses specific previous criticisms on the use of cluster analysis in management research (Lazonick and Mazzucato, 2013) and has been successfully deployed in previous research (Sgourev, 2013). The variables used in clustering were complexity, dynamism, uncertainty and a factor representing the different industries that our firms were drawn from. In accord with accepted practice these data were standardized to z scores in order to ensure that each element received equal weighting (Delmas, 1999).

Using R, we used multinomial regression to regress complexity, dynamism, uncertainty and cluster upon grand strategy. In keeping with the standard assumptions for multinomial logistic regression we make no assumptions of normality, linearity, and homogeneity of variance for the independent variables. Our chosen reference level was grand strategy 2; firstly, because this was the most common level and this choice therefore follows accepted practice (Lorenz, 1994), secondly, because this accords to “business as usual” i.e. no change. The model converged quickly and our sample size exceeds the recommended minimum of 10 observations per covariate (Hosmer and Lemeshow, 2000).

RESULTS

Table 1 shows the frequency of the four strategy types by year. Clearly the most common strategy deployed across both years was “stability” which is “doing nothing” or “sticking to the knitting”, represented by grand strategy (GS) two.

TABLE 1 ABOUT HERE

The means and standard deviations of the main explanatory variables used in this research are shown in table number 2.

TABLE 2 ABOUT HERE

Examining the means it is interesting to note that with the exception of grand strategy two, the average value for dynamic, and uncertain are markedly lower for 2009 than for 2007. Testing these observations using the Welch Two Sample t test we find that the difference between 2007 and 2009; for complexity is not significant ($t = 0.274$, $df = 137.898$, $p\text{-value} = 0.786$), for dynamism is not significant ($t = -1.5213$, $df = 140.571$, $p\text{-value} = 0.130$). In contrast for uncertainty, we find the two measures to be significantly different ($t = 3.2696$, $df = 144.365$, $p\text{-value} = 0.001$).

Using model-based clustering we find no significant groups within 2007 and these results can therefore reliably be viewed in aggregate. In contrast, for 2009, we find two distinct clusters to be present. Table 3 shows the means and standard deviations for our three key strategy measures for each of the clusters found in 2009.

TABLE 3 ABOUT HERE

Examination of table 3 shows a clear difference between these clusters with the mean values for complexity, dynamism and uncertainty all markedly lower in cluster 2 than in cluster 1. Using the Welch Two Sample t test we find that the difference between clusters for all three measures is significant; complexity ($t = 2.4128$, $df = 46.888$, $p\text{-value} = 0.020$), dynamism ($t = 3.5965$, $df = 48.407$, $p\text{-value} = 0.001$), and uncertainty ($t = 1.7198$, $df = 55.916$, $p\text{-value} = 0.09$).

Examination of these basic statistics reinforces the argument that the environment changed between 2007, when first measured and 2009, our second measurement. Notably the mean values for dynamism and uncertainty drifted down during this period, with the exception of grand strategy 2, our benchmark

– change nothing strategy. Whereas the environment may effectively be viewed as homogeneous during 2007, a clear change occurred by 2009 when two distinct clusters were found within these data.

FIGURE 1 ABOUT HERE

Figure 1 provides a direct comparison of the mean values for each item of the turbulence scale for the one cluster identified for 2007 and two identified for 2009. Taking the cluster from 2007 as the basis of comparison, we observe that in 2009 there is a cluster of companies that perceive very high levels of turbulence with a dramatic increase in the perceived uncertainty and there is a cluster of companies which perceive lower levels of complexity and dynamism after the economic crisis..

The results for the multinomial regression for 2007 are shown in tables 4 and 5. These tables show respectively the partial effects for a multinomial regression where grand strategy 2, our most frequent category serves as the benchmark, and a Type II analysis of deviance for this model. The results illustrated in table 4 are for a multinomial logit model with grand strategy (GS) as our response variable. In this regression we control for both revenue, measured as a natural log, and industrial sector (Global Industry Classification Standard, GICS (Standard and Poor, 2002)). However, neither of these control variables were found to exert a significant influence. Examining the coefficients in table 4 we find that an increase in dynamism significantly decreases the probability of a company shifting from strategy two to strategy one ($t = 2.15$). Increased dynamism also decreases the likelihood of a move from grand strategy 2 to 3 ($t = 2.02$) as does the combination of an increase in complexity accompanied by an increase in dynamism ($t = 2.36$). In contrast a rise in uncertainty heralds a decrease in the probability of adopting grand strategy 4 ($t = 2.41$), while the probability of moving from grand strategy 2 to 4 is increased if uncertainty and dynamism increase ($t = 2.62$).

TABLE 4 ABOUT HERE

Examining the overall model in Table 5, (AIC: 224, Residual Deviance: 182), we find that the measures that most significantly improve our model are two interaction terms comp:dyn ($p < 0.009$) and unc:dyn ($p < 0.042$). Overall the results for 2007 suggest firstly that different factors act as differing triggers which may lead to a change in strategy and secondly that constructs such as dynamism and uncertainty may act in concert and together influence a change in strategy.

TABLE 5 ABOUT HERE

The results for 2009 indicate a greater degree of change than was present in 2007 with more factors coming into play. Examining the coefficients in table 6 we find that a rise in complexity led to increased probability of a move from grand strategy 2 to grand strategy 1 ($t = -2.03$). In contrast to 2007 we find that revenue significantly affects strategic choice. An increase in revenue was found to herald a drop in the probability of either moving from grand strategy 2 to 1 or 2 to 3. For 2009, moving from the cluster 1 to cluster 2, also led to a sharp decrease in the probability of adopting strategy 1 in favor of grand strategy 2 ($t = 4.27$). An increase in complexity accompanied by an increase in either dynamism or uncertainty also led to a drop in the probability of changing strategy from 2 to 1.

In moving to grand strategy 3 we find that the likelihood of this move occurring is significantly decreased by an increase in uncertainty ($t = 3.25$), an increase in revenue ($t = 3.47$), or the combination of an increase in uncertainty accompanied by an increase in dynamism (2.36). The move from cluster 1 to 2 also reduced the probability of adopting grand strategy 3 when accompanied by an increase in dynamism ($t = 3.28$).

Finally, examining the factors that explain the movement between grand strategy 2 and 4 we find that an increase in complexity markedly increased the probability of moving ($t = -23.49$). An increase in dynamism similarly increased the probability of a move ($t = -4.34$), while moving from cluster 1 to

cluster 2 led to a decreased probability of a strategic shift ($t = 13.09$). The combination of increased uncertainty within cluster 2 also led to a decreased probability of a move.

TABLE 6 ABOUT HERE

Overall the model for 2009 indicates a much more dynamic environment with a larger number of factors influencing strategic change. Our overall model (AIC: 176, Residual Deviance: 79.5) appears a good fit to the data where the main explanatory factors overall are the combination of complexity and dynamism, together with the difference between the two clusters found to be present in 2009.

TABLE 7 ABOUT HERE

Examining the results overall, we find evidence of marked changes between the first period studied (2007) and the second period (2009). In particular the market moved from being effectively homogenous in 2007 to consisting of two distinct clusters in 2009. This is despite the larger number of firms included in the 2007 sample. Whereas we find that some main effects such as complexity or uncertainty significantly predict strategic change we find the situation to be inherently more complex than that with a combination of factors frequently exerting a stronger effect on strategic choice.

Limitations

Our study has some limitations worth highlighting before discussing our results. First, all our responders are from large UK based publicly listed companies; although the greatest majority of our responders are MNE, we consider that this limits the generalizability of our findings. Future studies should compare

responses over the same period from companies that are listed in different countries. Also, our study is weakened by the fact that only 60% of the responders in 2007 provided a response in 2009. It is well established that it is beyond the researchers' control to ensure that the same companies will respond to a survey two years later.

DISCUSSION

Implications for theory

The ultimate aim of this paper is to examine the relationship between perceived environmental turbulence and corporate strategy. Our analysis allows to theorise for this relationship before and after an extreme event, the economic recession in the UK. The analysis of our data provides contrasting findings about the managerial perception before and after the economic recession. Before the recession, there is no significant variation in the perceived environmental turbulence. This finding does not agree with those studies that have compared perceived environmental turbulence in different industrial sectors (Sutcliffe and Huber, 1998; Brouthers et al., 2000) and found that this is significantly different. Moreover, when we controlled for industrial sector we did not find significant impact. These results lead to partially accept the first hypothesis. Specifically, we deduced that the perceptions about environmental turbulence varied only under an extreme event (financial crisis).

Our findings contribute to the growing body of research on the impact of large-scale unexpected events and crises on managerial perception. Our study has been centred on an unexpected and extreme event the economic crisis. Our research confirms previous studies (such as Zuniga-Vicente et al., 2004) which have determined that extreme events have significant effects on industry structure. A significant number of studies (see Mazzucato and Tancioni, (2008) for a review) have shown that managers, directly involved with the corporate strategy of the organization, focus their environmental scanning activities on events that they consider important. Extending this discussion, this research reinforces the maturity model for organisational foresight (Rohrbeck, 2011), as it shows that within different levels environmental turbulence, different levels of foresight sophistication are required. Thus, we can

attribute the corporate strategic choice of retrenchment to the perceived environmental uncertainty. This leads us to accept our second hypothesis confirming the impact on the environmental turbulence on corporate strategy.

Rosenbusch et al. (2013) claimed that the effects of economic crisis lasted 10 to 18 months, however in 2008 there were no indications that the crisis will be overcome within a short period. Although, when we conducted the second survey 2009, officially there was no recession any more, nevertheless, there were speculations about a 'double dip recession' (Lueg and Borisov, 2014). Considering the ambiguity of the economic climate in 2009 and the finding that high levels of uncertainty are associated with retrenchment strategy, we are concluding that the grand strategies developed by the participating companies were proactive in terms of reducing exposure to risk (Rueda-Manzanares et al., 2008) for the perceived turbulence of the environment rather than being reactive to the end of the crisis. Pearce and Michael (2006) identified two potential clusters of strategies for survival to an economic recession: '*recession-proofing*' and '*recession-fighting*'. Our findings show that in the case of large UK organizations, the perception of uncertainty after the recession is associated with '*recession-proofing*' (Aaron, 1994).

Regarding our finding that higher levels of perceived environmental uncertainty are associated with retrenchment, this extends the findings of (Anderson and Tushman, 2001) who determined high levels of uncertainty to be associated with industry exit and Rueda-Manzanares et al (2008) who have found positive relationship between uncertainty and proactive management. In our study, proactive management is expressed as reducing the risk exposure by retrenching some business units (Rueda-Manzanares et al., 2008).

The two clusters created for 2009, are significantly different in all three variables (uncertainty, dynamism, complexity). Cluster 1 includes the companies whose responder perceived significantly higher levels of turbulence from the environment than those of cluster 2. Looking into the grand strategies in each cluster, it is worth noting that the companies from cluster 2 have smaller probability

of retrenchment than stability. Overall, we tested the probability of moving from GS 2 (Stability) to other strategies, we mostly found evidence that confirm that greater levels of turbulence will be associated with more risk averse strategies., which reinforces the threat-rigidity theory (Staw et al, 1981). One notable exemption was in 2007, when increased uncertainty and dynamism resulted in higher probability of moving from grand strategy 2 to grand strategy 4, which is consistent with prospect theory (Holmes et al., 2011). This can be explained by the fact that before the economic crisis, there was a stronger orientation for companies to consider uncertainty and dynamism as motivations and/or opportunities for expansion.

Our finding that, in 2007, strategic risk behaviour of the companies matches the prospect theory can be attributed to the stability of the environment. The majority of the prospect theory studies (see Bromiley et al., 2001) have been conducted within relatively stable environments. The only notable exemptions is Zona's (2013) study which was conducted during the same time like our survey (2009) and found that the largest Italian companies were more risk-taking during the recession which the author deduced as a proof of prospect theory. On closer examination, Zona's conceptualization of strategy riskiness was expressed in terms of innovation and R&D investment which makes incomparable to our study. The fact that our study provides support for two opposing theories is worth noting but it is not a unique finding; Chattopadhyay et al (2001) also deduced partial support for both theories. Although our data do not allow us to explain this phenomenon we consider that it provides greater reinforcement for our claim that the perceptions of the environment influence corporate strategy.

Contrasting of the findings from the subprime crisis of 2007, it is worth putting it into perspective. The subprime financial crisis is classified as a 'black swan' – low predictability high impact (Taleb, 2004; Bjorck, 2016). Comparing it to the recent Covid-19 pandemic (Donthu and Gustafsson, 2020), we observe that this was too a 'black swan' but its impact was much higher than that of the subprime crisis, as apart from the financial implications, there were lockdowns, significant number of hospitalisations and deaths, as well as disruptions of global supply chains which were not evident in the subprime crisis which affected a much smaller part of the world. A recent bibliographic review (Hosseini et al., 2022)

on Covid-19 related studies indicated that large organisations, like the ones of our sample, focused on corporate social responsibility which could be seen as a stability corporate strategy. At the same time, articles like (Sharma et al., 2022) discuss how foresight helped giant organisations like Samsung to avoid disruption.

Implications for practice

This research sheds light on the top managers' perceptions with regards to the external environment and how these are related to different strategic behaviours; as such, it does not deduce 'best practices' on how managers should react in times of crisis. Overall, the results of our research reinforce the view shared in this journal and within the futures and foresight community of academics and practitioners that it is better to be prepared for radical changes in the external environment, ranging from opportunities to crises. Thus, we echo the calls for managers to develop a culture of foresight (Wiener et al., 2018) within their organisations and to make use of the latest advancements in the foresight tools (Wright et al, 2017; 2020) in order to improve the capacity to strategise within environment of crisis (Nathan, 2004).

Conclusions

This research set out to investigate the relationship between perceptions of the environment and strategy, at a time of a major economic crisis created by the subprime crisis. Our findings confirm that the perception of the environmental turbulence affect the corporate strategy of large organisations. Our analysis shows that before the subprime crisis there was not significant variation in the perceptions about environmental turbulence while after the crisis, the managerial perception changed creating variations about the perceived dynamism, uncertainty and complexity. In addition, we have concluded that the economic crisis in the UK, as an extreme event, has been the determining factor for the finding that perceived environmental uncertainty is associated with one grand strategy (retrenchment). Finally, with regards to the strategies adopted post-crisis, these were found to be more proactive and less opportunistic since companies wanted to minimise their exposure to risk.

Overall, our research reinforces the relationship between environment and strategy, advanced the theory by showing what kind of strategies results from the different perceptions of the environmental turbulence. Thus, we call for future research to investigate the processes and practices associated with how the environment affects strategy making and particularly how foresight practices affect this process during crises.

Table 1

GS	2007		2009	
	Freq.	Percent	Freq.	Percent
1	8	9.64	12	16.9
2	27	32.53	34	47.89
3	31	37.35	21	29.58
4	17	20.48	4	5.63
Total	83	100	71	100

Table 2

Variable	2007			2009	
	GS	Mean	Std Dev	Mean	Std Dev
Complex	1	6.91	1.82	6.73	1.45
	2	7.13	1.44	7.66	1.54
	3	7.36	1.35	7.18	1.75
	4	7.52	1.18	7.38	2.29
Dynamic	1	7.21	2.07	6.54	1.27
	2	7.16	1.11	7.20	1.40
	3	7.19	1.63	6.77	2.02
	4	7.71	0.97	6.38	1.70
Uncertain	1	5.56	0.82	6.48	1.20
	2	5.91	1.19	7.04	1.60
	3	5.72	1.51	6.13	2.00
	4	5.44	2.42	5.38	1.38

Table 3 - Strategy measures by cluster 2009.

Cluster	<i>Complex</i>		<i>Dynamic</i>		<i>Uncertain</i>	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
1	8.05	0.83	7.64	0.94	7.57	0.82
2	6.69	1.91	6.25	1.79	5.68	1.81

Table 4 – Multinomial Regression Results 2007

	<i>GS 1 vs 2</i>		<i>GS 3 vs 2</i>		<i>GS 4 vs 2</i>	
	Coef	Std Err	Coef	Std Err	Coef	Std Err
(Intercept)	14.390	(11.210)	-2.350	(9.290)	6.300	(12.770)
comp	-0.746	(2.760)	2.274	(1.990)	4.641	(2.370)
unc	0.748	(2.170)	1.735	(1.730)	-6.252	(2.590)
dyn	-4.460	(2.070)	-3.120	(1.540)	-1.930	(2.100)
comp:unc	-0.503	(0.336)	-0.573	(0.243)	-0.212	(0.225)
comp:dyn	0.429	(0.227)	0.170	(0.177)	-0.405	(0.290)
unc:dyn	0.375	(0.390)	0.325	(0.269)	0.943	(0.360)

Table 5 – Type II Analysis of Deviance 2007

	LR Chisq	Df	Pr(> Chisq)
comp	1.32	3	0.7248
unc	1.83	3	0.6091
dyn	2.38	3	0.4972
comp:unc	7.61	3	0.0549
comp:dyn	11.50	3	0.0093**
unc:dyn	8.22	3	0.0416 *

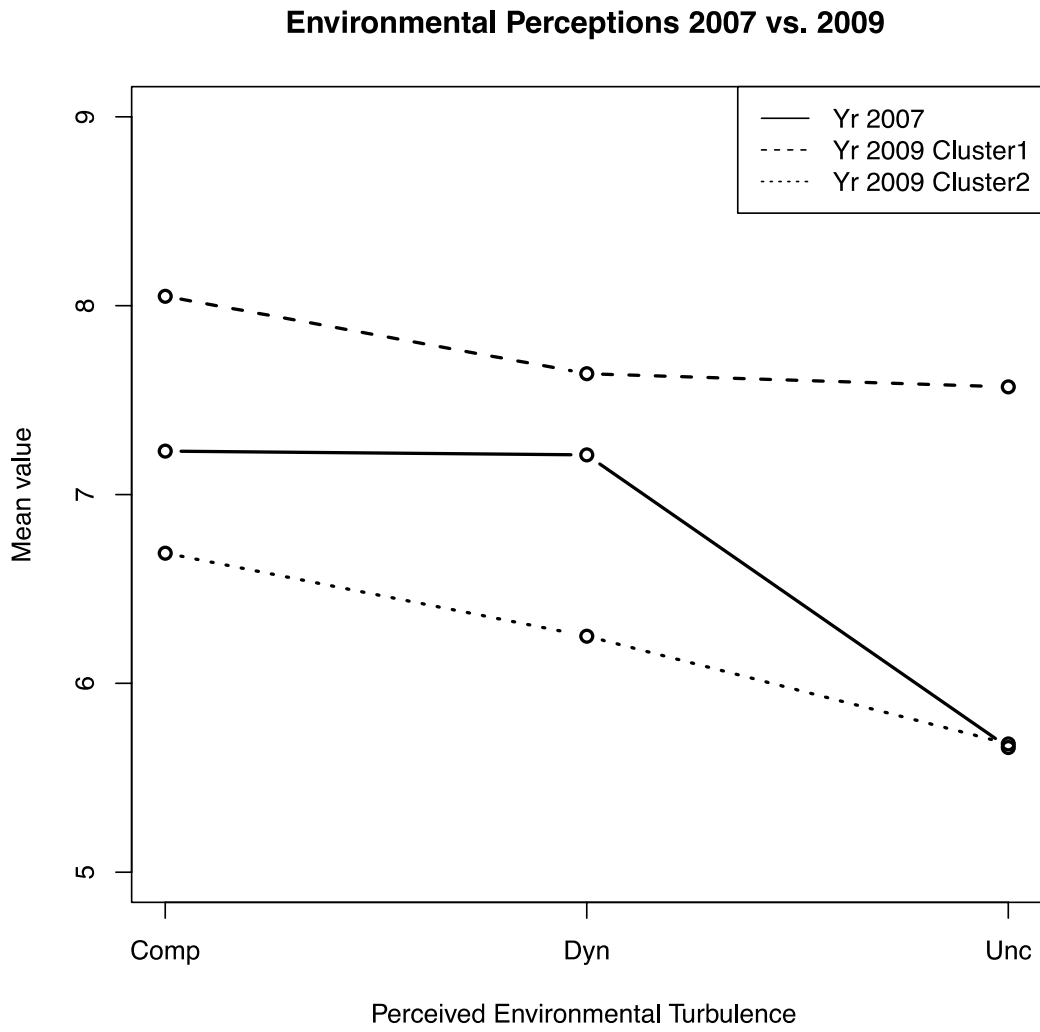
Table 6 - Multinomial Regression Results 2009

	GS 1 vs 2		GS3 vs 2		GS4 vs 2	
	Coef	Std.Err	Coef	Std.Err	Coef	Std.Err
(Intercept)	21.900	(0.956)	75.010	(3.764)	-16.590	(0.999)
comp	9.350	(4.610)	0.160	(3.520)	84.310	(3.590)
unc	2.510	(3.710)	-6.660	(2.050)	0.660	(9.860)
dyn	6.050	(4.730)	2.630	(2.540)	10.550	(2.430)
lrev	-17.620	(7.780)	-14.960	(4.310)	-91.410	(5.540)
dum	-12.440	(2.910)	-15.930	(8.910)	-23.950	(1.830)
comp:unc	-1.200	(0.533)	0.410	(0.311)	-5.590	(2.496)
comp:dyn	-1.510	(0.600)	-0.520	(0.292)	-9.510	(5.909)
unc:dyn	-0.010	(0.348)	-0.660	(0.280)	3.510	(5.685)
comp:lrev	0.940	(0.684)	-0.650	(0.282)	3.560	(4.453)
unc:lrev	0.630	(0.511)	1.340	(0.317)	3.020	(6.776)
dyn:lrev	0.680	(0.460)	1.200	(0.328)	4.380	(1.590)
comp:dum	1.180	(0.836)	6.510	(1.637)	-11.650	(11.012)
unc:dum	0.880	(1.130)	-3.130	(1.580)	-14.310	(2.990)
dyn:dum	-0.950	(1.230)	-5.090	(1.550)	4.010	(9.260)
lrev:dum	0.210	(1.850)	3.580	(1.160)	23.350	(7.560)

Table 7 – Type II Analysis of Deviance 2009

	LR Chisq	Df	Pr(> Chisq)
comp	2.14	3	0.5430
unc	5.11	3	0.1636
dyn	1.47	3	0.6883
lrev	7.33	3	0.0620
clus	5.83	3	0.1204
comp:unc	9.49	3	0.0235*
comp:dyn	14.87	3	0.0019 **
unc:dyn	8.95	3	0.0300*
comp:lrev	8.27	3	0.0408 *
unc:lrev	13.01	3	0.0046**
dyn:lrev	10.33	3	0.0160*
comp:clus	12.09	3	0.0071**
unc:clus	6.99	3	0.0723
dyn:clus	14.82	3	0.0020 **
lrev:clus	8.54	3	0.0361*

Figure 1: Environmental Perceptions 2007 vs. 2009



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