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Family Ownership Influence on Cost Elasticity

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Abstract This study explores the relation between family ownership and cost elasticity. Using a sample of 1746 European firms, we first find that family ownership, a prevalent ownership type with unique characteristics, is associated with greater cost elasticity. Further, we use four empirical settings to increase our confidence that a higher cost elasticity is attributable to family ownership. We also document that family firms achieve greater operating cost elasticity primarily through modifying SG&A costs in response to changing sales, but not by hiring or firing employees. These findings extend prior studies on ownership effects on cost structures, suggesting that family ownership matters in understanding firms' cost elasticity choices.

Keywords: Cost behaviour; Cost elasticity; Ownership; Family firms

JEL Codes: M41; D24; L23; D10

1. Introduction

Cost elasticity is a key firm choice, indicating the relative proportion of variable costs.[1] The classic microeconomic model does not identify differences in cost elasticity choices attributable to different ownership characteristics.[2] Particularly, the supply and demand model implies a similar cost function for two equivalent suppliers (e.g., companies with similar technology and input prices, operating at a similar scale). Recent studies show that ownership characteristics influence firms' cost structure choices. Hall (2016) documents that incentives related to ownership structure influence labor cost decisions in publicly traded versus privately held banks. Prabowo et al. (2018) and Gu et al. (2020) find that state ownership influences labor cost stickiness because state-owned firms are subject to different preferences and incentives (Grossman & Hart, 1986; Hart & Moore, 1990). This study extends this research by exploring whether and how family ownership influences cost elasticity.

Family firms are economically important because families control the majority of firms around the world and also play a vital role in capital markets (Anderson & Reeb, 2003; La Porta et al.,

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[1]Cost elasticity is the percentage change in costs in response to percentage change in activity level (or volume).
[2]See Kreps (1990) and Varian (2014).

1998; Lins et al., 2013).[3] Risk-averse family owners are more likely to select a low level of fixed costs to minimize threats (Anderson & Reeb, 2003; M. C. Anderson et al. 2003; Naldi et al., 2007). Furthermore, reputation concerns of family owners often lead to a strong monitoring of cost choices, potentially resulting in a prompter cost response to demand changes (R. C. Anderson et al., 2003; Belenzon et al., 2017; Kashmiri & Mahajan, 2010; Minichilli et al., 2022). Finally, a paternalistic culture encourages family owners and managers to make decisions more quickly to exploit unfolding opportunities (Dyer, 1988). In addition, long-term orientation in family firms is likely to result in actions to reduce survival threat (Aldamen et al., 2020). Overall, prior studies suggest that family owners have characteristics that lead them to increase variable costs to allow for greater flexibility, and thus we expect family firms to substitute fixed costs with variable costs, leading to greater cost elasticity than in non-family firms.

We use a large sample of European-listed firms and find that family firms exhibit more elastic cost structures and alter costs more promptly than non-family firms. Using a panel cross-sectional estimation approach, we find that, on average, the operating cost elasticity of family firms is 6% greater than the operating cost elasticity of non-family firms. We use a time-series approach to corroborate our findings. The results hold when we control for managerial sales expectations, demand uncertainty, and financial constraints (Banker et al., 2013, 2014; Kahl et al., 2019).

A potential issue with our argument is that our results may be driven by endogeneity arising from omitted variables that may affect both family ownership and cost choices. We address these concerns by testing potential changes in cost elasticity resulting from the death of a leader (chairperson/CEO/founder). In family firms, a family leader's death and replacement by an external (non-family) member is likely to reduce family influence on operational decisions (Davis & Harveston, 1998). We find a significant reduction in cost elasticity in family firms subsequent to a family leader's death, but no such effect in non-family firms, confirming a positive and significant relation between family ownership and cost elasticity.

We use four additional empirical settings to strengthen identification. First, we focus on founder family firms, as Zahra (2005) finds that a founder-owner is less likely to be risk averse. Excluding founder family firms from our sample significantly intensifies the association between family firms and cost elasticity. Second, we use eponymy (i.e., naming a firm after the founder) as a proxy of high reputation concerns *within* family firms. The results show significantly greater cost elasticity in eponymous than in non-eponymous family firms, in line with incentives induced by reputation concerns of owners of eponymous family firms (Belenzon et al., 2017; Minichilli et al., 2022). Third, we employ a setting characterized by large sales decreases. These unfavorable sales shocks simultaneously affect all shareholders and firms (Erkens et al., 2012), but the long-term orientation of family shareholders and their involvement in the decision-making process encourages family firms to promptly adjust resources to mitigate threat. The empirical evidence indicates substantially greater downward cost elasticity in response to large sale decreases in family firms than in non-family firms. In the same vein, we explore the setting of the 2008 financial crisis. Again, we find a significantly greater reduction in cost elasticity in response to this crisis in family firms than in non-family firms. Fourth, greater cost elasticity in family firms on both sales increases and decreases echoes greater cost elasticity to favorable and unfavorable sales shocks. Our results complement each other and are consistent with our prediction that family ownership is associated with more elastic cost structures.

Next, we explore how family firms achieve high cost elasticity by examining SG&A changes, R&D changes, and employee changes (from Compustat) in response to sales changes and find that, on average, family firms alter significantly more SG&A costs in response to sales changes

[3]Family businesses generate an estimated 70–90% of global GDP annually (Family Firm Institute, 2017), while 85% of startups worldwide are established with family money (Family Firm Institute, 2017 – Global Data Points).

than do non-family firms. When we further examine how firms alter SG&A costs in response to sales increases versus sales decreases, we find that changes of SG&A costs in response to sales shocks drive the incremental operating cost elasticity in family firms on both the upside and the downside. However, we find that changes in R&D costs in response to sales changes drive greater operating cost elasticity in family firms primarily on the upside, while changes in the number of employees insignificantly contribute to achieving greater operating costs elasticity in family firms. A plausible interpretation suggests that family firms restrain salaries by reducing shifts or cutting overtime payments and bonuses to avoid dismissals when sales fall, allowing them avoid firing more employees.

This study contributes to a stream of studies on the ownership effects on managerial cost structure choices. Hall (2016) documents how private vs. public bank ownership influences labor cost stickiness. Prabowo et al. (2018) and Gu et al. (2020) find that state ownership affects firms' labor cost structures. Our findings suggest that family ownership, characterized by risk aversion, reputation concerns, culture, and long-term orientation, influences cost elasticity. Moreover, we extend prior studies by taking a broader view of operating, SG&A, R&D, and number of employees cost elasticity. Our novel contribution lies in showing that family ownership shapes firms' cost structure choices.

Second, our findings expand our understanding of how family firms achieve greater cost elasticity. While family firms alter more SG&A costs in response to sales changes to achieve incremental cost elasticity, they do not exhibit any disparity in hiring or firing employees in response to sales changes, as compared to non-family firms. This result also contributes to the literature on corporate social responsibility (CSR) in family firms. An important dimension of CSR suggests that socially responsible actions by a family firm will be reciprocated by support from loyal employees (Galaskiewicz, 1985), driven by social norms and values (Uzzi, 1996). Kashmiri and Mahajan (2010) show that eponymy intensifies engagement in CSR practices in family firms. Dyer and Whetten (2006) argue that family firms are more socially responsible than non-family firms because of their higher reputation concerns and a stronger desire to protect family assets. Our findings, however, are consistent with a recent study reporting an insignificant difference in employee dismissals between family firms and non-family firms, and significantly greater voluntary employee turnover in family firms (Neckebrouck et al., 2018). Similarly, Gottschalck et al. (2020) document an insignificant difference in employee turnover rate in family and non-family firms. Our evidence adds to this debate by showing a similar tendency to fire employees in family and non-family firms when things turn for the worse, and that family firms decrease salaries by reducing shifts or overtime payments and bonuses to avoid employee dismissals.

Third, our work contributes to the growing literature on the organizational resilience of firms during crisis. Banker et al. (2020) show that existential threats during an economic slowdown motivate changes in cost structures. McKinsey & Company (2009) report that improving operational efficiency through cost management is a top objective of executives during an economic crisis. We show that family firms substitute fixed costs with variable costs faster than non-family firms during periods of economic downturn, in line with their ability to quickly respond to adverse circumstances. Our study extends prior studies on the effect of family ownership on performance during periods of political uncertainty, natural disasters, and financial crisis (Amore & Minichilli, 2018; D'Aurizio et al., 2015; Minichilli et al., 2016; Salvato et al., 2020). Specifically, our results, indicating more flexible cost structures in family firms, complement recent empirical evidence showing greater performance in family firms during the Covid pandemic due to their higher organizational resilience facilitated by cost structure adaptation (Amore et al., 2022).

Finally, our paper enriches a stream of prior studies on the family ownership effect on accounting choices. Family firms generally have better quality earnings (Wang, 2006) and are more likely to warn for a given magnitude of bad news (Ali et al., 2007), but they provide fewer earnings forecasts and conference calls (Chen et al., 2008). Family firms are also less tax aggressive

(Chen et al., 2010) and engage less in real earnings management practices (Achleitner et al., 2014). Our results complement this research by linking family ownership with a cost accounting choice of cost elasticity.

The study is structured as follows. In section 2, we discuss prior literature and develop our hypothesis. The research design and empirical models are described in section 3. In section 4, we present our main results, and in Section 5, we present evidence from four additional empirical settings. Section 6 examines how family firms achieve cost elasticity, and section 7 concludes the study.

2. Literature Review and Hypothesis Development

More elastic costs imply a higher percentage change in cost for a percentage change in activity level, which reduces firm risk (Holzhacker et al., 2015a). A decrease in demand will have a less negative effect on earnings in a firm with more elastic costs, because a greater proportion of costs will be saved. Firms with more elastic costs require lower sales to break even than do firms with less elastic costs (Balakrishnan et al., 2013; Holzhacker et al., 2015a). Lower fixed costs allow for more elastic costs, which lowers the breakeven level relative to firms with less elastic costs and leads to a lower likelihood of incurring losses due to a decrease in demand below the breakeven level. Accordingly, greater cost elasticity reduces exposure to low performance levels in adverse circumstances and decreases earnings volatility.

Prior research has documented the effect of ownership structure on cost decisions. Balakrishnan et al. (2004) is one of the earliest studies to document a significant association between private versus public ownership of hospitals and cost stickiness. Hall (2016) shows that public banks have more elastic labor costs than private banks, as they have more financial reporting pressure. Prabowo et al. (2018) suggest that state-ownership firms have stickier labor costs than private firms, as they have stronger sociopolitical goals. Similarly, Gu et al. (2020) document that state ownership and politically connected managers in China are positively associated with labor cost stickiness given the primary importance of social stability in the government's objectives. Extending this line of research, we focus on cost elasticity in family firms, a common and important type of ownership around the world with unique characteristics (Anderson & Reeb, 2003; Villalonga & Amit, 2006).

2.1. Unique Attributes of Family Firms

First, vast empirical evidence documents that family firms are more risk averse than non-family firms (R. C. Anderson et al. 2003; Dhillon & Rossetto, 2015; Miller et al., 2010; Naldi et al., 2007): the firm represents more than a tradable asset for family shareholders, in that it symbolizes the family's heritage (Bertrand & Schoar, 2006; Casson, 1999; Tagiuri & Davis, 1992). Prior studies suggest that family firms tend to invest in low-risk projects and activities (Carlin & Mayer, 2000, 2003; Faccio et al., 2001, 2011). McConaughy et al. (2001) and Mishra and McConaughy (1999) show that family firms avoid debt because their shareholders are more risk averse than other shareholders, and Caprio et al. (2011) find that family firms make fewer acquisitions and more cautious investments (see also Miller et al., 2010; Pindado et al., 2011). These studies suggest greater risk aversion in family firms than in non-family firms.

Banker et al. (2014) report that risk-neutral manufacturing firms will choose a higher capacity of fixed inputs when uncertainty increases to reduce congestion costs. Higher capacity levels imply a more rigid short-run cost structure with higher fixed and lower variable costs. Accordingly, incorporating risk aversion and holding demand uncertainty constant, greater risk aversion leads to greater cost elasticity. In a hospital setting, Holzhacker et al. (2015a) find opposite results to Banker et al. (2014), who find that demand uncertainty increases cost elasticity: if there is a decrease in sales, the impact of risk of financial default is greater than the impact of congestion risk when sales rise. Together, prior studies present opposing results obtained in different settings. To the extent that family firms are more risk averse than non-family firms, we expect family firms to prefer more elastic cost structures to reduce their exposure to adverse circumstances and to decrease earnings volatility.

Taking a different perspective, family owners prefer to protect their socioemotional wealth (SEW) (Gomez-Mejia et al., 2007, 2011), meaning that noneconomic reasons likely play an important role in explaining resource adjustment decisions in family firms (Prabowo, 2019). Preserving SEW implies that family owners might be hesitant to adjust resources downward in response to sales fall as they prefer to preserve their attachment to their firm's resources (Prabowo, 2019). That is, family owners prefer to minimize the risk of loss in SEW, even if their choices might imply a higher financial risk (Cennamo et al., 2012; Gomez-Mejia et al., 2011). Yet, families may preserve SEW also by avoiding profitable investments that might threaten firm control (Miller & Breton-Miller, 2014), thus restraining owners and managers from making upward resource adjustments when sales rise. Therefore, concern with SEW might point to an opposite effect of family ownership on cost elasticity.

Second, family shareholders have considerably high reputation concerns. High reputation concerns of family shareholders make them more sensitive to the adverse consequences of low performance. Also, higher reputation concerns lead founders of eponymous firms (e.g., firms named after the family) to directly monitor their managers (R. C. Anderson et al. 2003; Belenzon et al., 2017; Kashmiri & Mahajan, 2010). Accordingly, high reputation concerns are expected to induce incentives for stronger monitoring of cost response choices, potentially resulting in a prompter cost response to unfolding demand changes (Minichilli et al., 2022).

Third, family firms have a unique organizational culture, evolving as an efficient response to the institutional and market environments (Bertrand & Schoar, 2006). Given their paternalistic culture and their leaner bureaucratic organization, family firms make decisions quickly to exploit unfolding opportunities (Dyer, 1988). The alignment of ownership with managerial leadership then allows family businesses to respond when quick decision-making is required (Ward, 1997). Another cultural feature of family firms is their long-term horizon, which explains the greater resilience of family firms to the adverse effects of economic crises (Aldamen et al., 2020; Amann & Jaussaud, 2012). Family firms also make fewer and more cautious acquisitions (Caprio et al., 2011; Miller et al., 2010; Pindado et al., 2011), since shareholders consider the firm a long-term asset to pass on to future generations (De Vries, 1993). We thus expect family firms to more promptly modify resource levels in response to changes in sales than non-family firms, which will be reflected in greater cost elasticity.

Prior studies have not explored a potential disparity in cost elasticity between family and non-family firms. To the extent that family owners prefer to reduce firm risk, alleviate reputation concerns, and accommodate cultural attributes, we expect that family ownership is associated with higher cost elasticity. The following hypothesis summarizes this assertion.

HYPOTHESIS. Family firms have greater cost elasticity than non-family firms.

3. Research Design

3.1. Sample Choice

We start by identifying 5499 listed firms from European Union countries in Amadeus, a comprehensive European database compiled by Bureau van Dijk (BvD). After removing 1480 financial firms and 172 non-European firms listed in the database, 3847 firms remain. Next, to identify the

Table 1. Sample selection.

Listed firms from European Union in Amadeus – BvDEP, 2005–2019	5499
Less:	
– Financial firms	1480
– Non-EU firms listed in the EU	172
– Firms with no ownership data in the AMADEUS Ownership Database	1472
Total number of firms	2375
Total number of matched family firms	838
Total number of matched non-family firms	908
Total number of firms used in the matched analysis	*1746*
Total number of firm-year observations for matched family firms	6366
Total number of firm-year observations for matched non-family firms	6366
Total number of firm-year observations in the matched analysis	*12,732*

Note: This table shows the sample-firm selection criteria.

ownership structure, we follow Faccio et al. (2011) and use BvD's Ownership Database.[4] This database contains detailed ownership information, including the names of the global ultimate owner (GUO), that is, the individual or company atop the ownership structure.[5] The observation unit collected by the Ownership Database is the single link between a company and each shareholder, with additional information on total (direct and indirect) equity participation and the type of GUO (e.g., industrial company, state or government, one or more named individuals or families). We remove from the sample 1472 firms with no available ownership data. We gather accounting information from Compustat Global (Banker et al., 2013). The screening criteria are reported in Table 1. We arrive at a sample of 2375 firms for the period 2005–2019.

3.2. Family Ownership

We consider family firms to be firms that are ultimately controlled by a family or individuals, as in Lins et al. (2013). Specifically, we identify family firms as those with a GUO type denoted 'one or more named individuals or families' (type I in the Ownership Database) and owning, directly or indirectly, more than 25% of a firm's voting rights. Prior studies focusing on family ownership use a similar threshold (e.g., Andres, 2008; Franks et al., 2012). Using this filter, we initially identify 818 family firms. Whenever the GUO is another firm or cannot be identified, we follow Faccio et al. (2011) and manually collect ownership information from the firm's financial statements and corporate governance reports to identify its owners, the owners of its owners, and so on.[6] Following this approach, we find an additional 138 firms with families as the ultimate shareholders at a threshold of control, either direct or indirect, of 25% or higher. As in Banker et al. (2013), we use accounting data from Compustat Global for 2005–2019. We remove observations if sales or operating costs are missing or negative for the current or prior year. All data are in euros (or converted to euros for Denmark, Sweden, and the United Kingdom). We discard the top and bottom 1% of the distribution of all the variables on an annual basis. We report the variable definitions in the Appendix.

[4]The Bvd Electronic Publishing (BvDEP) Ownership Database is a source of owner and subsidiary links worldwide.
[5]Information on proprietary linkages from BvD is collected directly from official bodies, if any, or from national and international providers. In case of conflicting information among providers covering the same country, the Ownership Database is updated according to the latest available report.
[6]In these cases, the GUO type is "Industrial Company" (type C), "Foundation/Research Institute" (type J), and "Mutual & Pension Fund/Nominee/Trust/Trustee" (type E). Following Faccio et al. (2011), we exclude 69 firms for which the government is the GUO (type S, i.e., public authority, state, government), because governments' risk-taking preferences are typically different from those of private investors (Faccio et al., 2011).

3.3. Matching Procedure

We construct a control group of non-family firms to test the difference in cost elasticity between family and non-family firms. Family and non-family firms differ in numerous dimensions, such as firm size, asset intensity, labor intensity, and supply and demand factors. Industries and countries in Europe differ by technologies and level of innovation (OECD, 2018), whereas the frequency of family firms varies across industries and across countries (Anderson & Reeb, 2003; Faccio & Lang, 2002). Moreover, industries are characterized by different levels of demand uncertainty (Banker et al., 2014). Such differences can lead to significant disparities in firms' operations and, therefore, cost elasticity.

Even if we used reasonable control variables, our estimates could suffer from an omitted variable that is correlated with both family ownership and cost elasticity. Moreover, we could capture nonlinear effects if the linear controls do not sufficiently account for the differences between family and non-family firms. To alleviate these concerns, we use the coarsened exact matching (CEM) technique to correct for endogenous selection on the observed variables (Iacus et al., 2011). This technique avoids random matching problems, alleviating significant data requirements (Cohen & Li, 2020).[7] Specifically, we match family and non-family firms operating in the same country and in the same two-digit SIC code industry that have similar (within $\pm 20\%$) average size (total assets, *AT* in Compustat Global) and accounting returns (lagged return on assets, *ROA*).[8,9] Accordingly, the final matched sample for the cost elasticity analyses includes 838 family firms with 6366 firm-year observations and 908 non-family firms with 6366 firm-year observations (a total of 12,732 firm-year observations) from 13 EU countries. This matching procedure allows for comparison between family and non-family firms from identical countries and industries, with similar sizes, and lagged *ROA*.

3.4. Cost Elasticity: Testing the Hypothesis

Our estimate of cost elasticity follows a firm's response to demand shocks by following the standard microeconomic notion of cost elasticity. For any cost function $f(x)$, the elasticity of function f with respect to x can be expressed as $\vartheta \ln(f(x))/\vartheta \ln(x)$. It is conventional in the economics literature to empirically operationalize elasticity using a logarithmic function, whereby the above can be expressed as $\vartheta \ln(\text{costs})/\vartheta \ln(\text{activity level})$ (Kreps, 1990; Varian, 2014). Cost elasticity with respect to activity level refers to the percentage change in cost for a percentage change in activity level.

[7] According to DeFond et al. (2017, p. 3630), "CEM is essentially a variation of exact matching, but instead of matching on the exact values of covariates, it matches on a coarsened range (or strata) of covariates. By stratifying covariates, CEM alleviates the significant demands that exact matching imposes on the data. CEM also directly matches on the multivariate distributions of the covariates instead of matching on a single scalar (i.e., propensity score). As a result, CEM does not rely on the functional form and discriminative ability of a first-stage propensity score model, and considers higher moments of the covariate distributions."

[8] Matching by country and industry allows us to account for (invariant) unobserved heterogeneity within countries and industries, which subsumes common factors such as quality of institutions, labor regulations, and idiosyncratic industry characteristics and therefore could affect our results.

[9] Our matching procedure follows Barber and Lyon (1996). They advise researchers to use a performance variable (e.g., earnings) as a matching variable and argue that commonly used research designs (including matching by using firms' attributes other than performance) yield test statistics that are misspecified in cases where sample firms have performed either unusually well or poorly. Particularly, they find that matching treated firms to control firms on industry and performance is generally more important than matching them on industry alone (or on only country or size). Huson et al. (2004) advocate the matching method suggested by Barber and Lyon because it controls for potential mean reversion of accounting performance time series, which may affect measures of change variables (such as sales) in our study.

Yet, alternative explanations for setting higher cost elasticity in family firms are likely to create tension. Gaining further insights on the mechanism underlying cost elasticity choices, we examine three alternative explanations. First, we examine the effect of managerial expectations regarding future sales proxied by change in GDP (Banker et al., 2013). Second, since family-owned firms are more risk averse, they likely prefer to operate in less volatile business environments. Our proxy for demand uncertainty follows Banker et al. (2014). Third, prior studies reported some substitution between operating leverage implied by cost elasticity choice and financial leverage. Van Horne (1977) argues that firms with high operating leverage choose low financial leverage. Similarly, production flexibility increases financial leverage (Reinartz & Schmid, 2016). Mandelker and Rhee (1984) demonstrate how operating leverage contributes to systematic risk above and beyond financial leverage. Kahl et al. (2019) show that firms with high operating leverage have low financial leverage. We examine the effect of financial leverage on cost structure. Overall, we test the viability of these three alternative explanations in testing the hypothesis: sales expectations (ΔGDP), demand uncertainty (DU), and financial leverage (FL). All variables are defined in the Appendix.

We follow prior studies on cost behavior (e.g., M. C. Anderson et al. 2003; Holzhacker et al., 2015a; Weiss, 2010) and estimate the following cross-sectional model for each firm i and year t using sales as an imperfect proxy for activity level:

$$\begin{aligned}\mathrm{Ln}\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 \mathrm{Ln}\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 FF_{i,t} + \beta_3 FF_{i,t} \times \mathrm{Ln}\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right)\\ + \beta_4 GDP_t + \beta_5 GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t}\\ \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right)\\ + \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \qquad (1)\end{aligned}$$

where OC is operating costs, $SALES$ is total sales, and FF is the indicator for family firms. We use country, year, and industry fixed effects (Banker et al., 2013) and cluster standard errors by firm and year (Gow et al., 2010). The coefficient β_1 is an estimate of the percentage cost change per 1% change in sales, and the coefficient β_3 is an estimate of the incremental percentage cost change per 1% change in sales in family firms. The hypothesis predicts a positive and significant estimate for β_3, suggesting greater cost elasticity in family firms than in non-family firms.

3.5. *Data and Descriptive Statistics*

Table 2 presents the descriptive statistics. Panel A provides the distribution of observations by country and the mean of each variable used in equation (1). In our sample, there are more firms from the United Kingdom (about 26%) and a few observations from Portugal (0.5%). Panel B provides the distribution of observations broken down by family and non-family firms. The descriptive statistics on total assets (TA), ROA, and ΔGDP indicate that matching works well in our sample. Also, the difference in $\Delta SALES$ among family and non-family firms is statistically insignificant. However, we find that the mean demand uncertainty (DU) and financial leverage (FL) are lower for family than for non-family firms, thus suggesting that family firms operate in less volatile business environments and borrow less from external financing sources.

Table 2. Descriptive statistics.

Panel A: Sample distribution by country

Country	Obs.	Average ΔOC	Average ΔSALES	ΔGDP	Average FL	Average DU
Austria	74	0.024	0.018	1.516	1.496	0.150
Belgium	306	0.019	0.011	1.533	1.854	0.198
Denmark	178	0.023	0.020	1.351	1.567	0.178
Finland	378	0.034	0.033	1.099	1.373	0.209
France	2124	0.043	0.043	1.135	1.697	0.183
Germany	2684	0.041	0.040	1.446	1.595	0.190
Greece	402	– 0.010	– 0.019	– 1.554	2.031	0.234
Italy	540	0.018	0.019	– 0.101	2.396	0.209
Netherlands	222	0.022	0.024	1.473	1.631	0.219
Portugal	72	0.026	0.018	0.096	2.298	0.143
Spain	336	0.042	0.036	1.110	2.906	0.168
Sweden	2060	0.066	0.063	1.952	1.353	0.275
United Kingdom	3356	0.030	0.031	1.467	1.314	0.240

Panel B: Summary statistics by family and non-family firms

	Family Firms						Non-family Firms					
VARIABLES	*N*	Mean	StDev	1Q	Median	3Q	*N*	Mean	StDev	1Q	Median	3Q
ΔOC	6366	0.038	0.193	– 0.049	0.036	0.127	6366	0.039	0.198	– 0.048	0.035	0.124
ΔSALES	6366	0.039	0.213	– 0.050	0.039	0.132	6366	0.036	0.227	– 0.053	0.035	0.131
ΔGDP	6366	1.282	2.257	0.707	1.668	2.431	6366	1.283	2.201	0.732	1.668	2.431
DU	6366	0.207	0.212	0.087	0.144	0.248	6366	0.229[a]	0.245	0.089	0.152	0.270
FL	6366	1.469	2.059	0.628	1.193	2.098	6366	1.520[a]	1.867	0.758	1.191	1.935
TA	6366	18.796	2.119	17.276	18.631	20.256	6366	18.797	2.119	17.285	18.557	20.266
ROA	6366	0.015	0.116	– 0.003	0.033	0.070	6366	0.015	0.118	– 0.004	0.035	0.071

Note: Panel A presents the sample distribution and mean statistics for the variables used in the cost elasticity analysis by country. Panel B shows summary statistics for the variables used in the cost elasticity analysis for family and non-family firms. Variable definitions are reported in the Appendix. The variables are truncated at the 1st and 99th percentiles on an annual basis. [a] indicates that the difference in means/medians is significant at the 1% level.

4. Main Empirical Findings

4.1. Comparing Cost Elasticity Between Family Firms and non-family Firms

Testing a potential disparity in cost elasticity between family and non-family firms, we estimate the cross-sectional regression model in equation (1). The coefficient estimate β_1 for family firms, reported in column (1) of Table 3, is 0.909% per 1% change in sales, which is significant at the 1% level. The coefficient estimate β_1 for non-family firms, reported in column (2), is 0.834% per 1% change in sales, which is significant at the 1% level. Using the full sample, the coefficient estimate β_1 for non-family firms reported in column (3) is 0.845% per 1% change in sales, which is significant at the 1% level. Testing the significance of the difference, the coefficient estimate for the interaction $FF_{i,\mathrm{t}} \times Ln(SALES_{i,\mathrm{t}}\ /SALES_{i,\mathrm{t}-1})$, β_3, is 0.049% per 1% change in sales, and significant at the 5% level.[10] This result suggests that, on average, the operating cost elasticity in family firms is 5.8% (= (0.845 + 0.049)/0.845–1) greater than in non-family firms, in support of the hypothesis.

As for the alternative explanations, results in column (3) indicate that the coefficient estimate on the interaction $\Delta GDP_{\mathrm{t}} \times Ln(SALES_{i,\mathrm{t}}/SALES_{i,\mathrm{t}-1})$ is insignificant. The results also indicate that the coefficient estimate on the interaction $FL_{\mathrm{i,t}} \times Ln(SALES_{i,\mathrm{t}}\ /SALES_{i,\mathrm{t}-1})$ is 0.018 (p-value $< .01$).[11] In line with the literature, this result suggests a significant association between cost elasticity and financial leverage – i.e., greater financial leverage is associated with more variable costs and less fixed costs. The coefficient estimate on the interaction $DU_{i,\mathrm{t}} \times Ln(SALES_{i,\mathrm{t}}\ /SALES_{i,\mathrm{t}-1})$ is – 0.404 (p-value $< .01$). Consistent with Banker et al. (2014), greater demand uncertainty is negatively related to cost elasticity. Overall, we provide evidence of a significant association between family ownership and cost elasticity after controlling for alternative explanations.

4.2. Causality: Succession After a Leader's Death

A possible manifestation of endogeneity in the study is self-selection: shareholders selecting firms with a risk profile that best suits their preferences, rather than influencing these firms' risk-taking choices. To address this concern, we use a leader's sudden death as an exogenous shock triggering succession in family firms. The influence of family ownership is likely to decay over generations (Davis & Harveston, 1998; Villalonga & Amit, 2006) because some young family members choose to pursue a career outside the firm or establish their own business (Nordqvist & Zellweger, 2010). Another possible explanation for the decay of family influence on a leader succession relies on the appointment of non-family members as succeeding leaders. Overall, the death of a family leader is a potential exogenous event that triggers succession, which is likely to reduce the level of family influence (Chrisman & Patel, 2012). In family firms, therefore, a lower level of family influence after a family leader's death is expected to reduce cost elasticity.

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[10]We replicate the analyses using the actual values of the variables rather than their natural logarithm. The results are essentially the same.

[11]In sensitivity tests, we extend the model in equation (1) to control for a potential differential influence of firm age, operating cycle, national cultural dimension of long-term orientation as in Kitching et al. (2016), and country legal protection using the investor right index from the World Bank's website. We also estimated equation (1) using lagged sales as the denominator of the percentage change in operating costs, as suggested by Balakrishnan et al. (2014). All the findings (unreported for brevity) further support our hypothesis. In line with prior cross-country studies, however, we cannot perfectly rule out that some country-specific features affect our findings. To partially alleviate this concern, we test whether the findings are driven by the observations from the UK, which represent 26% of the entire sample. Results from estimating equation (1) excluding observations from the UK (unreported for brevity) remain unaffected.

Table 3. Cost elasticity in family vs. non-family firms: Cross-sectional estimation approach.

$$Ln\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 FF_{i,t} + \beta_3 FF_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_4 \Delta GDP_t$$
$$+\beta_5 \Delta GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t}$$
$$+\beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \quad (1)$$

VARIABLES	Family Firms (1) Coeff. (*t*-stat)	Non-family Firms (2) Coeff. (*t*-stat)	All firms (3) Coeff. (*t*-stat)
Intercept	0.021	0.044	0.036*
	(1.16)	(1.26)	(1.89)
$Ln(SALES_{i,t}/SALES_{i,t-1})$	0.909***,a	0.834***	0.845***
	(35.59)	(37.48)	(37.40)
$FF_{i,t}$			– 0.004*
			(– 1.75)
$FF_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$			0.049**
			(2.15)
ΔGDP_t	0.002*	0.002**	0.002***
	(1.73)	(2.31)	(2.60)
$\Delta GDP_t \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.004	– 0.006**	– 0.002
	(1.19)	(– 1.99)	(– 0.59)
$FL_{i,t}$	0.002**	0.001	0.001*
	(2.08)	(1.10)	(1.92)
$FL_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.017***	0.019***	0.018***
	(2.78)	(2.92)	(2.94)
$DU_{i,t}$	0.033**	0.026	0.029
	(2.05)	(1.10)	(1.64)
$DU_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	– 0.440***	– 0.382***	– 0.404***
	(– 6.44)	(– 8.74)	(– 9.07)
COUNTRY F.E.	YES	YES	YES
YEAR F.E.	YES	YES	YES
INDUSTRY F.E.	YES	YES	YES
N	6366	6366	12,732
Adj.-R^2	74.7%	63.6%	69.0%

Note: This table presents OLS coefficients and *t*-statistics (in parentheses) based on standard errors clustered by firm and year from equation (1). Column (1) and column (2) show the results for family and non-family firms, respectively, and column (3) presents the results using the full sample with the introduction of an interaction between $Ln(SALES_{i,t}/SALES_{i,t-1})$ and $FF_{i,t}$. *, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively. All variables are truncated at the 1st and 99th percentiles on an annual basis. For detailed variable definitions, refer to the Appendix.

[a]Indicates rejection of the hypothesis $\beta_{FF} = \beta_{NON-FF}$ at the 1% significance level following Holzhacker et al. (2015b, Table 7) in using the *z*-statistic to test for differences across groups as in Clogg et al. (1995) and Cohen (1983).

In contrast, the replacement of a leader is unlikely to systematically affect cost elasticity choices in non-family firms.

We test potential changes in the level of cost elasticity subsequent to leaders' death. The main advantage of this test is that the timing of leaders' death is likely to be exogenous, since death events are generally unexpected (Bruce et al., 1985). In addition, a test of the effect of leaders' death on cost elasticity choices is less prone to criticism related to the timing of succession driven by the death of a family leader (Bennedsen et al., 2007).

To perform this test, we gathered all announcements made by our sample firms from Key Development, a Compustat product. In these announcements, we searched for chairperson/CEO/founder (i.e., leader) deaths using the following keywords: *passed away, sudden death,* *suddenly died,* and *unexpectedly died* (Hayes & Schaefer, 1999). We then created an indicator variable, *POST*, which equals one for firm *i* from fiscal year $t + 1$ onward, and zero otherwise (i.e., fiscal years anteceding the death). We identify 17 death events, which includes eight events for family firms (58 firm-years after a death event) and nine for non-family firms (62 firm-years after a death event). In all eight cases of succession in family firms, the dead leader was a family member replaced by an outside manager – a manager who is not a member of the owning family, suggesting a decrease in family influence. We test the hypothesis by estimating the following specification based on equation (1) for family and non-family firms, separately:

$$\begin{aligned}\mathrm{Ln}\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 \mathrm{Ln}\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 POST_{i,t} + \beta_3 POST_{i,t} \times \mathrm{Ln}\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) \\ + \beta_4 GDP_t + \beta_5 GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{it} \\ \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) \\ + \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \qquad (2)\end{aligned}$$

where *POST* is an indicator variable that equals one in the fiscal years after the leader's death, and zero otherwise. Table 4 reports the results. As expected, the coefficient estimate β_3 is negative and significant for family firms, – 0.193 (p-value $< .05$) but statistically insignificant for non-family firms. This finding suggests that the death of the family leader is influential in family firms, resulting in significantly lower cost elasticity, in line with a decline in family influence on cost elasticity. However, the effect of the replacement of a dead leader on cost elasticity in non-family firms is insignificant.

One limitation of this test, however, is that only about 1% of the sample observations are from periods subsequent to the death events, which may not allow for reliable results. Partially overcoming this limitation, due to the paucity of leader death events, we estimate equation (2) using a firm-year sample with the eight family firms with leader death events and an additional randomly chosen 40 family firms. We repeat this exercise 1000 times. The coefficient estimate β_3 is negative and significant for family firms, – 0.201 (p-value $< .05$). Next, we estimate equation (2) using a firm-year sample with the nine non-family firms with leader death events and an additional randomly chosen 40 non-family firms and repeat this exercise 1000 times. The coefficient estimate β_3, 0.018, is insignificant for non-family firms.[12] These results corroborate our previous findings, thus suggesting a causal relation between family ownership and cost elasticity.

4.3. *Robustness Checks*

4.3.1. *Time-series analysis*

Although clustered standard errors address the concern of potential time-series dependence, we gain further confidence in the results by estimating a Fama-MacBeth (FM-*i*) time-series model. This modification of the Fama-MacBeth model is appropriate in the presence of some time-series dependence. In this analysis, we use windows of eight consecutive years of data per firm as in

[12]We cannot rule out, however, that other unobservable variables predicting both the choice of the successor and the subsequent change in cost elasticity may exist. Also, the study is limited in ruling out other explanations: for example, a change of cost elasticity in family firms after a death event might be the result of the founder's traits and managerial ability, not only family ownership.

Table 4. Exogenous shock: family leaders' sudden death.

$$Ln\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 POST_{i,t} + \beta_3 POST_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_4 \Delta GDP_t + \beta_5 \Delta GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{it} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \quad (2)$$

	Family Firms	Non-family Firms
	(1)	(2)
VARIABLES	Coeff. (*t*-stat)	Coeff. (*t*-stat)
Intercept	0.021	0.042
	(1.15)	(1.19)
$Ln(SALES_{i,t}/SALES_{i,t-1})$	0.911***	0.834***
	(35.55)	(37.27)
$POST_{i,t}$	– 0.005	0.015***
	(– 0.41)	(2.68)
$POST_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	– 0.193**,a	– 0.028
	(– 2.22)	(– 1.16)
ΔGDP_t	0.002*	0.002***
	(1.73)	(2.31)
$\Delta GDP_t \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.004	– 0.006**
	(1.16)	(– 1.98)
FL_{it}	0.002**	0.001
	(2.09)	(1.11)
$FL_{it} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.016**	0.019***
	(2.76)	(2.91)
DU_{it}	0.033**	0.026
	(2.07)	(1.10)
$DU_{it} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	– 0.442***	– 0.382***
	(– 6.44)	(– 8.72)
COUNTRY F.E.	YES	YES
YEAR F.E.	YES	YES
INDUSTRY F.E.	YES	YES
N	6366	6366
Adj.-R^2	74.8%	63.6%

Note: This table presents OLS coefficients and *t*-statistics (in parentheses) based on standard errors clustered by firm and year from equation (2). Column (1) and column (2) show the results for family and non-family firms, respectively. *, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively. All variables are truncated at the 1st and 99th percentiles on an annual basis. For detailed variable definition refer to the Appendix.
[a]Indicates rejection of the hypothesis $\beta_{FF} = \beta_{NON-FF}$ at 1% significance level following Holzhacker et al. (2015b, Table 7) in using the *z*-statistic to test for differences across groups as in Clogg et al. (1995) and Cohen (1983).

Aboody et al. (2018).[13] As a consequence, the sample size drops to 810 family firms and 881 non-family firms. Based on Kallapur and Eldenburg (2005), we estimate the following time-series model for each firm *i* and year *t*:

$$\text{Ln}\left(\frac{OC_{i,k}}{OC_{i,k-1}}\right) = \alpha + \beta_{i,t}\text{Ln}\left(\frac{SALES_{i,k}}{SALES_{i,k-1}}\right) + \varepsilon_{i,k,}\ k = t-8, t-7, \ \ldots, t \quad (3)$$

where, as above, *OC* is operating costs, and *SALES* is total sales. Thus, the coefficient β is an estimate of the percentage cost change per 1% change in sales. Testing the hypothesis, we expect

[13]Aboody et al. (2018) require at least eight years of data for each firm, Kallapur and Eldenburg (2005) require at least 16 years of data to be available for each hospital department, and Lev (1974) requires at least 20 years of data for each firm.

Table 5. Cost elasticity in family firms vs. non-family firms: Time-series estimation approach.

$$Ln\left(\frac{OC_{i,k}}{OC_{i,k-1}}\right) = \alpha + \beta_{\mathrm{i,t}} Ln\left(\frac{SALES_{i,k}}{SALES_{i,k-1}}\right) + \varepsilon_{\mathrm{I,k}}\ k = t-8, t-7, \ldots, t. \quad (3)$$

where *OC* is operating costs, and *SALES* is total sales.

	Family	Non-family		
	(1)	(2)	Diff. (1) – (2)	*t*-stat
$\beta_{i,t(mean)}$	0.869 $N_{\text{firms}} = 810$	0.835 $N_{\text{firms}} = 881$	0.034***	6.55

Note: This table presents the mean of the coefficient estimate, $\beta_{i,t}$, from equation (3) based on the FM-*i* estimation procedure in Gow et al. (2010) for family and non-family firms. We first estimate firm-specific time-series regressions using an 8-year rolling window (i.e., 7-rolling-change window). Second, we compute the significance levels based on the cross-sectional distribution of the firm – and time-specific mean coefficient estimates, $\beta_{i,t}$.*, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively.

a significantly greater mean estimate β for family firms than for non-family firms, suggesting a greater percentage cost response to a 1% change in sales. A greater percentage cost response to a 1% change in sales is consistent with greater cost elasticity.

Table 5 presents the results of estimating equation (3). Family firms alter operating costs by 0.869% per 1% change in sales, whereas non-family firms alter operating costs by 0.835% per 1% change in sales. The incremental operating cost elasticity of family firms is 0.034% per 1% change in sales (p-value $< .01$). We conclude that, on average, the operating cost elasticity in family firms is significantly greater than that in non-family firms, in line with the hypothesis.

4.3.2. Adjusting matching criteria

We test the sensitivity of the findings to the range of our matching criteria. Specifically, we adopt the CEM approach to construct a matched group of non-family observations using a ± 10% range for size instead of a ± 20% range. The sample size declines by 241 family firm-year observations, from 6366 to 6125 family firm-year observations. Untabulated results from using this sample for estimating equation (1) indicate a positive and significant interaction coefficient estimate β_3 (0.042, p-value $< .05$), thus supporting the hypothesis.

Additionally, we increase the number of variables to match family and non-family firm observations. Specifically, we also match by *DU* and *FL,* as both variables capture other risk attributes. The results (not reported) indicate a significantly greater cost elasticity in family firms than in non-family firms with comparable levels of *DU* and *FL*, thus suggesting that other characteristics of family firms, above and beyond risk aversion, such as their high reputation concerns and a unique organization culture, influence their incremental cost elasticity.

5. Four Empirical Settings

The previous section shows that family firms have significantly higher cost elasticity than non-family firms. In this section, we conduct tests based on four empirical settings that are biased in the sense of being especially likely to display family firms' unique characteristics, allowing us to obtain indirect insights into the extent to which family shareholders' unique preferences drive the observed family ownership – cost elasticity relation.

5.1. *Family Identification: Founder Firms*

In our first test, we focus on founder firms – i.e., firms that have founder shareholders. This test exploits the fact that founders have already built large firms, have proven entrepreneurial orientation, and have a fine track record for growing their businesses (Miller et al., 2007). As such, founders of family firms tend to accept high risks associated with exploring new ideas, innovating, or venturing into new markets and industries (Zahra, 2005). Therefore, we treat founder family firms as a key indication for the tendency to take high risk. Empirically, we searched Factiva, Bureau van Dijk, Google, and LexisNexis for further information on firms that individuals founded with little or negligible family involvement. We suspect that 104 firms identified as family firms in our sample have only individual ownership, with no equity holdings of other family members or family involvement. When we exclude founder firms and their matched firms, the sample is reduced to 11,002 firm-year observations. Results from estimating equation (1) are reported in Table 6. We find a positive and significant interaction coefficient estimate β_3 (0.082% per 1% change in sales, p-value $< .01$). Interestingly, the coefficient estimate for β_3 when founder firms are excluded, 0.082, is significantly greater than the coefficient estimate for β_3 using the full sample reported in Table 3 (0.033% = 0.082–0.049 per 1% change in sales, p-value $< .01$).[14] Overall, the results indicate a more pronounced association between family firms and cost elasticity when founder firms are excluded, consistent with lower risk aversion of founders of family firms.[15]

5.2. *Eponymous Firms*

In our second empirical setting, we use eponymy (i.e., naming a firm after the founder) as a proxy for reputation concerns to gain further indirect insights on how reputation concerns affect cost elasticity for family firms. We build on recent studies associating eponymous firms with the tendency to avoid risk because of the higher reputation costs deriving from a stronger identification between the entrepreneur and the firm. Consistent with a signaling model that emphasizes the reputational benefits and costs of eponymy (Belenzon et al., 2017), eponymous family firms are more concerned about reputation than non-eponymous family firms (Minichilli et al., 2022). Earlier studies emphasize the importance of how the market for names provides and sustains the reputation of owners and firms (Tadelis, 1999, 2002). These studies suggest that eponymy is associated with higher risk aversion and encourages managers to take actions that alleviate risk to protect the reputation of the founder and of the firm. Therefore, we assume that eponymous family firms are more risk averse than non-eponymous family firms, and we test the effect of eponymy on the level of cost elasticity *within* family firms.

We consider a family firm eponymous (*EP*) if the firm's name as reported in Compustat Global (*CONML*) includes the entire last name or the (standalone) initials of the first and last names of the founder(s)/GUO (Minichilli et al., 2022). Comparing cost elasticity choices between 150

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[14]We use the z-statistic for testing the hypothesis (β_3 full sample $= \beta_3$sample excluding founder firms). The result from the statistical test indicates rejection at the 1% significance level following Holzhacker et al. (2015b, Table 7) in using the z-statistic to test for differences across groups, as in Clogg et al. (1995) and Cohen (1983).

[15]We acknowledge that founder firms can differ in other ways that affect cost elasticity. They are likely to be younger firms in earlier lifecycle stages, they are likely to focus on growth, and the founder might be more overconfident than subsequent generations. Some of these differences encourage family firms to take risks, working against our hypothesis.

Table 6. Excluding founder family firms.

$$Ln\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 FF_{i,t} + \beta_3 FF_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right)$$
$$+\beta_4 \Delta GDP_t + \beta_5 \Delta GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right)$$
$$+\beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \sum \beta_k CountryFE_k$$
$$+\sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \quad (1)$$

	All firms	Family Firms	Non-family firms	All firms
	Table 3	Family firms without family founder		
	(1)	(2)	(3)	(4)
VARIABLES	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
Intercept	0.036*	0.016	− 0.065	− 0.014
	(1.89)	(0.85)	(− 1.61)	(− 0.71)
$Ln(SALES_{i,t}/SALES_{i,t-1})$	0.845***	0.900***	0.829***	0.824***
	(37.40)	(36.21)	(30.55)	(30.50)
$FF_{i,t}$	− 0.004*			− 0.002
	(− 1.75)			(− 0.57)
$FF_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.049**			0.082***
	(2.15)			(2.81)
ΔGDP_t	0.002***	0.004***	0.004**	0.004***
	(2.60)	(2.64)	(3.43)	(4.22)
$\Delta GDP_t \times Ln(SALES_{i,t}/SALES_{i,t-1})$	− 0.002	0.005	− 0.005	− 0.001
	(− 0.59)	(1.46)	(− 0.69)	(− 0.17)
FL_{jt}	0.001*	0.001	− 0.000	0.000
	(1.92)	(0.59)	(− 0.09)	(0.33)
$FL_{jt} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.018***	0.018***	0.013**	0.016***
	(2.94)	(4.92)	(2.25)	(2.89)
DU_{jt}	0.029	0.019	0.039***	0.031**
	(1.64)	(1.15)	(2.16)	(1.99)
$DU_{jt} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	− 0.404***	− 0.439***	− 0.434***	− 0.437***
	(− 9.07)	(− 6.68)	(− 9.10)	(− 11.34)
COUNTRY F.E.	YES	YES	YES	YES
YEAR F.E.	YES	YES	YES	YES
INDUSTRY F.E.	YES	YES	YES	YES
N	12,732	5501	5501	11,002
Adj.-R^2	69.0%	73.3%	58.7%	65.7%

Note: This table presents OLS coefficients and t-statistics (in parentheses) based on standard errors clustered by firm and year from equation (1). *, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively. Continuous variables are truncated at the 1st and 99th percentiles on an annual basis. All variables are defined in the Appendix.

eponymous and 688 non-eponymous family firms,[16] we estimate the following equation:

$$Ln\left(\frac{C_{i,t}}{C_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 EP_{i,t} + \beta_3 EP_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right)$$
$$+ \beta_4 GDP_t + \beta_5 GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t}$$

[16]The incidence of eponymy in our sample, 17.8% (150 / (150 + 688)), is similar to that reported in Belenzon et al. (2017), i.e., 19%.

$$\times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right)$$

$$+ \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \quad (4)$$

where *OC* is operating costs, *SALES* is total sales, and $EP_{i,t}$ is an indicator variable that equals one if firm *i* is eponymous on year *t*, and zero otherwise. The coefficient estimate β_1 for eponymous family firms, reported in column (1) of Table 7, is 1.027% per 1% change in sales, which is significant at the 1% level. The coefficient estimate β_1 for non-eponymous family firms, reported in column (2) of Table 7, is 0.885% per 1% change in sales, which is significant at the 1% level. The difference between these coefficients is reflected in the positive coefficient estimate for the interaction term, β_3 in column (3): 0.076% per 1% change in sales, which is significant at the 10% level. This result suggests greater operating cost elasticity for eponymous family firms than for non-eponymous family firms. The evidence is consistent with greater reputation concerns in eponymous family firms influencing incremental cost elasticity.[17]

5.3. *Large Sales Decreases and the 2008 Financial Crisis*

Our third test focused on firms facing negative economic shocks. First, we employ a setting where large sales decreases provide a negative shock affecting all shareholders and firms (Erkens et al., 2012). We expect family firms to be more responsive to a large sales drop than non-family firms to decrease the threat to firm survival. Specifically, we use large sales drops of over 20% in prior year sales as a firm-specific adverse shock to test the relation between family ownership and cost elasticity. We assume that large sales drops are plausibly exogenous. If family firms are more responsive to adverse circumstances induced by large sales decreases, we expect them to alter more costs downward in response to sales fall. We estimate the panel cross-sectional model in equation (1) using a subsample of observations with large sales decreases (larger than –20%). Table 8, column (1), reports the results. The coefficient estimate for β_3 is 0.262% per 1% decrease in sales (p-value $< .01$), suggesting a significant incremental cost elasticity for family firms relative to non-family firms. On average, the cost elasticity in family firms is 39.10% (= (0.670 + 0.262) / 0.670–1) greater than the cost elasticity in non-family firms. Our indirect evidence on greater cost elasticity in family firms in response to large sales drops is consistent with high risk aversion and long-term orientation of family owners.

Looking for additional evidence, we employ a setting characterized by an adverse external negative event – the 2008 financial crisis. Family firms are characterized by high risk aversion and a long-term orientation and are expected to be more responsive to adverse circumstances than non-family firms. Specifically, we expect family firms to alter more costs downward in response to sales fall during the 2008 financial crisis than do non-family firms. We estimate equation (1) using data from the 2008 financial crisis period to test whether family firms modify costs more than non-family firms in response to sales shocks, mainly sales drops. The results are reported in column (2) of Table 8. The coefficient estimate for β_3 reported in column (1) is 0.166% per 1% decrease in sales (p-value $< .05$), suggesting significant incremental cost elasticity for family firms relative to non-family firms. On average, the cost elasticity in family firms is 20.9% (= (0.792 + 0.166) / 0.792–1) greater than the respective cost elasticity in non-family firms, i.e., a higher cost elasticity following the exogenous adverse circumstances of the 2008 financial

[17] As a robustness test, we also match 1,080 eponymous family firm observations with the corresponding 1,080 non-eponymous non-family firm observations. The coefficient estimate on the interaction term, β_3, is 0.100% per 1% change in sales, and is significant at the 5% level, supporting our conclusion.

Table 7. Eponymous family firms.

$$Ln\left(\frac{C_{i,t}}{C_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 EP_{i,t} + \beta_3 EP_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_4 \Delta GDP_t + \beta_5 \Delta GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \sum \beta_k CountryFE_k + + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda \varepsilon_{i,t}, \quad (4)$$

	Eponymous family Firms	Non-eponymous family firms	All family firms
	(1)	(2)	(3)
VARIABLES	Coeff. (*t*-stat)	Coeff. (*t*-stat)	Coeff. (*t*-stat)
Intercept	0.005	0.018	0.020
	(0.30)	(0.95)	(1.06)
$Ln(SALES_{i,t}/SALES_{i,t-1})$	1.027***	0.885***	0.899***
	(23.72)	(31.00)	(31.66)
$EP_{i,t}$			0.000
			(0.08)
$EP_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$			0.076*
			(1.82)
ΔGDP_t	– 0.002	0.002**	0.002*
	(– 0.90)	(2.10)	(1.72)
$\Delta GDP_t \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.003	0.004	0.004
	(0.46)	(1.26)	(1.20)
$FL_{i,t}$	0.001	0.002**	0.002**
	(0.88)	(2.12)	(2.12)
$FL_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.031***	0.016**	0.016***
	(2.76)	(2.57)	(2.81)
$DU_{i,t}$	0.042**	0.029*	0.033**
	(2.03)	(1.67)	(2.08)
$DU_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	– 0.596***	– 0.407***	– 0.437***
	(– 12.56)	(– 5.72)	(– 6.18)
COUNTRY F.E.	YES	YES	YES
YEAR F.E.	YES	YES	YES
INDUSTRY F.E.	YES	YES	YES
N	1125	5241	6366
Adj.-R^2	85.2%	73.4%	74.8%

Note: This table shows the results of a test in which we distinguish between eponymous family and non-eponymous family firms. We consider a family firm eponymous (*EP*) if the firm's name, as reported in Compustat Global (item *CONML*), includes the entire last name or the initials (standalone) of the first and last name of the founder(s). The sample comprises 6366 firm-years of 838 family firms as in Table 3. OLS coefficient estimates and *t*-statistics (in parentheses) are based on standard errors clustered by firm and year from equation (4). Columns (1) and (2) show the results for 150 *EP* and 688 *N_EP* firms, respectively; column (3) presents the results with the introduction of the interaction between $Ln(SALES_{i,t}/SALES_{i,t-1})$ and *EP*. *, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively. Continuous variables are truncated at the 1st and 99th percentiles on an annual basis. All variables are defined in the Appendix.

crisis for family firms, in line with Lins et al. (2013). These results are consistent with family shareholders being more sensitive to the survival threat of the financial crisis than non-family firms, therefore choosing higher cost elasticity, in line with their high risk aversion and long-term orientation. The evidence from this analysis implies that family ownership induces greater cost elasticity in family firms.

Table 8. Large sales decreases and the 2008 financial crisis.

$$Ln\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 FF_{i,t} + \beta_3 FF_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_4 \Delta GDP_t$$
$$+\beta_5 \Delta GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t}$$
$$+\beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \quad (1)$$

VARIABLES	Large sales decreases Observations with ΔSALES $\leq -20\%$ (1) Coeff. (*t*-stat)	Financial crisis Observations on year 2008 (2) Coeff. (*t*-stat)
Intercept	– 0.020	– 0.002
	(– 0.22)	(– 0.26)
$Ln(SALES_{i,t}/SALES_{i,t-1})$	0.670***	0.792***
	(8.76)	(10.98)
$FF_{i,t}$	0.090**	0.003
	(2.30)	(0.43)
$FF_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.262***	0.166**
	(2.62)	(2.56)
ΔGDP_t	– 0.005	0.021
	(– 0.80)	(1.11)
$\Delta GDP_t \times Ln(SALES_{i,t}/SALES_{i,t-1})$	– 0.014*	0.084
	(– 1.86)	(1.55)
$FL_{i,t}$	– 0.002	– 0.004
	(– 0.32)	(– 0.14)
$FL_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	– 0.004	– 0.065*
	(– 0.24)	(– 1.84)
$DU_{i,t}$	– 0.009	– 0.004
	(– 0.15)	(– 0.36)
$DU_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	– 0.404***	– 0.274***
	(– 4.69)	(– 4.08)
COUNTRY F.E.	YES	YES
YEAR F.E.	YES	YES
INDUSTRY F.E.	YES	NO
N	1011	1156
Adj.-R^2	25.9%	64.8%

Note: Columns (1) and (2) present OLS coefficient estimates and *t*-statistics (in parentheses) based on standard errors clustered by firm and year from equation (1). The explanatory variable of interest is the interaction between $Ln(SALES_{i,t}/SALES_{i,t-1})$ and the indicator *FF*. *, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively. All variables are defined in the Appendix. Continuous variables are truncated at the 1st and 99th percentiles on an annual basis.

5.4. Upside and Downside Cost Elasticity

The cost stickiness literature documents differential cost elasticity between sales increases and decreases (see Banker et al., 2018). Separately testing cost elasticity in response to sales increases and decreases is likely to provide additional indirect evidence on the relation between family ownership and cost elasticity. We expect family firms to increase cost elasticity on both the downside and the upside to lower earnings volatility, which, in turn, reduces firm risk (Aboody et al., 2018; Lev, 1974).

We expand our main results by testing the differential cost elasticity between sales increases and decreases. This analysis is also important for testing the robustness of our previous results because cost response decisions involve a trade-off. Substituting committed resources with variable (flexible) resources implies weaker opportunities to exploit economies of scale on the upside, when sales rise (Banker et al., 2014). To address a potential disparity in cost elasticity between favorable and unfavorable sales shocks, we estimate the following cross-sectional model, separately for family and non-family firms:

$$Ln\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 SALE\_DEC_{i,t} + \beta_3 SALE\_DEC_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_4 GDP_t + \beta_5 GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \quad (5)$$

where *OC* is operating costs, *SALES* is total sales, and *SALE_DEC* is an indicator equal to 1 if change in sales is less than 0 in year *t*. Columns (1) and (2) in Table 9 present the results of estimating equation (5) for family and non-family firms, respectively. For sales decreases, the coefficient estimate $(\beta_1 + \beta_3)$ is 0.840% (= 0.943–0.103) per 1% change in sales for family firms and 0.727% (= 0.895–0.168) per 1% change in sales for non-family firms. The difference suggests that the incremental downward operating costs adjustment when sales fall by 1% is, on average, greater by 0.113% (= 0.840–0.727) for family firms than for non-family firms (p-value $< .01$).[18] This result suggests that family firms have greater operating cost elasticity when sales fall than non-family firms.

In a similar vein, for sales increases, the coefficient estimate β_1 is 0.943 for family firms and 0.895 for non-family firms. The difference suggests that the incremental upward operating costs growth when sales rise by 1% is, on average, greater by 0.048% (= 0.943–0.895) for family firms than for non-family firms. As before, the difference is positive and significant at the 1% level. This result suggests that family firms have greater cost elasticity when sales rise than non-family firms. Overall, family firms have significantly greater operating cost elasticity facing both favorable and unfavorable sales shocks.[19] Greater cost elasticity of family firms on both the downside and the upside implies lower earnings volatility, which, in turn, moderates firm risk (Aboody et al., 2018; Lev, 1974). This indirect evidence further supports the positive link between family ownership and cost elasticity.

The evidence from the four empirical settings presented in this section indirectly supports the relation between family ownership and cost elasticity. Notably, these results strengthen the empirical evidence supporting the hypothesis.

[18]We test the hypothesis $(\beta_1 + \beta_3)_{FF} = (\beta_1 + \beta_3)_{NON-FF}$ at the 1% significance level following Holzhacker et al. (2015b, Table 7) by using the *z*-statistic to test for differences across groups, as in Clogg et al. (1995) and Cohen (1983). We also estimate a triple-interaction model using the full sample for testing the hypothesis $(\beta_1 + \beta_3)_{\mathrm{FF}} = (\beta_1 + \beta_3)_{\mathrm{NON-FF}}$. Untabulated results confirm our results.

[19]This study focuses on cost elasticity and our partial insights on cost stickiness are limited. Prabowo (2019) documented SG&A cost stickiness in US family firms. Recently, Abudy and Shust (2022) used a small Israeli sample and report anti-sticky SG&A costs in family firms. SG&A costs reflect different resources than operating costs, and our large sample of 13 EU countries does not include either US nor Israeli firms. Additional research is necessary to examine cost stickiness in family firms.

Table 9. Asymmetric cost elasticity between favorable and unfavorable sales shocks.

$$Ln\left(\frac{OC_{i,t}}{OC_{i,t-1}}\right) = \alpha + \beta_1 Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_2 SALE\_DEC_{i,t} + \beta_3 SALE\_DEC_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_4 \Delta GDP_t + + \beta_5 \Delta GDP_t \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_6 FL_{i,t} + \beta_7 FL_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \beta_8 DU_{i,t} + \beta_9 DU_{i,t} \times Ln\left(\frac{SALES_{i,t}}{SALES_{i,t-1}}\right) + \sum \beta_k CountryFE_k + \sum \beta_j YearFE_j + \sum \beta_\lambda IndustryFE_\lambda + \varepsilon_{i,t}, \quad (5)$$

	Family	Non-family
	(1)	(2)
VARIABLES	Coeff. (*t*-stat)	Coeff. (*t*-stat)
Intercept	0.019	0.043
	(1.01)	(1.19)
$Ln(SALES_{i,t} /SALES_{i,t-1})$	0.943***	0.895***,a
	(48.06)	(28.06)
$SALE\_DEC_{i,t}$	− 0.007	− 0.010**
	(− 1.43)	(− 2.19)
$SALE\_DEC_{i,t} \times Ln(SALES_{i,t} /SALES_{i,t-1})$	− 0.103**	− 0.168***,a
	(− 2.01)	(− 3.51)
ΔGDP_t	0.002*	0.002**
	(1.74)	(1.98)
$\Delta GDP_t \times Ln(SALES_{i,t} /SALES_{i,t-1})$	− 0.000	− 0.013***
	(− 0.10)	(− 4.56)
$FL_{\mathrm{i,t}}$	0.002**	0.001
	(2.05)	(1.07)
$FL_{\mathrm{i,t}} \times Ln(SALES_{i,t} /SALES_{i,t-1})$	0.015***	0.017**
	(2.79)	(2.39)
$DU_{\mathrm{i,t}}$	0.021	0.006
	(1.47)	(0.31)
$DU_{\mathrm{i,t}} \times Ln(SALES_{i,t} /SALES_{i,t-1})$	− 0.415***	− 0.352***
	(− 5.83)	(− 8.02)
COUNTRY F.E.	YES	YES
YEAR F.E.	YES	YES
INDUSTRY F.E.	YES	YES
$\beta_{1+}\beta_3$	0.840***	0.727***,a
N	6366	6366
Adj.-R^2	74.9%	64.0%

Note: This table presents OLS coefficient estimates and *t*-statistics (in parentheses) based on standard errors clustered by firm and year from equation (5). *, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively. All variables are defined in the Appendix. Continuous variables are truncated at the 1st and 99th percentiles on an annual basis.

[a]Indicates rejection of the hypothesis $\beta_{\mathrm{FF}} = \beta_{\mathrm{NON-FF}}$ at 1% significance level following Holzhacker et al. (2015b, Table 7) in using the *z*-statistic to test for differences across groups as in Clogg et al. (1995) and Cohen (1983).

6. How do Firms Achieve High Cost Elasticity?

Our analysis thus far suggests that family firms have higher cost elasticity than non-family firms. A natural question arising is how family firms achieve greater cost elasticity. This section addresses this issue. Firms make discrete changes to committed resources because some committed resources cannot be increased or decreased in small increments or quickly enough to respond to changes in demand. Making capacity investments in advance, before demand is realized, will increase fixed costs and likely imply lower cost elasticity. If a firm reaches its capacity and demand rises, fulfilling demand by turning to a supplier results in higher marginal cost. As an alternative to making capacity investments in advance, firms can either bear high marginal costs per unit associated with acquiring external suppliers to respond to demand that exceeds capacity or they can forego sales that exceed capacity (Noreen, 2017). Prior cost accounting studies suggest that firms have some leeway in acquiring or discarding committed resources and can influence their cost elasticity.[20] Airlines, for example, tend to outsource aircraft maintenance to external suppliers with power-by-the-hour contracts. These maintenance contracts substitute fixed costs with variable costs, resulting in more elastic costs (Sedatole et al., 2012). Prior research also documents that hospitals can take various operative actions that influence the level of cost elasticity (Holzhacker et al., 2015a).

Although an international study is limited in using comparable data on firm-specific resources, we are able to examine SG&A costs, R&D costs, and changes in the number of employees (from Compustat), as in prior studies (e.g., Banker et al., 2020). We expect that changes in these three cost components provide insights on the mechanism through which firms modify their cost elasticity.

Starting with summary statistics, we compute the median percentage change in costs for a percentage change in sales. Table 10, Panel A, indicates a significantly higher median percentage change in operating cost to percentage change in sales for family firms (0.941) than for non-family firms (0.918) (p-value $< .05$), in line with the hypothesis. Further examining the three components of operating costs, the results reveal a higher median percentage change in SG&A cost to percentage change in sales for family firms (0.691) than for non-family firms (0.591). Similarly, the median percentage change in R&D cost to percentage change in sales is 0.585 for family firms and 0.441 for non-family firms. In both cases, the difference is significant (p-value $< .05$). Finally, we find that the median percentage change in the number of employees to percentage change in sales is 0.457 for family firms and 0.385 for non-family firms. This difference, however, is statistically insignificant. Overall, this evidence suggests that family firms achieve greater operating cost response than non-family firms by altering more SG&A and R&D costs. However, as compared to non-family firms, they do not exhibit significantly different changes in the number of employees in response to sales change.

Next, we separately examine cost responses to sales increases versus sales decreases. For sales increases, we find a significant difference in response to a percentage change in sales (p-value $< .05$) between family and non-family firms in the median percentage change in SG&A cost (0.777 for family firms and 0.678 for non-family firms) and in the median percentage change in R&D cost (0.942 for family firms and 0.782 for non-family firms). The median change in the number of employees to a percentage change in sales in family firms is marginally higher (0.592) than in non-family firms (0.491) (p-value $< .10$). For sales decreases, however, we observe a somewhat different pattern: while we find a significant difference (p-value $< .10$) in the median percentage change in SG&A cost to a percentage change in sales (0.484 for family firms and 0.447 for non-family firms), we find an insignificant difference between the median percentage change in R&D cost to a percentage change in sales (0.029 for family firms and 0.128 for non-family firms). Also, the difference in change in the number of employees to a percentage change in sales is not statistically significant (0.123 for family firms and 0.182 for non-family firms).

Collectively, the evidence suggests that a greater cost response in family firms is induced by SG&A costs, when sales both rise and fall. Moreover, we observe a significantly greater change in R&D costs in family firms than in non-family firms on the upside, but an insignificant difference in the extent to which family firms alter R&D costs on the downside. The evidence of

[20] As a real-life example of actions that firms take to modify their cost structure, Guess, a family-owned apparel marketer founded by the Marciano family in 1981, reports strengthening its "ability to control variable costs such as cost of sales and *payroll* and, in some cases, renegotiate lease costs" (Guess 10-K 2017, 56).

Table 10. Cost component analysis.

Panel A: Descriptive statistics

	All obs.		Sales increases		Sales decreases	
VARIABLES	Family	Non-family	Family	Non-family	Family	Non-family
$\Delta OC_t / \Delta SALES_t$	0.941	0.918 [a]	0.949	0.907 [a]	0.926	0.874 [b]
$\Delta SGA_t / \Delta SALES_t$	0.691	0.591 [a]	0.777	0.678 [a]	0.484	0.447 [b]
$\Delta RD_t / \Delta SALES_t$	0.585	0.441 [a]	0.942	0.782 [a]	0.029	0.128
$\Delta EMP_t / \Delta SALES_t$	0.457	0.385	0.592	0.491 [b]	0.123	0.182

Panel B: Regression analysis

	$Ln(SG\&A_{i,t} / SG\&A_{i,t-1})$	$Ln(R\&D_{i,t} / R\&D_{i,t-1})$	$Ln(EMP_{i,t} / EMP_{i,t-1})$
	(1)	(2)	(3)
VARIABLES	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
Intercept	0.018	0.065	0.174***
	(0.50)	(1.21)	(4.88)
$Ln(SALES_{i,t} / SALES_{i,t-1})$	0.518***	0.335***	0.454***
	(22.64)	(4.33)	(20.05)
$FF_{i,t}$	− 0.000	0.011**	− 0.005
	(− 0.09)	(2.28)	(− 1.63)
$Ln(SALES_{i,t} / SALES_{i,t-1}) \times FF_{i,t}$	0.082***	0.128**	0.039
	(3.14)	(2.32)	(1.54)

(*Continued*).

Table 10. Continued.

Panel B: Regression analysis			
	$Ln(SG\&A_{i,t}/SG\&A_{i,t-1})$	$Ln(R\&D_{i,t}/R\&D_{i,t-1})$	$Ln(EMP_{i,t}/EMP_{i,t-1})$
	(1)	(2)	(3)
VARIABLES	Coeff. (t-stat)	Coeff. (t-stat)	Coeff. (t-stat)
GDP_t	0.001	0.010*	0.001
	(0.94)	(1.84)	(0.69)
$GDP_t \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.011***	0.018*	− 0.000
	(2.92)	(1.84)	(− 0.10)
$FL_{i,t}$	− 0.000	0.006	− 0.001
	(− 1.46)	(1.11)	(− 1.19)
$FL_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	0.000*	0.000	0.004
	(1.87)	(0.00)	(0.80)
$DU_{i,t}$	0.016	0.060*	0.014
	(1.17)	(1.82)	(0.89)
$DU_{i,t} \times Ln(SALES_{i,t}/SALES_{i,t-1})$	− 0.228***	− 0.190***	− 0.386***
	(− 6.47)	(− 3.22)	(− 9.23)
COUNTRY F.E.	YES	YES	YES
YEAR F.E.	YES	YES	YES
INDUSTRY F.E.	YES	YES	YES
N	10,742	4748	7396
Adj.-R^2	28.11%	3.64%	22.37%

Note: Panel A presents median values of the ratios between changes in cost components (*ΔSGA, ΔRD, ΔEMP)* and changes in sales *(ΔSALES)* for family and non-family firm observations. The variables are truncated at the 1st and 99th percentiles on an annual basis.

[a, b]indicates a significant difference in means at the 5% (10%) level or below between the median values of the variables computed for family and non-family firms using one-sided test.

Panel B shows OLS coefficient estimates and *t*-statistics (in parentheses) based on standard errors clustered by firm and year from equation (1). *, **, and *** represent significance levels (two-tailed) of 0.10, 0.05, and 0.01, respectively. All variables are defined in the Appendix.

changes in number of employees indicates an insignificant response on the downside and only a marginal response on the upside.

Next, we reestimate the cross-sectional model in equation (1) by replacing the dependent variable ΔOC with the variables $\Delta SG\&A$, $\Delta R\&D$, and ΔEMP. Table 10, Panel B, shows the results. The results for $\Delta SG\&A$, presented in column (1), indicate a significant and positive coefficient estimate β_3 (0.082). Similarly, the results for $\Delta R\&D$, reported in column (2), reveal a significant and positive coefficient estimate β_3 (0.128). The results for changes in the number of employees, ΔEMP, in column (3), indicate an insignificant coefficient estimate β_3 (0.039). Overall, these regression estimates confirm significantly greater elasticity of SG&A and R&D costs in family firms than non-family firms. However, altering the number of employees in response to sales changes does not exhibit a significant difference in elasticity between family and non-family firms.

Overall, the incremental operating cost elasticity in family firms stems from changes in SG&A and R&D costs. Changes in the number of employees are not prominent in driving the incremental cost elasticity in family firms. While the literature offers no evidence on R&D cost elasticity in family firms, a behavioral agency approach suggests that family owners may be simultaneously capable of risk willingness and risk aversion in their strategic choices (Carney et al., 2015; Prabowo, 2019). Prior studies provide mixed results on the extent of employee dismissals and labor turnover in family firms. Neckebrouck et al. (2018) report a similar rate of dismissals and slightly greater voluntary employee turnover in family firms than in non-family firms. Gottschalck et al. (2020) observe higher turnover intentions in white-collar workers with leadership responsibility in family firms. Schulze et al. (2001) and Villalonga and Amit (2006) also provide evidence of significant personnel-related agency costs in family firms. In contrast, other studies document that family firms offer greater job security (Carrasco-Hernandez & Sánchez-Marín, 2007; Sraer & Thesmar, 2007). For example, Bassanini et al. (2013) find that family firms dismiss fewer employees than non-family firms when they downsize. Block et al. (2019) find that family firms offer higher job security and a more cooperative working environment, resulting in lower employee turnover (Dyer & Whetten, 2006).

Our findings suggest no significant difference in hiring and firing employees in response to sales changes between family firms and non-family firms. This result is consistent with Neckebrouck et al. (2018) and Gottschalck et al. (2020), who show no lower rate of employee dismissals in response to sales fall in family than in non-family firms. Since SG&A costs include employee salaries, a plausible interpretation of the findings is that family firms tend to restrain salaries by reducing shifts or cutting overtime payments and bonuses to avoid dismissals when sales fall. This allows them to alter more SG&A costs in response to sales change than non-family firms without firing more employees. The findings are in line with family firms preserving their SEW and their established corporate culture and employee loyalty, which could be disrupted by frequent changes in the employee base.

7. Concluding Remarks

In this study, we investigate the relation between family ownership and cost elasticity. Using a matched sample of family and non-family firms, we document a significant positive relation between family ownership and cost elasticity. This relation remains robust to controlling for endogeneity issues related to self-selection, unobservable, time-invariant, firm-specific factors, and to the use of an alternative time-series estimation model. We then draw insights into how family firms achieve greater cost elasticity and find evidence that family firms modify primarily SG&A costs while they contain changes in the number of employees in response to sales changes.

Overall, our results suggest that a full understanding of cost behavior requires a careful analysis not only of firm-specific factors, but also of the ownership features that shape managers' cost decisions.

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Appendix: Empirical definitions of the variables and sources

Variable	Variable definition	Data source
ΔSALES	Ln($SALES_t$) – Ln($SALES_{t-1}$), where *SALES* is the natural log of sale revenues (*SALE*)	Compustat Global
ΔOC	Ln(OC_t) – Ln(OC_{t-1}), where *OC* is the natural log of operating costs (*XOPR*)	Compustat Global
ΔGDP	Annual change in country's gross domestic product (*GDP*)	World Bank
DU	Standard deviation of firm *i*'s *ROA* from *t*-5 to *t*	Compustat Global
FL	Total liabilities (*LT*) divided by shareholders' equity (*SEQ*)	Compustat Global
TA	Natural log of total assets (*AT*) for firm *i* in year *t*	Compustat Global
ROA	Earnings (*IB*) divided by average total assets (*AT*)	Compustat Global
SALE_DEC	Indicator equal to 1 for sales decreases	Compustat Global
ΔSG&A	Ln($SG\&A_t$) – Ln($SG\&A_{t-1}$), where *SG&A* is the natural log of SG&A costs (*XSGA*)	Compustat Global
ΔR&D	Ln($R\&D_t$) – Ln($R\&D_{t-1}$), where R&D is the natural log of R&D costs (*XRD*)	Compustat Global
ΔEMP	Ln(EMP_t) – Ln(EMP_{t-1}), where *EMP* is the number of employees	Compustat Global
INDUSTRY F.E.	2-digit SIC code dummies	Compustat Global
YEAR F.E.	Year dummies	Compustat Global
COUNTRY F.E.	Country dummies	Compustat Global
Experimental variable		
FF	1 if one or more individuals or family/families are classified as the GUO with at least 25% of voting rights	Amadeus (BvD) and manual collection
EP	1 if the entire last name or the (standalone) initials of the first and last name of the founder(s)/GUO are included in the firm's name as reported in Compustat Global (*CONML*)	Compustat Global and manual collection
POST	1 for firm-years after the year of the leader's death	Key Development – Compustat