



# Bad weather ahead: Pre-recession characteristics and the severity of recession impact

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## ABSTRACT

This paper addresses a simple question: why are some firms more severely affected by recessions than others? Using the Norwegian financial crisis of 2008 as an empirical setting, I find that firms pursuing pre-recession strategies with a high emphasis on innovation or cost-cutting are less likely to experience reduced demand during the recession. In the other direction, I find that firms pursuing a pre-recession strategy emphasizing quality, firms with high pre-recession growth, firms with many competitors, and firms selling durable goods are more likely to experience reduced demand during the recession. These findings imply that recessionary shocks are not randomly assigned to firms, which is valuable for future research on firm behavior and performance over the business cycle and for managers wishing to analyze the vulnerability of their own firms (or competing firms) to recessions.

## 1. Introduction

When a recession hits, firms face a trade-off between the financial risk of investing and the competitive risks of not investing (Ghemawat, 2009). How firms balance this trade-off is determined, in part, by how severely the firms are affected by the shock. Severely affected firms are likely to focus on survival and prioritize actions with short-term benefits (DeDee & Vorhies, 1998; Mann & Byun, 2017), while less-affected firms might afford to adopt longer-term perspectives and use the recession to acquire underpriced assets, hire cheaper high-quality labor, or capture market share from struggling competitors (Knudsen & Lien, 2015; López-García, Montero, & Moral-Benito, 2013). In other words, to understand how recessions affect firm behavior and, ultimately, competitive outcomes, we need to understand how and why recessionary shocks affect firms differently.

Despite this, remarkably little research has considered how and why different firm and market characteristics make some firms systematically more vulnerable to economic and financial shocks than others. This is surprising, as a widely accepted view in strategy and management research is that changes in the external environment place important contingencies on firms' responses and turnaround strategies (Cameron, Kim, & Whetten, 1987; Park & Mezas, 2005; Trahms, Ndofor, & Sirmon, 2013; Zajac, Kraatz, & Bresser, 2000). Without knowing whether or how recessions affect firms in systematically different ways, we cannot know whether any observed differences in firm responses are the result of managerial discretion or the result of

differences in recession impacts. Similarly, when studying the performance implications of recessions, we cannot determine the unique contribution of firm responses to post-recession performance without controlling for systematic differences in the impact of the shock.

The purpose of this paper is to address this gap in the literature by studying how and why different firm and market characteristics relate to the extent to which firms experience demand reductions in a recession. To develop my hypotheses, I combine insights from strategy and management research with insights from the empirical business cycle literatures in economics, finance and marketing. Using the financial crisis of 2008 and the subsequent recession as the empirical setting, I exploit a unique dataset that combines publicly available financial information with data from an extensive survey about the effects of the shock on 1248 Norwegian firms. To operationalize demand changes, I use two different measures: one based on CEOs' subjective views of how the recession changed the demand for their firms' products or services, and one derived from registry data measuring the percentage change in turnover between the last year before the recession (2007) and the first full accounting year after the beginning of the recession (2009).

The overarching finding from my analyses is that there are, indeed, systematic differences in the severity with which firms were affected by the recession. More specifically, I find that firms pursuing pre-recession strategies with a high emphasis on innovation or cost-cutting were less likely to experience reduced demand during the recession. In the other direction, I find that firms pursuing a pre-recession strategy that emphasized quality, firms with high pre-recession growth, firms in markets

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with many competitors, firms in markets with quality competition, and firms selling durable goods were more likely to experience reduced demand in the recession. I also compare the unique contributions of each of these variables to a firm's demand vulnerability in the event of a recession.

I also find that the analyses using the two different measures of changes in demand yield both consistent and diverging results. When discussing potential explanations for the differences, I argue that the crude measure based on annual accounting data has several disadvantages compared to the measure based on managers' subjective views. For the purpose of this study, I show how the subjective measure of demand reduction better isolates the actual impact of the recessionary shock from firms' responses to it and from all other recession-unrelated factors that affect firm performance in the same period.

The findings of this paper add to the emerging literature on strategic management in recessions (Agarwal, Barney, Foss, & Klein, 2009; Hausman & Johnston, 2014; Lettice, Tschida, & Forstenlechner, 2014; Mann & Byun, 2017; Nason & Patel, 2016) by presenting a set of “stylized facts” concerning how different pre-recession characteristics influence firms' vulnerability to demand problems in a recession. I also show that recessions are not randomly assigned to firms, which highlights the need to control for pre-recession heterogeneity when studying how firms respond to recessions and when studying performance effects of different responses. Finally, my findings have implications for practice, as they can be used by managers who want to analyze the recession risks to their own firms, their competitors, or their customers. The findings can also be used by investors and creditors who want to assess the risks of potential borrowers/investment objects.

## 2. Theory and hypotheses

Business cycles are fluctuations in an economy's income relative to its long-term trend, where booms are income rising above the trend and recessions are income falling below the trend (Hamilton, 1989). Recessions differ in their specific causes, intensities, and durations, but most share some common features. One such feature is reduced demand for firms' products and services (Kaytaz & Gul, 2014; Reinhart & Rogoff, 2009). Changes in demand will affect both firms' investment opportunities and growth prospects (Bernanke, 1983; Ghemawat, 2009) and their ability to finance investments and day-to-day operations (Bhagat & Obreja, 2013; Bond, Harhoff, & Van Reenen, 2005; Ivashina & Scharfstein, 2010).

Recessions, thus, impact factors that are important for firm performance. This suggests that the strategy field, with its focus on understanding variations in performance across firms and industries, should be interested in recessions and business cycle fluctuations. However, this has not been the case, as the strategy literature on the subject of recessions is surprisingly sparse (Agarwal et al., 2009; Garcia-Sanchez, Mesquita, & Vassolo, 2014; Mascarenhas & Aaker, 1989).

Strategy research suggests that firms differ in terms of both *how* they compete and *where* they compete. Firms with different strategies control heterogeneous resources, and the imperfect mobility of resource stocks makes it costly to change a strategy, as this also requires changing the underlying resource stock (Barney, 1991; Peteraf, 1993). The markets in which firms compete differ in their structural characteristics, and these characteristics tend to be relatively stable (Porter, 1980). If certain resources, capabilities, or structural market characteristics make firms more likely to experience demand contractions in recessions, this implies that one broad economic shock should impact firms differently and cause variations in both firm behaviors and competitive outcomes.

The business cycle literatures in economics, finance, and marketing point to several relatively stable firm and market characteristics that may affect the demand conditions faced by a firm during a recession. More specifically, these characteristics can influence demand changes in two overarching ways. The first is through the demand side, where different firm and market characteristics influence the cyclical nature of

market demand. The second is through the supply side, where different firm and market characteristics affect how a firm or a market responds to contractions in demand (e.g. in terms of margins, volume, or the intensity of rivalry). Both effects will influence the demand conditions a firm faces in a recession, although the demand effect will precede the supply effect, and the supply effect will, to some extent, be contingent on the size and nature of the demand effect.

In the following, I pursue this line of reasoning and investigate how a set of central firm and market characteristics in strategy and management affect the likelihood that firms experience reduced demand in a recession. Since the strategy and management literature on the subject of recessions and business cycles is sparse (Agarwal et al., 2009; Garcia-Sanchez et al., 2014), I also draw on the business cycle literatures from economics, finance, and marketing to develop my hypotheses.

### 2.1. Cost strategies and price competition

When a recession hits, customers become more price elastic and less willing to pay for quality (Field & Pagoulatos, 1997). This is reflected in spending patterns over the business cycle, as customers tend to switch to cheaper goods and increase bargain-hunting in recessionary times (Cha, Chintagunta, & Dhar, 2014; Kaytaz & Gul, 2014). Firms with low-cost strategies create value by selling at low prices, meaning that this shift in customer preferences is a good thing, as it leads to an increase in demand for their lower-priced products and services (at the expense of higher-priced competitors). In line with this, Lamey, Deleersnyder, Dekimpe, and Steenkamp (2007) documented that private labels tend to experience countercyclical demand, with customers becoming more likely to switch to private label products, at the expense of more expensive branded products, during recessions.

A similar logic can be extended to markets competing on price. During a recession, a market characterized by price competition is more likely to benefit from its (lower-priced) products and services becoming more attractive in the eyes of increasingly price-sensitive customers (Stiglitz, 1984). In addition, if a market with price competition were to experience a drop in demand, firms might experience this drop less dramatically than other markets dominated by other competitive parameters. To understand how, we can look to the classic competition models of Bertrand and Cournot. In Bertrand competition, there are no capacity constraints, the goods are homogenous, and firms compete on prices, while in Cournot competition, constraints on capacity reduce firms' incentives to lower prices. The main difference between Bertrand and Cournot competition is, thus, capacity constraints (Haskel & Martin, 1994). Kreps and Scheinkman (1983) introduced the idea that the form of competition in a market is endogenous to changes in capacity. That is, if a negative demand shock inflicts excess capacity on a Cournot market, the competition is transformed from Cournot to Bertrand, and price competition intensifies (Haskel & Martin, 1994; Reynolds & Wilson, 2000; Schmidt, 1997; Small, 1997). Firms in markets with Bertrand competition before the recession will not experience this change in competition form, making an equally sized demand shock feel relatively less dramatic.

In sum, the above discussion leads to the following hypotheses:

**H1.** Strategies with a high emphasis on low costs make firms less likely to experience demand reductions in a recession.

**H2.** Being in a market that competes on price makes firms less likely to experience demand reductions in a recession.

### 2.2. Quality strategy and quality competition

Firms with a quality strategy create value by increasing customers' willingness to pay by providing products and services with better performance, higher quality, better design, or better functionality than

competitors. Similarly, in markets characterized by quality competition, such parameters are the most important for winning customers (Besanko, Dranove, Shanley, & Schaefer, 2007).

There are two opposing theoretical arguments concerning the relationships between a quality strategy/quality competition and the likelihood of experiencing reduced demand during a recession. The first argument is the flip-side of the prediction outlined in Section 2.1. When a recession hits, customers become more price sensitive and less willing to pay for quality (Bils, 1987; Field & Pagoulatos, 1997), leading them to flee from higher-priced (and higher-quality) products and services to lower-priced alternatives within the same market or to switch to adjacent markets (Jaimovich, Rebelo, & Wong, 2015; Lamey et al., 2007). In other words, firms with quality strategies are more likely to lose customers to competitors with low-cost strategies, and markets with quality competition are more likely to lose customers to adjacent substitute markets with price competition and lower-priced products and services. This suggests that firms with quality strategies, and firms in markets with quality competition, face greater demand contractions during a recession.

The second theoretical argument is that having a quality strategy and competing on quality increase (vertical) product differentiation. Increased product differentiation leads to higher switching costs for customers and more inelastic demand. When a recession hits, therefore, firms with highly differentiated products may experience less leakage of customers to alternative providers simply because their customers are less price-sensitive (Klemperer, 1995). In theory, the relatively inelastic demand faced by firms with quality strategies and firms that compete on quality may alleviate the demand contractions.

The two theoretical arguments move in opposite directions, but it seems likely that the former effect will dominate. Research on customer behavior and spending patterns in recessions indicate that customers are more likely to gravitate towards lower-priced alternatives or drop out of the market altogether (e.g. Ang, Leong, & Kotler, 2000). That is, the overall negative effect of recessions on consumers' wealth, job security, and expected future income is likely to trump the lock-in effect created by relatively higher switching costs. In addition, it seems more likely that firms selling high-quality products or services, instead, will counter the effects of falling volume by exploiting the inelastic demand of their remaining customers through higher prices (Klemperer, 1995; Martins & Scarpetta, 1999). In sum, the above discussion suggests that firms selling high-quality products or services should experience greater demand contractions in a recession:

**H3.** Strategies with a high emphasis on quality make firms more likely to experience demand reductions in a recession.

**H4.** Being in a market that competes on quality makes firms more likely to experience demand reductions in a recession.

### 2.3. Innovation strategies

Firms with strategies emphasizing innovation create value through the creation of new or the development of existing products and services that fulfill customer needs that are unmet by existing products. There are two main reasons innovative firms should experience less demand reductions in recessions. The first is that investments in R&D and innovation are less sensitive, on average, to fluctuations in aggregate demand. Such investments have a very long time span, in the sense that the long-term prospects of demand are more important for firms' decisions to abandon, cut or increase such investments than temporary fluctuations in demand (Ghemawat, 2009; Knudsen & Lien, 2014). Investments in R&D and innovation also have high adjustment costs. A large share of R&D expenses is related to paying scientists and engineers (Hall, 2010), and much of the output is in the form of tacit knowledge embodied in firms' human capital (Coff, 1997; Hitt, Bierman, Shimizu, & Kochar, 2001). This increases adjustment costs

because, if a firm makes temporary cuts in ongoing R&D investments, much of this valuable knowledge and human capital will be lost and must be "re-accumulated" when demand increases again (Dierickx & Cool, 1989). The combination of long-term demand prospects and high adjustment costs gives firms with innovation strategies incentives to shield investments from short-term aggregate fluctuations in demand (Aghion, Askenazy, Berman, Cetto, & Eymard, 2012) and possibly also to pursue less volatile demand in the first place.

The second reason is that an innovation strategy requires a different set of underlying resources and capabilities than the "ordinary" capabilities focused on maintaining or gradually improving the status quo that underlie a pure cost-and-quality strategy (Winter, 2003). Firms that emphasize innovation rely more on "dynamic" capabilities, or capabilities designed to extend, modify, or create ordinary capabilities (Stadler, Helfat, & Verona, 2013; Teece, Pisano, & Shuen, 1997; Winter, 2003). Research shows that dynamic capabilities are advantageous in rapidly changing environments (Eisenhardt & Martin, 2000; Teece et al., 1997), which implies that firms with a high emphasis on innovation are more able to quickly find alternative revenue streams if demand falls. In line with this, Berchicci, Tucci, and Zazzara (2013) found that R&D-intensive firms were more likely to increase investments in new product innovations in economic downturns.

In sum, the above suggests that, on average, firms with strategies emphasizing innovation target demand that is less likely to experience short-term fluctuations and have greater ability to quickly counteract falling demand with new revenue streams if needed. This leads to the following hypothesis:

**H5.** Strategies with a high emphasis on innovation make firms less likely to experience demand reductions in a recession.

### 2.4. Firm size

Large firms have more financial reserves, more liquid assets, and better access to external financing than smaller firms. However, larger firms are also less flexible, which can be a weakness when the external environment changes. When demand uncertainty increases, which it tends to do in a recession, investments become more unresponsive, especially for firms that cannot easily reverse their investment decisions (Bloom, Bond, & Van Reenen, 2007). The latter should be the case for larger firms, as even relatively minor changes in operations can be costly (and difficult to reverse) when implemented in a large organization. Furthermore, larger firms with many customers may have weaker incentives to cut prices to counteract demand contractions, as this implies also reducing margins on all existing customers. Finally, the better access to financing for larger firms means that they have a greater ability to "wait and see what happens" before initiating any drastic and difficult-to-reverse measures. All this suggests that larger firms have both stronger *incentives* to wait (and "allow" demand to fall deeper) before implementing any drastic changes and a better *ability* to do so. Put differently, larger firms are expected to face larger demand reductions because they are less likely to quickly adapt to the environmental changes. In line with this, studies from the small business field find that smaller firms are less affected by recessionary shocks than larger firms (Bumgardner, Buehlmann, Schuler, & Crissey, 2011; Varum & Rocha, 2013). For the above reasons, I suggest the following hypothesis:

**H6.** Large firms are more likely to experience demand reductions in a recession.

### 2.5. Firm age

The mortality of younger firms is considerably higher than that for older firms. Within the average cohort, 50 to 60% of all new firms will exit within their first five years (Geroski, 1995). Younger firms have

smaller financial reserves, less established product lines, and a shorter record of accomplishment, making them less eligible for credit. When a recession hits, creditors enter “flight to quality mode” (Bernanke, 1983; Gertler & Gilchrist, 1994; Lang & Nakamura, 1995), preferring firms with strong balance sheets, easily liquidated assets, and low information asymmetry problems. This tends to disfavor young firms. Customers and suppliers may also “punish” young firms for the same reasons, especially because younger firms tend to have less loyal customer bases. This, in combination with less access to finance, means that younger firms should experience both sharper drops in demand and a lower ability to finance responses to counter the falling demand:

**H7.** Younger firms are more likely to experience demand reductions in a recession.

## 2.6. Pre-recession growth

High pre-recession growth may imply that a firm was “doing something right,” but it may also imply that a firm has a high share of marginal customers that entered in the boom. The latter could be either because the firm has captured many customers from competitors or because it competes in a market with highly cyclical products or services, in which many new customers joined in the later stages of the boom (Geroski & Gregg, 1997). In any case, the higher share of marginal customers of high-growth firms makes them more vulnerable to changes in customer preferences. If a firm has earned its growth by capturing customers from competitors, these customers have proven that they are disloyal, and may be more inclined to leave for better options elsewhere when a recession induces them to increase comparisons of offers (Ang et al., 2000). Furthermore, high growth may come at the expense of building a robust organization and increasing financial solidity, which may hamper high-growth firms' ability to provide competitive offers to customers in a recession. If the high pre-recession growth comes from competing in a highly cyclical market, the customers that enter late in the boom are also likely to be the first to leave when the good times end (Field & Pagoulatos, 1997). That is, firms in markets with high pre-recession growth are more likely to experience considerable drops in demand. In line with the above, Geroski and Gregg (1997) found that firms with relatively higher pre-recession growth were more severely affected in the UK recession in the early 1990s. In sum, this suggests the following hypotheses:

**H8.** Firms with high pre-recession growth are more likely to experience demand reductions in a recession.

**H9.** Being in a market with high pre-recession growth makes firms more likely to experience demand reductions in a recession.

## 2.7. Durability of products

A robust finding in the economics literature is that durable goods industries are far more cyclical than industries selling non-durable goods. Petersen and Strongin (1996) suggested several explanations for this observation. One explanation is that small changes in customers' desired stock of durable goods lead to large percentage changes in the demand for such products, while another is that durable goods purchases often rely on external financing, which may be more difficult for customers to obtain during recessions. A third explanation is that there is an option value for customers associated with avoiding irreversible actions under uncertainty (Bernanke, 1983). Investments in durable goods involve some irreversibility, so the value of the delay option increases during recessions, magnifying the negative drop in demand (Petersen & Strongin, 1996). While the abovementioned research is conducted on an industry level, it seems likely that the mechanisms are transferrable to the firm level and that firms with a high share of durable goods in their product mix should experience greater contractions

in demand during recessions:

**H10.** A high share of durable goods makes firms more likely to experience demand reductions in a recession.

## 2.8. Number of competitors

I will use a stylized example to illustrate how the number of competitors in a market relates to the extent that a firm will experience greater or weaker demand contractions in a recession. Consider a market that is split 50/50 between two competitors. When a recession hits, many customers drop out of the market, and those that remain become more price sensitive and more likely to bargain hunt. In general, such demand contractions will increase each of the two firms' incentives to cut prices in an effort to capture volume from the other (Bhaskar, Machin, & Reid, 1991). As there are only two firms in this market, there is a 50% chance that each of the two firms will be the actor that manages to steal customers from its competitor and alleviate the demand contractions. Furthermore, markets with very few actors are also more likely to engage in (implicit) collusive behavior on price or capacity adjustments, which could counter the negative effects of demand contractions by improving margins (Field & Pagoulatos, 1997; Martins & Scarpetta, 1999; Rotemberg & Woodford, 1991).

Next, assume a fragmented market that is evenly split among 20 competitors. The likelihood that each of these firms is the actor (or among the actors) that succeeds in capturing customers from rivals and counteracting the general demand contractions is only 1/20, or 5%. If we add that a higher number of competitors makes it less likely for firms to manage to coordinate prices or capacity adjustments, this suggests that it becomes more difficult to compensate for falling volumes by improving margins (Field & Pagoulatos, 1997). In sum, this means that a firm in a market with many competitors is more likely to experience greater demand contractions when a recession hits:

**H11.** Having many close competitors makes a firm more likely to experience demand reductions in a recession.

## 3. Data and methods

To study the proposed relationships, I combine publicly available financial information with data from an original survey about the effects of the recent financial crisis and the subsequent recession on Norwegian firms, collected in the fall of 2010. The sample frame consisted of the entire population of Norwegian firms, with several restrictions to improve its generalizability. I required firms to have a turnover larger than NOK 10 million (\$1.7 million) and salary expenses of a minimum of NOK 3 million (\$0.5 million) to prevent small firms without any real operations from dominating the sample. I also removed all government-owned firms and firms from 14 two-digit NACE industries I believed would disturb the generality of the sample (banking, insurance, agriculture, health, and culture). This resulted in a sample frame of 17,312 firms, from which I randomly sampled 5000 firms to receive the survey. The survey was addressed to the CEOs, and a total of 1248 firms responded (25% response rate). To check for respondent biases, I used registry data to compare the 5000 firms that received the survey with the non-responding firms on such variables as size, profitability, debt ratio, and age and could find no statistically significant differences between the two groups. In addition, I conducted a visual inspection of such categorical variables as ownership type, industry membership, and geography without uncovering any apparent differences. Missing survey or accounting data reduced the effective sample to approximately 1100 usable responses.

### 3.1. Dependent variables

I created two dependent variables measuring the severity of the



recession, one derived from survey data and one derived from accounting data. *Demand reduction (survey)* is based on a single, seven-point scale item from the survey capturing the CEO's subjective views concerning how the crisis affected the demand for the firms' products and services. The scale ranges from  $-3$  (reduced) to  $+3$  (increased), with 0 indicating no change. I recoded the scale to 1 to 7 and reversed it so that a higher value would reflect a larger reduction in demand. That is, in the analysis, 1 equals a large increase in demand, 4 equals no change in demand, and 7 equals a large contraction in demand.

*Demand reduction (registry)* is measured as the percentage growth in sales income between 2007 (the last full accounting year before the recession) and 2009 (the first full accounting year after the beginning of the recession). I multiplied this measure by  $-1$ , such that a higher number reflects a larger reduction in demand. This registry-based measure of demand reductions follows a common method of measuring the impact of economic shocks: that is, to first define a start (and an end) of an economic downturn before comparing changes in performance measures before, during, and after the downturn. It also follows the classic definition of organizational decline (Cameron et al., 1987; McKinley, Latham, & Braun, 2014), in the sense that it measures decline over a two-year period.

Table 1 shows the descriptive statistics of the dependent variables.

### 3.2. Independent and control variables

I created 11 independent variables to capture different pre-recession firm and market characteristics (see Appendix A for detailed descriptions of all the variables). Starting with the firm-level variables, *cost strategy*, *quality strategy*, and *innovation strategy* are based on one, two, and four items, respectively, from the following survey question: "How important was the following for your firm in the competition with its closest competitors before the recession?" *Cost strategy* is based on the item "reduce operating costs." The scale ranges from 1 to 7, with a high number indicating a greater focus on low costs. *Quality strategy* is based on the items i) high customer service and ii) a high quality of products/services. The scale ranges from 2 to 14 (1 to 7 per item), with a high number indicating a higher focus on quality. *Innovation strategy* is based on the items i) innovation/R&D, ii) implementing new solutions (technologies, systems), iii) further developing existing products/services, and iv) launching new products and services. The scale ranges from 4 to 28 (1 to 7 per item), with a high number indicating a higher focus on innovation. *Durable goods share* is the self-reported pre-recession share of durable goods in the firms' product mix. *Firm size* is measured as the natural logarithm of turnover in 2007, *firm age* is measured as the natural logarithm of firm age in 2008, and *firm growth* is measured as sales growth between 2006 and 2007.<sup>1</sup> The former four variables were derived from the survey data, while the latter three were derived from secondary accounting information.

Moving on to the market-level variables, *price competition* is based on a 7-point scale item in which the firms evaluated the degree of price competition in their main market before the recession. *Quality competition* is constructed by summing up four 7-point items related to customers' needs, customers' willingness to pay, product prices, and the number of product variants in a firm's main market before the recession. The scale ranges from 4 to 28, with a high number indicating that products are vertically differentiated (e.g. that firms compete on quality). *Market growth* is the self-reported yearly growth in a firm's

<sup>1</sup> I removed six firms from the sample that were extreme outliers on the sales growth variable ( $> 500\%$  growth from 2006 to 2007), as these observations were more likely to represent extraordinary events than "normal" sales growth. As a robustness check, I performed all analyses both with and without these cases, and the only difference between the models was that the sales growth variable became significant when I removed the extreme outliers. I, therefore, decided to report the analysis without these extreme outliers.

**Table 1**  
Descriptive statistics of the dependent variables.

	Demand reductions (survey)		Demand reductions (registry)	
	Frequency	Percent		
1 Large increase in demand	34	2.7	Valid	1224
2	29	2.3	Missing	24
3	43	3.4		
4 No change in demand	299	24.0	Mean	$-0.010$
5	313	25.1	Median	0.007
6	290	23.2	Std. deviation	0.402
7 Large reduction in demand	220	17.6		
Missing values	20	1.6	Minimum	$-3.72$
Total	1248	100.0	Maximum	1.00

main market before the recession, with respondents choosing from seven categories ranging from  $< -5\%$  to  $> 25\%$ . Finally, *Competitors* is measured as the natural logarithm of firms' self-reported number of close competitors before the recession.

I also include a set of control variables. *Entry rate* is based on a single 7-point item concerning the frequency with which new firms entered the main market before the recession. *Export intensity* is the self-reported share of sales to customers outside of Norway and is included to control for the fact that firms exporting to more severely affected economies are more likely to experience problems. *Firm profits* and *debt* are measured as the operating profits (2007) and debt-to-total assets (2007) and are included to control for unobserved firm-level characteristics expected to work through these variables. Finally, I include a set of industry dummies (two-digit NACE codes) to control for unobserved variations stemming from industry affiliations, such as differences in the dynamism, munificence, and cost structures of different industries. The means, standard deviations and correlations of the independent and control variables are shown in Table 2.

### 3.3. Data concerns

Survey data are susceptible to several potential biases. One is the aforementioned response bias. Another is that surveys are retrospective, implying issues related to the accuracy of respondents' memories. I tried to minimize such memory biases by distributing the survey relatively soon after the recession. A third concern is single respondent/common method bias, which is problematic if responses are subject to systematic biases, such as the surveyed CEOs blaming poor performance on the recession. However, as I also included a registry-based measure of severity, and because there are no strong norms for what a "socially desirable" answer should be to most of the questions in this survey, I believe this problem is insignificant. Finally, the data are also vulnerable to survivor bias, as I only distributed the survey to firms that were still operating in the fall of 2010. The most vulnerable and adversely hit firms are, therefore, underrepresented in my data.<sup>2</sup>

## 4. Findings

I used OLS regressions to investigate the relationships between firm and market characteristics and changes in demand created by the recession.<sup>3</sup> The regression outputs are presented in Tables 3 and 4, and the basic model is shown in Eq. (1), where  $Y_{1-2}$  represents the two

<sup>2</sup> Of the initial population of firms (constructed based on 2007 numbers), 6.6% were bankrupt or had been deleted from public registers for other reasons at the time the survey was distributed.

<sup>3</sup> As robustness checks, I also ran the models using bootstrapped standard errors and OLS with robust standard errors. Both these exercises yielded results consistent with the results produced by the OLS regressions reported here.

**Table 2**  
Means, standard deviations and correlation coefficients of independent- and control variables.

	Mean	Std. dev.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1 Innovation strategy	17.74	4.86	1														
2 Cost strategy	4.62	1.51	0.3129	1													
3 Quality strategy	11.59	2.12	0.3161	0.2020	1												
4 Age <sup>a</sup>	15.99	13.18	0.0245	0.0002	0.0265	1											
5 Size <sup>a</sup>	112.544	428,067.00	0.0303	0.0350	-0.0799	0.1554	1										
6 Competitors <sup>a</sup>	12.70	51.78	-0.0208	0.0186	-0.0389	0.0121	0.0247	1									
7 Price competition	4.69	1.54	0.0914	0.2538	0.1214	0.0386	0.1202	0.1195	1								
8 Quality competition	16.57	4.92	0.0729	0.0612	0.1702	0.0550	-0.0264	0.2327	0.2141	1							
9 Durable goods share	47.60	44.83	0.0664	-0.0427	-0.0014	0.1285	0.1365	-0.0837	-0.0093	0.0596	1						
10 Industry growth	4.73	1.34	0.0082	-0.1363	0.0617	-0.1524	-0.0324	-0.0007	-0.1642	-0.0031	0.0072	1					
11 Entry rate	2.87	0.94	-0.0155	-0.1456	-0.0591	-0.0879	-0.0283	0.1787	-0.0212	0.1821	-0.0560	0.1891	1				
12 Export intensity	8.42	21.46	-0.0162	0.0067	-0.0820	-0.0143	0.2221	0.0022	0.0137	-0.0286	0.0083	0.0405	-0.0570	1			
13 Debt (2007)	0.73	0.25	-0.0665	0.0290	-0.0625	-0.1290	-0.0237	0.0272	-0.0260	0.0009	-0.0907	0.0289	0.0131	-0.0562	1		
14 Profits (2007)	0.07	0.12	-0.0001	-0.0335	0.0792	-0.0427	0.0146	0.0133	-0.0649	-0.0508	-0.0041	0.0628	0.0064	-0.1521	-0.1929	1	
15 Firm growth (2006–07)	0.27	0.52	-0.0087	-0.0233	-0.0392	-0.2229	0.0044	0.0905	-0.0142	0.0533	-0.0352	0.1069	0.0857	0.0270	0.0829	0.0514	1

<sup>a</sup> Mean and standard deviations calculated without taking the natural logarithm of the variables.

dependent variables.

$Y_{1-2}$

$$= \alpha + \beta_1 \text{ Cost strategy} + \beta_2 \text{ Price competition} + \beta_3 \text{ Quality strategy} + \beta_4 \text{ Quality competition} + \beta_5 \text{ Innovation strategy} + \beta_6 \text{ Size} + \beta_7 \text{ Age} + \beta_8 \text{ Firm growth} + \beta_9 \text{ Market growth} + \beta_{10} \text{ Durable goods} + \beta_{11} \text{ Competitors} + \beta_{12} - \beta_{15} \text{ Controls} + \epsilon \quad (1)$$

I ran five models for each of the two dependent variables *demand reduction (survey)* (Model S1–S5) and *demand reductions (Registry)* (Model R1–R5). Models S1/R1 consist of the control variables and a constant, Models S2/R2 consist of the controls and the firm-level variables, Models S3/R3 consist of controls and market-level variables, and Models S4/R4 include the full specifications. Models R5/S5 test the non-linearity of the *market growth* variable for the registry-based DV (details in Section 4.2). All models are statistically significant at the 0.01 level.

#### 4.1. Survey-based measure of changes in demand

Table 3 shows the results of the models using the survey-based measure of demand changes, where Model S4 is the full specification. From this, we see that *innovation strategy* ( $P < 0.01$ ) and *cost strategy* ( $p < 0.01$ ) are associated with smaller demand contractions in the recession, while *quality strategy* ( $p < 0.01$ ), *firm size* ( $p < 0.05$ ), *firm growth* ( $p < 0.01$ ), *durable goods share* ( $p < 0.01$ ), number of *competitors* ( $p < 0.01$ ), *quality competition* ( $p < 0.1$ ), and *market growth* ( $p < 0.01$ ) are associated with more demand contractions. In addition, though the two variables *age* and *price-competition* had the predicted negative signs, they were not statistically significant. We do, however, see that *price competition* is negative and significant ( $p < 0.05$ ) in Model S3, which includes only the market-level variables. While this offers some support for H2, the non-significant results in the full specification (Model S4) make it difficult to conclude that H2 is supported.

In sum, these results offer support for hypotheses H1, H3 through H6, and H8 through H11. The data did not support H2 (*price competition*) or H7 (*firm age*).

#### 4.2. Registry-based measure of changes in demand

Table 4 shows the results of the models using the registry-based measure of demand changes, where Model R4 is the full specification. From the table, we can see that *innovation strategy* ( $P < 0.01$ ) and *market growth* ( $p < 0.01$ ) are associated with smaller demand contractions in the recession, while *age* ( $p < 0.05$ ), *durable goods share* ( $p < 0.01$ ) and *quality competition* ( $p < 0.01$ ) are associated with more demand contractions.

These results thus offer support for H4 (quality competition), H5 (innovation strategy), and H10 (durable goods), but not for hypotheses H1 (low cost strategy), H2 (price competition), H3 (quality strategy), H6 (size), H8 (firm growth), and H11 (competitors). In addition, the signs of the two variables age and market growth were found to be negatively associated with demand contractions. This is surprising, as the hypotheses predicted the opposite, and the model with the survey-based dependent variable found a positive relationship between demand contractions and pre-recession market growth. In the following, I discuss potential explanations for these seemingly contradictory results.

Starting with the firm age variable, three possible explanations emerge.<sup>4</sup> The first is that the result is driven by a selection bias

<sup>4</sup> Note that I also tested for non-linear effects (both squared and cubic), removed/added other variables, and interacted age with such variables as high growth, entry rates, size, etc. None of these exercises yielded any fruitful

**Table 3**  
OLS Regression output using the survey-based measure of demand reductions.

Dependent variable	Demand reduction (survey)									
	(S1)		(S2)		(S3)		(S4)		(S5)	
	Coef.	Beta	Coef.	Beta	Coef.	Beta	Coef.	Beta	Coef.	Beta
Firm variables										
Innovation strategy			−0.029*** (0.009)	−0.098***			−0.035*** (0.009)	−0.122***	−0.035*** (0.009)	−0.122***
Cost strategy			−0.083*** (0.029)	−0.090***			−0.082*** (0.030)	−0.089***	−0.082*** (0.030)	−0.088***
Quality strategy			0.067*** (0.021)	0.100***			0.057*** (0.022)	0.082***	0.057*** (0.022)	0.082***
Age			−0.003 (0.056)	−0.001			−0.008 (0.057)	−0.004	−0.009 (0.058)	−0.005
Size			0.090** (0.041)	0.070**			0.101** (0.042)	0.077**	0.101** (0.042)	0.077**
Firm growth (2006–07)			0.242*** (0.076)	0.093***			0.217*** (0.076)	0.084***	0.209*** (0.077)	0.081***
Durable goods share			0.003*** (0.001)	0.107***			0.004*** (0.001)	0.123***	0.004*** (0.001)	0.124***
Market variables										
Competitors					0.165*** (0.045)	0.111***	0.158*** (0.045)	0.107***	0.160*** (0.046)	0.108***
Price competition					−0.063** (0.027)	−0.069**	−0.041 (0.028)	−0.045	−0.041 (0.028)	−0.045
Quality competition					0.015* (0.009)	0.053*	0.015* (0.009)	0.053*	0.015* (0.009)	0.053*
Market growth					0.096*** (0.031)	0.092***	0.082*** (0.032)	0.079***	−0.001 (0.124)	−0.001
Market growth <sup>2</sup>									0.010 (0.015)	0.084
Control variables										
Entry rate	0.186*** (0.042)	0.125***	0.151*** (0.043)	0.102***	0.092** (0.044)	0.062**	0.067 (0.045)	0.045	0.064 (0.045)	0.044
Export intensity	0.004* (0.002)	0.059*	0.002 (0.002)	0.024	0.004* (0.002)	0.055*	0.002 (0.002)	0.024	0.002 (0.002)	0.024
Debt (2007)	−0.048 (0.162)	−0.009	−0.079 (0.165)	−0.014	−0.146 (0.161)	−0.027	−0.180 (0.164)	−0.033	−0.176 (0.164)	−0.033
Profits (2007)	−0.169 (0.334)	−0.015	−0.433 (0.366)	−0.035	−0.243 (0.336)	−0.022	−0.406 (0.367)	−0.034	−0.401 (0.368)	−0.033
Constant	2.759*** (0.399)		2.149*** (0.636)		1.860*** (0.489)		1.303* (0.718)		1.442* (0.746)	
Industry dummies		Yes		Yes		Yes		Yes		Yes
Observations		1209		1115		1127		1050		1050
F-value		4.637		4.886		5.117		5.186		5.096
R <sup>2</sup>		0.143		0.184		0.179		0.216		0.217
Adjusted R <sup>2</sup>		0.112		0.146		0.144		0.175		0.174

Standard errors in parentheses.

\*\*\* p < 0.01.

\*\* p < 0.05.

\* p < 0.1.

associated with my sample cut-off limit of 10 M NOK in sales and 3M NOK in salaries and social expenses. This cut-off excludes a large chunk of the smallest firms, which are often also young and newly started. It is, therefore, plausible that the youngest firms in my sample are likely to be either very successful or relatively big (and possibly diversified) upstarts, making them less likely to be representative of young firms in general. The second possible explanation is that the results are driven by a survivor bias in the data. As previously mentioned, I only distributed the survey to firms that were operating in 2010, implying an underrepresentation of the young firms that struggled the most during the recession. Although the survivor bias in this dataset is relatively small, it could be more influential for the smallest firms, since these have a higher mortality. A third explanation may simply be that younger firms are less vulnerable to demand contractions in recessions than older firms. It is, unfortunately, impossible to say which of the

explanations are most valid with the data I currently have available.

Moving on to the *market growth* variable, one potential explanation could be that the *demand reductions (registry)* measure is so crude that it captures some of the “pre-recession growth.” Recall that I measure *demand reduction (registry)* as the percentage change in sales between 2007 and 2009, which implicitly assumes that all firms were affected by the shock in 2008. However, firms were affected by the shock at very different points in time (more on that in Section 4.3). Therefore, if a market had high growth in 2008 and was not affected by the recession before, for example, mid-2009, a measure of the difference in sales income between 2007 and 2009 would be contaminated by this late growth. Moreover, the higher a market's pre-recession growth, the more likely the *demand reductions (registry)* variable is to directly capture some of this pre-recession growth. If this suspicion is true, we should expect *market growth* to be positively related to *demand reductions (registry)* to the point that the pre-recession growth is so high that some of it is captured by the dependent variable and the relationship turns negative. In other words, the relationship between *market growth* and

(footnote continued)  
explanations.

**Table 4**  
OLS Regression output using the registry-based measure of demand reductions.

Demand reduction (registry)										
	(R1)		(R2)		(R3)		(R4)		(R5)	
	Coef.	Beta	Coef.	Beta	Coef.	Beta	Coef.	Beta	Coef.	Beta
Firm variables										
Innovation strategy			−0.005 <sup>*</sup>	−0.063 <sup>*</sup>			−0.007 <sup>***</sup>	−0.090 <sup>***</sup>	−0.007 <sup>***</sup>	−0.090 <sup>***</sup>
			(0.003)				(0.003)		(0.003)	
Cost strategy			0.003	0.011			−0.001	−0.005	−0.002	−0.007
			(0.008)				(0.009)		(0.009)	
Quality strategy			−0.002	−0.011			−0.001	−0.006	−0.001	−0.006
			(0.006)				(0.006)		(0.006)	
Age			0.046 <sup>***</sup>	0.089 <sup>***</sup>			0.035 <sup>**</sup>	0.067 <sup>**</sup>	0.036 <sup>**</sup>	0.069 <sup>**</sup>
			(0.016)				(0.017)		(0.017)	
Size			0.006	0.016			0.007	0.020	0.007	0.020
			(0.012)				(0.012)		(0.012)	
Firm growth (2006–07)			0.003	0.004			0.000	0.000	0.008	0.011
			(0.022)				(0.022)		(0.022)	
Durable goods share			0.001 <sup>***</sup>	0.115 <sup>***</sup>			0.001 <sup>***</sup>	0.101 <sup>***</sup>	0.001 <sup>***</sup>	0.099 <sup>***</sup>
			(0.000)				(0.000)		(0.000)	
Market variables										
Competitors					0.019	0.045	0.008	0.019	0.007	0.017
					(0.013)		(0.013)		(0.013)	
Price competition					−0.009	−0.035	−0.002	−0.010	−0.002	−0.010
					(0.008)		(0.008)		(0.008)	
Quality competition					0.008 <sup>***</sup>	0.104 <sup>***</sup>	0.010 <sup>***</sup>	0.127 <sup>***</sup>	0.010 <sup>***</sup>	0.125 <sup>***</sup>
					(0.003)		(0.003)		(0.003)	
Market growth					−0.036 <sup>***</sup>	−0.121 <sup>***</sup>	−0.030 <sup>***</sup>	−0.103 <sup>***</sup>	0.040	0.139
					(0.009)		(0.009)		(0.036)	
Market growth <sup>2</sup>									−0.009 <sup>**</sup>	−0.253 <sup>**</sup>
									(0.004)	
Controls										
Entry rate	0.025 <sup>**</sup>	0.057 <sup>**</sup>	0.018	0.043	0.016	0.037	0.008	0.020	0.010	0.025
	(0.012)		(0.012)		(0.013)		(0.013)		(0.013)	
Export intensity	0.001	0.049	0.000	0.009	0.001	0.055	0.000	0.026	0.000	0.026
	(0.001)		(0.001)		(0.001)		(0.001)		(0.001)	
Debt (2007)	0.026	0.017	0.063	0.042	0.052	0.033	0.054	0.037	0.051	0.034
	(0.047)		(0.047)		(0.048)		(0.047)		(0.047)	
Profits (2007)	0.076	0.023	0.170	0.051	0.137	0.043	0.188 <sup>*</sup>	0.057 <sup>*</sup>	0.183 <sup>*</sup>	0.055 <sup>*</sup>
	(0.098)		(0.105)		(0.101)		(0.106)		(0.106)	
Constant	−0.225 <sup>*</sup>		−0.322 <sup>*</sup>		−0.268 <sup>*</sup>		−0.363 <sup>*</sup>		−0.479 <sup>**</sup>	
	(0.118)		(0.182)		(0.146)		(0.207)		(0.214)	
Industry dummies	YES		YES		YES		YES		YES	
Observations	1221		1120		1133		1.053		1.053	
F-value	2.662		2.795		3.110		3.199		3.224	
R <sup>2</sup>	0.087		0.113		0.116		0.145		0.149	
Adjusted R <sup>2</sup>	0.054		0.073		0.079		0.100		0.102	

Standard errors in parentheses.

\*\*\* p < 0.01.

\*\* p < 0.05.

\* p < 0.1.

*demand reductions (registry)* should be of the form  $\beta_1 X - \beta_2 X^2$ . To test this, I included a squared term of *market growth* to the full specifications of the model (Models R5 and S5). If true, we should expect that including the squared term in Model R5 (*demand reductions (registry)*) will increase the adjusted R<sup>2</sup> compared to Model R4 and that the coefficient of the squared term will be negative and significant, while the first order term will be positive. Further, we should expect the second order term to not have any significant relationship with the *demand reductions (survey)* (Model S5), a measure that does not have the same problems because it allows the CEOs themselves to implicitly “separate” the effects of the recession from the pre-recession growth. When running the analyses, I found that the second-order term was negative and significant (p < 0.05) in the specification using *demand reductions (registry)* (Model R5), that the first order term was positive, and that including the term increased the adjusted R<sup>2</sup> from 0.0998 to 0.1010. Further, the second order term was non-significant for *demand reductions (survey)*, nor did its inclusion improve the explained variance of the model (Model S5). This indicates that pre-recession *market growth* is

associated with more demand contractions during a recession, which supports H9.

#### 4.3. Relative effect sizes and differences between the model specifications

Figs. 1 and 2 show the standardized coefficients of the independent and control variables from Models S4 and R4 and make it possible to compare the relative effect sizes of the different variables. The standardized coefficients can be interpreted as indicating the number of standard deviations the dependent variable will change given a one standard deviation increase in the independent variables. From Fig. 1, we see that *durable goods share*, *innovation strategy*, *competitors*, *cost strategy*, *firm and market growth*, and *quality strategy* are the most influential variables in Model S4 using the survey-based measure, while *quality competition*, *market growth*, *durable goods share*, and *innovation strategy* are the most influential variables in Model R4 using the registry-based measure of decline.

A comparison of the models using the survey- and registry-based



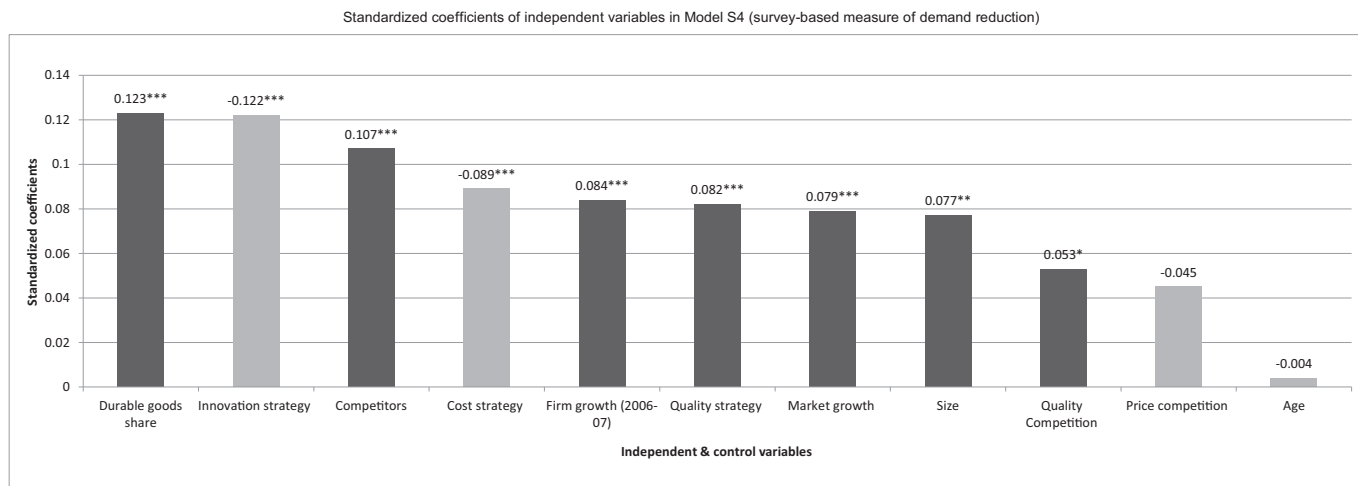


Fig. 1. Standardized coefficients of independent variables in Model S4 (survey-based measure of demand reduction)

<sup>a</sup>The color of the columns represent the sign of the coefficient: Black = increases demand reductions, light grey = reduces demand reductions.

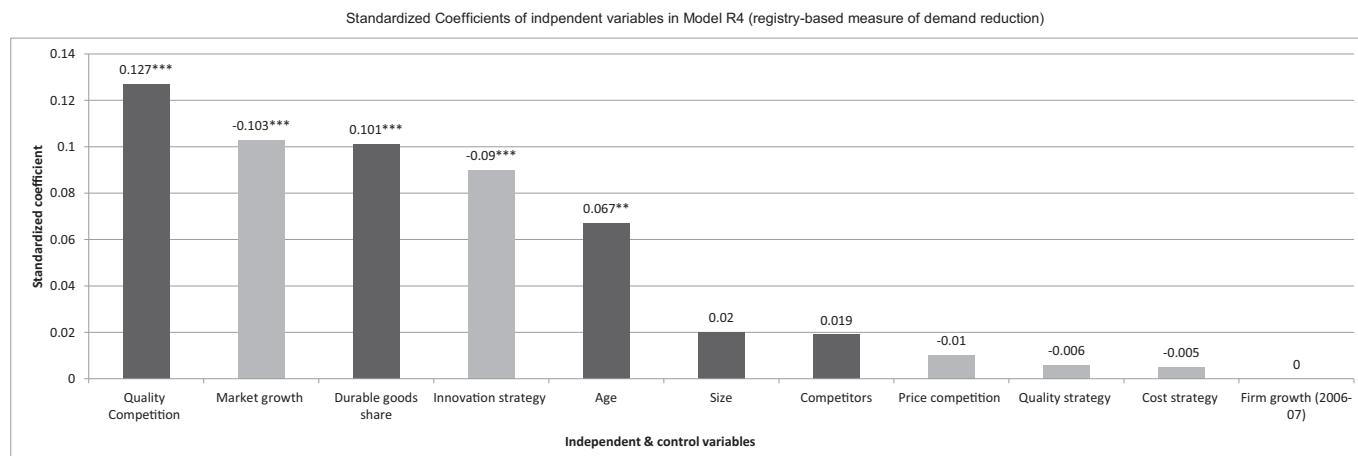


Fig. 2. Standardized Coefficients of independent variables in Model R4 (registry-based measure of demand reduction)

<sup>a</sup>The color of the columns represent the sign of the coefficient: Black = increases demand reductions, light grey = reduces demand reductions

<sup>b</sup>Note that *Market growth* is a squared function on the form  $BX-BX^2$  (cfr. Model R5), which implies that the negatively signed coefficient of *market growth* reported above is misleading as industry growth actually increases firms vulnerability to demand shocks. Please see discussion related to the variable *market growth* in Section 4.2 for further details.

measures of demand contractions reveals both converging and diverging results. For the former, the signs of the coefficients were largely consistent, as were the relative effect sizes of such variables as *durable goods*, *market growth*, and *innovation strategy*, which are among the most influential variables in both models. In terms of differences, we see that Model S4 has a considerably higher adjusted  $R^2$  than Model R4 (0.18 vs. 0.10) and that Model S4 has a higher number of significant coefficients than Model R4 (9 vs. 6). Further, we see that, for several variables, the effect sizes differ between the two models. For example, the variables *competitors* and *firm growth* are very influential in Model S4 (survey-based dependent variable), while they are minimally influential (and insignificant) in Model R4 (registry-based dependent variable). I find similar differences for *size*, *age*, *cost strategy*, and *quality strategy*. This big question, then, is what should we make of this?

I believe that many of these differences arise because the registry-based measure is too crude to capture changes in demand caused by the recession. Overall, this measure has at least two potentially problematic aspects. The first is that the measure does not adequately separate the impact of the shock from firms' responses to it *and* from all other non-recession related factors that affected turnover between 2007 and 2009. To illustrate, consider a firm with identical sales income in 2007 (before

the recession) and 2009 (during the recession). The immediate interpretation would be that this firm was unaffected by the recession. However, we would observe the same result if i) the firm was severely affected by the crisis, but responded in a way that nullified the negative effect or ii) the firm was positively affected by the recession, but failed to take advantage of new opportunities. The second weakness with the registry-based measure is that it implicitly assumes that a recession hits all firms at the same time. To illustrate the problem with this assumption, I asked the respondents when the recession first affected their firm. From Table 5, we see that the start of the recession varied considerably among the firms: 35.4% were first affected in 2008, 35.6% were first affected in 2009, and nearly 11% were not affected before 2010. By the time the data collection was finished (January 2011), approximately 17% of the firms had not yet experienced any effects. The registry-based measure does not capture these differences.

In contrast, the survey-based measure allowed the CEOs themselves to (implicitly) define the start, the effects, and the severity of the shock. This has several advantages over the registry-based measure. First, it makes intuitive sense because research on managerial cognition indicates that managers' subjective perception of a decline is an important determinant in how the firm responded to it (Trahms et al., 2013).

**Table 5**

Start of the recession. Table shows the frequencies of CEO answers to the following question from the survey: “When was your firm first affected by the recession”.

	Frequency	Percent
Spring 08	99	7.9
Fall 08	343	27.5
Spring 09	282	22.6
Fall 09	161	12.9
Spring 10	103	8.3
Fall 10	32	2.6
Not affected	216	17.3
Missing values	12	1.0
Total	1248	100.0

Second, the survey-based measure is less vulnerable to the timing problem of the registry-based measure discussed above, as it allows the CEOs themselves to define the start and the severity of the shock. I demonstrated how this might cause problems when discussing the results related to *market growth*. Third, the subjective measure better isolates the impact of the recession from firms' chosen responses to it and from all other non-recession-related factors affecting performance in the same period. Poor separation between the effects of the shock and the responses to it is a plausible explanation for why *cost strategy* and *quality strategy* were non-significant in Model 4R (registry-based measure), while they were significant in Model S4 (survey-based measure). Recall that theory implied that these strategies had different vulnerabilities to demand contractions in recessions, but not that firms with different strategies should respond to the recession in any particular way. This means that even if *cost strategy* and *quality strategy* are systematically associated with being less or more affected by a demand shock (as found in Model S4), heterogeneous responses to the shock may make these systematic effects difficult to find using the crude registry-based measure of demand, as it also captures the effects of the responses.

Because the survey- and registry-based measures of demand reductions have different strengths and weaknesses, we should view them as complements, rather than perfect substitutes. That is, using both increases the confidence in the results. With that said, for the purpose of this study, I believe that the survey-based measure does a better job than the registry-based measure at separating out the actual demand reductions firms experienced in the recession. Therefore, greater confidence should be put in the results calculated using the survey-based measure of demand contractions than in those calculated using the registry-based measure.

## 5. Conclusion

The purpose of this paper was to investigate why some firms are more severely affected by an environmental change, namely economic shocks like recessions. To accomplish this, I used data from a unique dataset of Norwegian firms during the recession of 2008 to 2009 and found systematic differences in how the recession impacted demand conditions across firms. For example, I found that high pre-recession market growth was one of the most influential factors for whether a firm experienced demand problems during the recession. Though this finding may seem somewhat counterintuitive, as high market growth is often associated with less intense rivalry, markets with high growth in booms are also more likely to experience severe drops in demand when recessions hit, making firms in such markets more likely to experience negative growth in a recession. I found the same relationship between demand reductions and firm-level growth. Similar counterintuitive results were related to the dimension of market competition. I found that competing on quality increased the negative effects of the shock, while the opposite appeared to be true for markets competing on price. The

conventional view is that markets with differentiated products are preferable to markets with homogenous goods and price competition, since the former faces more inelastic demand and less rivalry. My findings indicate that this is not necessarily the case in recessions, as a recessionary shock can alter demand in ways that may make markets with differentiated products more prone to demand problems. I found the same pattern when studying firm strategies. Firms with strategies emphasizing quality were more severely affected by the recession, while the opposite was true for firms with strategies emphasizing low costs. Firms with a high emphasis on innovation were also less likely to be severely hit by the recession.

The main contribution of this paper is to address a gap in the strategy and management literature related to understanding what makes some firms more likely to be severely affected by recessionary shocks than others. My analyses show that firms are affected differently by recessionary shocks depending on their pre-recession characteristics, which implies that recessionary shocks are not randomly assigned to firms. This insight has both theoretical and empirical implications for research on firms during economic downturns. Theoretically, these findings show that broad environmental changes affect firms differently, depending on characteristics of the firms and their market(s). This, in turn, implies that firms face different contingencies when responding to changes and that they are likely to respond in heterogeneous ways to their different challenges and opportunities. Empirically, my findings imply that we need to control for this non-random assignment of treatment when studying firms' responses to recessions to understand whether and how observed differences in responses and turnaround strategies are determined by managerial discretion and not only by systematic differences in how firms were affected. The findings of this paper highlight a set of variables that can be used as control variables in future studies on firms in economic downturns.

Second, the paper contributes to research streams focusing on firm performance and behavior over the business cycle by replicating earlier documented relationships in a different setting, on a more micro level, and with emphasis on certain relationships that have been awarded less (if any) attention in the extant literature. For example, research has shown that investments in innovation and R&D are less sensitive to fluctuations in demand, which has usually been explained by such investments' long time spans and high adjustment costs. This paper shows that firms with innovative strategies experience less demand contractions during a recession. This could imply that innovative firms not only shield their ongoing investments from fluctuations in demand by creating a financial buffer to withstand falling demand, but also target demand that is less likely to fluctuate over the business cycle in the first place. Another example is the findings related to durable goods share. The highly cyclical demand faced by durable goods industries is well-established in economics, but I add to this knowledge by showing that the share of durable goods in individual firms' product mixes can also increase demand contractions in a recession. In addition, I introduce firm strategies as important explanatory factors for how firms experience demand changes in a recession. Strategies have received surprisingly little attention in past business cycle research, perhaps because the majority of studies of firm performance in recessions rely on secondary data that are less suited to capture variations in firms' strategies. The overarching implication of this point is, therefore, that there is probably much to gain from collecting primary data on recessionary shocks to operationalize important firm characteristics that are more difficult to capture when relying solely on secondary data sources.

A third contribution of this paper is empirical and stems from my use of both registry-based and survey-based measures of demand reductions created by the recession. This approach improves confidence in the findings and allowed me to extract insights related to the strengths and weaknesses of the two measures. For the purpose of this study, I argued that the subjective measure of demand reduction makes it possible to better isolate the actual impact of the recessionary shock

from firms' responses to it and from all other recession-unrelated factors that affect firm performance in the same period. Both the empirical business cycle literature and the organizational decline literature commonly measure recessionary shock/organizational declines using percentage changes in performance measures over a set period. This paper's use of a subjective measure, therefore, highlights that considering the subjective views of managers as an alternative (or complement) to measures of demand reductions exclusively based on (yearly) registry data yields additional insights.

Finally, the findings of this paper have important implications for practitioners, as they present a set of factors that can easily be used to assess the vulnerability of different firms to recessionary shocks. The results are useful for managers who want to analyze the risks faced by their own firms and their competitors, or for investors and creditors who wish to assess the risks of potential borrowers/investments. For example, if a recession hits, managers can use the insights from this paper to understand how the recession is likely to alter the demand for their firm relative to competitors. This may guide competitive responses focused on counteracting expected negative demand effects or designing strategies to improve the firm's position vis-à-vis more vulnerable competitors.

In closing, I wish to reiterate that my empirical approach did not allow me to determine the exact mechanisms that drive the different

relationships. Still, my findings provide a set of “stylized facts” that represent a reasonable point of departure for future work aimed at unpacking the more detailed, underlying mechanisms that can explain *why* the different characteristics affect firms' vulnerability to recessions. Some of these relationships have been studied in the empirical business cycle literatures in economics, finance, and marketing; however, as much of this work either relies on crude registry-based measures of recessionary shocks and/or studies the relationships on a different analytical level, many questions remain unanswered. I believe that the strategy and management field, with its extensive focus on firm-level heterogeneity, is well-equipped to tackle these questions and extend our understanding of what really drives some firms to be more vulnerable to recessionary shocks than others.

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### Appendix A. Descriptions of dependent, independent and control variables

Variable	Explanation	Source
Demand reduction survey	Based on the following item: “How was your firm affected by the crisis? i) Demand for the firms products and services”. Scale: 1–7. 1 = increased demand, 4 = unchanged demand, 7 = reduced demand	Survey data
Demand reduction registry	Percentage change in sales income between 2007 and 2009. Multiplied with $-1$ so that a higher value indicates a higher reduction in demand	Registry data
Innovation strategy	Created by summing four items: “How important was the following for your firm in the competition with its closest competitors <u>before the recession?</u> i) innovation/R&D, ii) implementing new solutions (technologies, systems), iii) further develop existing products/services, iv) launch new products and services ( $\alpha = 0.808$ ). The scale ranges from 4 to 28 (1–7 per item), and a high number indicates a higher focus on innovation.	Survey data
Cost strategy	Based on one item: “How important was the following for your firm in the competition with its closest competitors <u>before the recession?</u> i) reducing costs. The scale ranges from 1 to 7, and a high number indicates a higher focus on cost reductions.	Survey data
Quality strategy	Created by summing two items: “How important was the following for your firm in the competition with its closest competitors <u>before the recession?</u> i) high customer service, ii) high quality of products/services ( $\alpha = 0.735$ ). The scale ranges from 2 to 14 (1–7 per item), and a high number indicates a higher focus on quality.	Survey data
Age	The natural logarithm of a firm's age in 2007.	Registry data
Size	The natural logarithm of firms' turnover in 2007	Registry data
Competitors	Based on the following item: “How many close competitors did the firm have in its main market before the recession”. Because the effect of number of competitors is likely to be non-linear (less effect of moving from 12 to 13 competitors than 2–3), I took the natural logarithm of the variable.	Survey data
Price competition	Based on the following item: “How strong was the price competition <u>before the recession?</u> ” Scale = 1–7, where 1 = weak and 7 = strong	Survey data
Quality competition	Constructed by summing four items related to the characteristics of the firms main market <u>before the recession:</u> i) heterogenous customer needs, ii) heterogeneity in customers' willingness to pay, iii) heterogeneity in product prices and iv) the number of variants available ( $\alpha = 0.708$ ). The scale ranges from 4 to 28 (1–7 per item), and a higher number indicates more differentiation.	Survey data
Durable goods share	Percent of total turnover from sales and/or production of durable goods, <u>before</u> the recession.	Survey data
Market growth	Based on the following item: “What was the yearly growth (change in the total market turnover) in the firms main market <u>before the recession?</u> ” Scale 1–7: 1 = ( $< -5\%$ ), 2 = ( $-5 - -1\%$ ), 3 = ( $-1 - +1\%$ ), 4 = (1–5%), 5 = (5–10%), 6 = (10–25%), 7 = ( $> 25\%$ )	Survey data
Entry rate	Based on the following item: “Before the recession, how often did firms enter the firm's main market?” Scale 1–5, where 1 is “never”, and 5 is “very often”.	Survey data
Export intensity	Percent of total turnover from international sales, before the recession.	Survey data
Debt-ratio 2007	Firm debt-to-asset-ratio in 2007	Registry data
Profits 2007	Firm operating profits 2007	Registry data
Firm growth 2007	Firm sales growth between 2006 and 07	Registry data
Industry dummies	Industry dummies based on two digit NACE codes.	Registry data

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