Risk Disclosure in Business Communication during Pandemic: Evidence from Family Firms

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Abstract

This paper investigates the role of family ownership in shaping risk disclosure in response to the events caused by the recent outbreak of COVID-19 pandemic. Using the Loughran and McDonald's (2011; 2016) and Kravet and Muslu's (2013) bag of words, we find that family-owned firms use a lower level of risk disclosure. This finding is consistent with the argument that family firms have more resilient organizations, and thus expect to better handle the uncertainty of a disruptive shock. In an additional analysis, we find, however, that risk disclosure increases when family firms are governed by older CEOs, who are possibly more concerned about the ability of future-generation CEOs to overcome the current crisis. The results contribute to the recent literature on the drivers of organizational resilience during extreme events such as natural disasters, financial crises, and spikes in political uncertainty.

Keywords: Risk disclosure, Family Firms, COVID-19 Pandemic.

1. INTRODUCTION

The coronavirus (COVID-19) pandemic has triggered an unprecedented spike in uncertainty in nearly every aspect of daily life: the infectiousness and lethality of the virus; the capability of healthcare systems to adapt to a surge in demand and to develop a vaccine; the duration and effectiveness of containment measures (*e.g.*, lockdowns, social distancing, travel bans, etc.) and their impact on future economic activity and employment. Financial markets have been hit severely (Baker et al., 2020a; 2020b), business activities have collapsed with effects on unemployment ten times larger than during the 2007-2009 financial crisis (OECD, 2020). In this scenario, firms have been urged to evaluate and communicate risks about their future strategies and actions. Larcker et al. (2020) document that the COVID-19 pandemic provides a unique opportunity to examine firms' disclosure in a situation of extreme uncertainty that extends across firms and countries. Following this call, in this paper we examine whether ownership matters in shaping firm's risk disclosure. Specifically, we examine the association between family firms and risk disclosure in corporate narratives during the first five months of the pandemic outbreak. Family firms are a relevant organization form worldwide. They represent about 46 percent of S&P 1500 index in the U.S. (Anderson and Reeb, 2003a; 2003b), 44 percent of large corporations in Western Europe (Faccio and Lang, 2002), and over two-thirds of firms in East Asian countries (Claessens et al., 2000). Family firms are also dominant in Latin America and in Africa (Burkart et al., 2003; Martínez et al., 2007). Moreover, they operate in a broad set of industries (Anderson and Reeb, 2003a; 2003b; Villalonga and Amit, 2006; 2010). Therefore, the issue we investigate has a large scope of interest.

Prior literature documents that family firms are characterized by unique managerial and organizational traits, as they are driven, in addition to financial goals, by the objective to preserve their social emotional wealth (SEW), *i.e.*, the emotional attachment that family

members have toward the firm (Gómez-Mejía et al., 2007). Specifically, SEW influences a large range of strategic, operational and accounting decisions in family firms, such as investment horizon (Wang, 2006), investment diversification (Gómez-Mejía et al., 2010), internationalization (Villalonga et al., 2019), acquisitions and divestitures (Miller et al., 2010; Feldman et al., 2016), capital structure (Romano et al., 2001), management succession (Bertrand and Schoar, 2006), and financial reporting quality (Ali et al., 2007; Chen et al., 2008; Gómez-Mejía et al., 2014). To preserve their SEW, family firms exhibit a superior organizational resilience compared to their nonfamily firm counterparts. This feature allows family firms to leverage on long-term horizons and ultimately curtail the adverse influence of uncertainty on their probability of survival. Existing works show that family firms are better equipped, due to their social and political capital, to cope with negative shocks, such as periods of increased political uncertainty (Amore and Minichilli, 2018), financial crises (D'Aurizio et al., 2015; Minichilli et al., 2016), natural disasters (Salvato et al., 2020). Thus, the objective to preserve SEW coupled with a superior set of resources and social relations can, not only help family firms overcome a pandemic (Amore et al., 2021), but also more positively affect managerial sentiment about future performance, *i.e.*, the CEOs' beliefs about firm's prospects in periods of heightened uncertainty.

Our research question is premised on the notion that managers are affected by information about macroeconomic fundamentals, which arguably influence their estimates, beliefs and, ultimately, their disclosure (Lemmon and Portniaguina, 2006; Hribar et al., 2017). For example, Brown et al. (2012) documents that managerial sentiment affects managers' pro forma disclosures, while Li (2008) finds that firms with lower reported earnings tend to have annual reports that are harder to read.

However, none of the existing works to our knowledge have investigated the effect of family ownership on risk disclosure in the wake of an unprecedented and unexpected rise in uncertainty.[1] Yet, this is important for at least two reasons. First, in a period of high uncertainty, it is important for businesses to communicate how they are responding to the crisis to their investors and stakeholders (Clayton and Hinman, U.S. Securities and Exchange Commission, 2020; Deloitte, 2020b). This way, investors and key stakeholders can have the information they need to assess the company resiliency and preparedness both during and after the crisis. Second, and more important, during the first months of the pandemic, the world has experienced a plethora of communication approaches and containment actions across countries and organizations to limit the spread of the virus (McKinsey & Company, 2020; EY, 2020). Our results suggest that the presence of resilient organizations, such as family firms, can be one of the factors shaping a company's communication approach.

Using a sample of 12,030 press releases of 1,433 firms from 17 Western European countries during January 1st–May 15th, 2020, we test and find support for our hypothesis. Specifically, we find that the presence of a family owner is associated with a lower level of risk disclosure during the pandemic. In a first additional test, we expand our analysis to examine cross-sectional effect of CEO's characteristics. Specifically, we explore whether CEO age and gender in family firms influence the risk disclosure during the COVID-19 pandemic. We observe that the CEO age is positively associated with risk disclosure, consistent with the notion that more senior CEOs are more likely to experience a succession event and they are thus more concerned about the ability of future-generation, usually less performing, CEOs to overcome the

[1] Ahir, Bloom, and Furceri (2021) develop the World Pandemic Uncertainty Index (WPUI) using the frequency of the word "uncertainty" within a proximity to a word related to pandemics in the Economist Intelligence Unit (EIU) country reports. The index is the percent of the word "uncertain", and its variants, appearing near pandemic terms in EIU country reports, multiplied by 1,000. A higher number means higher uncertainty related to pandemics. The WPUI took on a value of 15.91 in the first quarter of 2020 compared to 4.39 in the first quarter of 2003 (when SARS broke out): an increase by 361 percent. https://fred.stlouisfed.org/series/WUPI.

crisis. We do not find, however, any association between gender and risk disclosure. More importantly, controlling for these two additional managerial factors does not alter any of the inference in our main analysis.

In a second additional analysis, we test whether firm's resilience provides a concurrent explanation for our main results. Belenzon et al. (2017) show that in eponymous firms (*i.e.*, firms named after their founder(s)) owners choose to explicitly attach their identity to the firm's name. This provides managers of eponymous firms with long-term incentives to have more resilient organizations that perform better and may survive better through crises. We re-estimate our main analysis after including a control for eponymy and find that the eponymy variable is inversely associated with risk disclosure, in line with the notion that higher resilience of these firms has a positive effect on managers' sentiment about future firm prospects. Furthermore, we continue to observe that the coefficient on our variable of interest (*i.e.*, family ownership) maintains the same sign and significance level as that reported in the primary test. This implies that family involvement in ownership and managerial positions remains an important and unique feature of family firms above and beyond the resilience of a generic firm.

Finally, we explore whether family firms exhibit a similar trend in risk disclosure when we consider only earnings announcements. Earnings announcements are mandatory press-releases where firms report accounting and non-accounting information about the present and future periods. Thus, this analysis allows us to address the concern that our primary findings that family firms have a lower risk disclosure than nonfamily firms are in fact driven by other firm idiosyncratic events, which might have triggered higher or lower risk disclosure. To this end, we focus on 1,435 earnings announcements released during the sample period (*i.e.*, about 12% of the entire sample) and we continue to observe a negative association between family ownership and narrative tone.

The evidence in this study contributes to the growing literature on organizational resilience of family firms during crisis. This literature documents that the involvement of families in ownership and management positively affects firms' performance during periods of political uncertainty (Amore and Minichilli, 2018), natural disasters (Salvato et al., 2020), and financial crisis (Boubakri et al., 2010; D'Aurizio et al., 2015; Minichilli et al., 2016). More specifically, our study complements Amore et al. (2021) who observe that family firms have better market and accounting performance during pandemic (Amore et al., 2021) due to their higher organizational resilience. We contribute to this growing stream of research by documenting how different ownership characteristics affect also how managers communicate information to stakeholders during a period of high uncertainty.

More in general, this study contributes to the nascent but fast-growing literature on firm's disclosure during the COVID-19 pandemic. Existing research explores the informativeness of firms' disclosures following the COVID-19 pandemic (Hassan et al., 2020; Wang and Xing, 2020a, b; Theile et al., 2020). Other studies examine how firms adapt their financial reporting during the pandemic (Lopatta et al., 2020; Stephany et al., 2020). We add to this literature by examining how the COVID-19 pandemic affects firms' risk disclosure in business narrative.

Finally, we contribute to the ongoing research on textual analysis in financial disclosures (Huang et al., 2014; Davis et al., 2015; Arslan-Ayaydin et al., 2016). Previous studies in the field investigate three aspects: measurement (Li, 2008; Kearney and Liu, 2014), consequences (Henry, 2008; Davis et al., 2012; Price et al., 2012; Jegadeesh and Wu, 2013; Huang et al., 2014), and determinants of firm narrative tone. Our contribution to the literature is to document the role of firm ownership in shaping managerial narrative disclosures.

The rest of the paper is organized as follows. Section 2 contains the background literature and hypothesis development. Section 3 describes the sample and the method, while Section 4

provides the main results. Sections 5 provides additional empirical analyses and Section 6 describes some robustness tests. Section 7 concludes.

2. PRIOR RESEARCH AND HYPOTHESYS

2.1. Socio-Emotional Wealth and Organizational Resilience in Family Firms

One characteristic of family firms is the desire of family owners to preserve the business in the long run to pass it on to future generations (see, for example, Anderson and Reeb, 2003b; Anderson et al., 2003; Miller and Le Breton-Miller, 2006; Villalonga and Amit, 2009; Gómez-Mejía et al., 2011; Berrone et al., 2012). This noneconomic feature is motivated by the desire of family shareholders to preserve their socioemotional wealth (SEW), *i.e.*, the firm's familiness stemming from a strong personal attachment, commitment, and identification with the firm (see, for a review, Gómez-Mejía et al., 2007, 2011 and Berrone et al., 2012). In this regard, prior research shows that family firms can survive and thrive for very long periods of time spanning several generations and, sometimes, even centuries (Miller and Le-Breton Miller, 2005; Bertrand and Schoar, 2006).

Another explanation for family firms' longevity relies on their superior ability to respond to and overcome adversities, such as natural disasters (Salvato et al., 2020), financial crises (Lins et al., 2013), political uncertainties and other turbulent events (Mzid et al., 2019). This superior ability depends on the unique characteristics of family firms' *social capital*, that is the network of relationships possessed by a controlling family, as well as the resources embedded within, available through, and derived from such a network (Adler and Kwon, 2002; Burt, 2005; Arrègle et al., 2007; Carr et al., 2011). Danes et al. (2009) document that the connections among family firm, local community, and government systems enhance family firms' responses to natural disasters. Salvato et al. (2020) observe that, following an earthquake, family firms perform better

than nonfamily firms, especially when multiple family members are involved as owners. D'Aurizio et al. (2015) and Lagaras and Tsoutsoura (2015) suggest that in times of crisis, family ownership reduces the cost of bank debt and improves performance. Amore and Minichilli (2018) document that family firms are more likely than other firms to invest during times of political uncertainty, as they investment preferences are less susceptible of managerial myopia.

Prior research also suggests that family firms can achieve superior resilience through leaner and more agile organizations. They have more flexible internal organizations, diversify less, and have less complicated procedures (Gómez-Mejía al., 2010). These features enable them attaining faster and more effective decisions, especially in adverse circumstances (Taguiri and Davis, 1996; Carney, 2005; De Massis et al., 2013; Bianco et al., 2013). Altogether, prior empirical research has shown that, because of their social capital, family firms are among the most resilient organizations. This feature enables them to confront better exogenous shocks that disrupt entrepreneurial resources, such as a pandemic (Amore et al., 2021), sometimes turning adversities into opportunities (Roux-Dufort, 2007; Williams and Shepherd, 2018; Salvato et al., 2020).

2.2. Family Ownership and Firm Disclosure

An influential strand of research has investigated the relation between family ownership and firm disclosure with mixed evidence. Fan and Wong (2002) find lower Earnings Response Coefficients (ERC) in East Asian firms with family ownership, while Leuz et al. (2003) and Gopalan and Jayaraman (2012) show a negative association between earnings management and family ownership in an international setting. Chen et al. (2008) documents that family ownership of U.S. public corporations is associated with a lower likelihood of voluntary disclosure. In stark contrast, other studies show that family ownership is associated with both increased accounting

quality and frequency of bad news warnings (Wang, 2006; Ali et al., 2007; Ghosh and Tang, 2015). Despite this rich evidence, the effect of ownership characteristics on risk disclosure in business narrative during uncertain times remains largely unexplored. In the next paragraph, we argue how and to what extent family ownership affects risk disclosure during a pandemic.

2.3. Family Ownership and Risk Disclosure during the COVID-19 Pandemic

Family shareholders are actively involved in the business (Shleifer and Vishny, 1986; Anderson and Reeb, 2003a; Weber et al., 2003) and often control key senior management positions (Anderson and Reeb, 2003a). This implies that, compared to diffusely owned firms, family firms exhibit a lower separation between ownership and control (La Porta et al., 1999). Therefore, family members are more directly involved in financial and non-financial reporting decisions (Wang, 2006; Gómez-Mejía et al., 2014). These arguments provide the mechanism through which family shareholders affect more directly firm disclosure, and in particular risk disclosure.

As said above, the spread of the COVID-19 pandemic has brought about an unprecedented increase in economic risk and uncertainty (Baker et al., 2020a; Baker et al., 2020b). The introduction of massive national lockdowns and the sudden disruption of firm's operational capacity and supply chains have led firms and regulators into an unexplored territory with exceptional economic, but also health, and social challenges. Accordingly, because economic uncertainty increases (Altig et al., 2020), firm sentiment in business communication is expected to deteriorate as well. In the first quarter of 2020, it became evident that the COVID-19 pandemic would affect firms, societies, and countries in many ways (McKibbin and Fernando, 2020). Recent estimates show that the adverse effects of the pandemic well exceed those of the

last financial crisis (Deloitte, 2020a; OECD, 2020).[2] In this scenario, as family firms are more resilient than nonfamily firms to weather economic uncertainty, they are better equipped to overcome the pandemic and to be less severely affected (Amore et al. 2021). We expect then family firms will exhibit a lower level of risk disclosure in business communication than nonfamily firms, during the initial COVID-19 outbreak. We ground this prediction in the central role that the preservation of SEW and organizational resilience play in these organizations.

We highlight an important aspect of the hypothesis, however. The alternative hypothesis stems from the risk aversion argument. The long-termism of family firms and the high concentration of family ownership imply that family owners are more likely to focus on risk minimization. Since family firms exhibit a higher degree of risk aversion (*e.g.*, Anderson and Reeb, 2003b; Anderson et al., 2003; Naldi et al., 2007; Gómez-Mejía et al., 2010), family shareholders may be more sensitive to a sudden deterioration of external economic conditions that may jeopardize firm survival. This higher degree of risk aversion in family firms could thus result in a more negative sentiment and thus in a higher level of risk disclosure.

3. METHODOLOGY

3.1. Sample Description

Table 1 reports the sample selection process. We begin by identifying all Western European firms in Datastream: 5,421 companies from 17 countries. We focus on Western Europe since this was the second largest area (after China) to be severely hit by the COVID-19 pandemic. Furthermore, Western European countries are characterized by a considerable number

[2] Albuquerque et al. (2020) asserts that unemployment in the US increased to 10 percent by the end of the 2007-2008 financial crisis, compared to 11 percent in just few weeks during the first months of the COVID-19 pandemic. The International Monetary Fund (IMF) estimated that GDP growth in 2020 has decreased by 4.3 percent in the U.S., 5.3 percent in Japan, and 8.2 percent in Western Europe. This compares to 2.5 percent in the US, 5.4 percent in Japan, and 4.3 percent in Western Europe in 2009.

of family-controlled firms (La Porta et al., 1999; Faccio and Lang, 2002; Franks et al., 2012; Croci et al., 2012), thus representing a suitable setting for our study.

Important for our analysis is the identification of whether a firm has a family/individual as owner. We proceed by retaining firms with available information in Bureau van Dijk (BvD) about their Global Ultimate Owner (GUO) (Faccio et al., 2011). We define ultimate ownership as control of at least 25 percent of voting rights, where this stake is held either directly or indirectly via a chain of control with links all exceeding the 25 percent threshold (Lins et al., 2013).[3] We obtain GUO data for 5,099 firms and we require the GUO to be either a corporate or an individual/family.[4] Applying these filters yields a sample of 3,505 firms. Next, we set the following three screening criteria: *i*) the firm is listed on a Western European stock exchange; *ii*) the firm is covered in Thomson Reuters where we obtain detailed information about the nature of all shareholders and the corresponding percentage of owned shares at the end of 2019 (before the Pandemic outbreak); *iii*) the firm reports its press releases in English in the investor relations section of its website. Using these criteria, we arrive at a sample of 1,647 firms. We finally retain firms with fiscal year ending on December 31st, 2019 and with no missing data for our variables of interest described below. Our final sample contains 1,433 firms from 17 countries. For these firms, we hand-collect all press releases issued during the period January 1st–May 15th, 2020. We start on January 1st because on this day a novel cluster of pneumonia cases of unknown aetiology was first announced to the World Health Organization (WHO). We stop the analysis in mid-May because from this period onward several jurisdictions started implementing package of support measures for the economy, which may affect the perception of risk and thus confound our

[3] The Bureau van Dijk Electronic Publishing (BvDEP) Ownership Database is a complete source of owner and subsidiary links worldwide.

[4] Orbis provides a classification of the GUO entities. Types include, but are not limited to, "Bank", "Financial company", "Insurance company", "Industrial company", "Public authorities", "One or more known individuals or families", "Employees/managers/directors".

results.[5] Moreover, May 15th is the last available day to release financial results for the first quarter.[6]

We hand-collect a sample of 12,030 press releases, an average of 8.39 press releases per firm. Table 2 Panel A shows the distribution of firms and press releases by country. Family firms are about 35% of the sample (=510/1,433) and their press releases, on average, account for about 30% of all press releases (=3,567/12,030). Consistent with prior evidence, family firms are prevalent in Continental European countries, such as Italy (59.35%), Germany (53.33), France (42.15), Austria (46.15), and Switzerland (43.24) (Faccio and Lang, 2002; Franks et al., 2012). Table 2 Panel B provides the distribution of firms and press-releases by industry. Family firms are more common in consumer discretionary (44.34), utilities (41.38) and financial sector (60.00), where they also tend to disclose more information (55.07). These differences underlie the importance of controlling for country and industry effects in the regression analysis.

Insert Table 1 and Table 2 about here

3.2 Variables and method

Dependent variables **(Measuring risk disclosure)**. To measure risk disclosure, we apply the *bag-of-words* technique in Loughran and McDonald (2016). We proceed as follows: first, we use Thomson Reuters and firms' investor relations websites to hand-collect all press releases. The press-releases we hand-collect refer to: *i*) annual earnings announcements for year 2019; *ii*) the first 2020 quarter announcements; *iii*) other business events. Press releases in PDF format are converted into text files.

[5] For example, on May 27th 2020, in response to COVID-19 crisis, the European Commission (EC) proposed the temporary recovery instrument NextGenerationEU of €750 billion, as well as targeted reinforcements to the long-term EU budget for 2021-2027.
[6] A similar period is also used in Larcker et al. (2020).

Next, we develop a Perl code that counts the number of words associated with a risk-related sentiment and scale it by the total number of words in the document. Finally, we construct three risk disclosure measures. The first measure (*Risk*) aims at capturing managers' perceived risk, the second (*Uncertainty*) purports to catch managers' perceived uncertainty, and the third measure (*Weak Modal*) is a proxy for the number of weak modal words. Weak modals are words that convey a sentiment of hesitancy and dubiety.[7] For the variable *Risk*, we refer to the list of risk-related words in Kravet and Muslu (2013),[8] while for the variables *Uncertainty* and *Weak Modal*, we use the bag of words in Loughran and McDonald lists (2011; 2014; 2016), which have become widely used in recent studies (Kearney and Liu, 2014).[9] [10] Appendix 1 reports the list of words used to constructs our three variables of risk disclosure.

Independent variables. Our independent variable is *FamilyGUO*, an indicator that is equal to 1 if the GUO is an individual or a family, 0 otherwise. Following previous literature, we define a firm as having a family GUO if a family or an individual is the largest ultimate owner with at least 25 percent of firm shares in terms of voting rights (Andres, 2008; Franks et al., 2012; Lins et al., 2013).

Control variables. We use a battery of control variables that may affect risk disclosure. We consider whether there are institutional investors, because previous studies document that they may affect firms' communication with market participants (Shalev, 2009; Boone and White, 2015; Bird and Karolyi, 2016; Abramova et al., 2020). Regardless of their nature, transient,

[7] Loughran and McDonald (2016) assert that firms might unintentionally use more weak modal words (*e.g.*, may, could, and might) to possibly signal concerns about the future.
[8] Differently from previous literature (Li, 2006; Campbell et al., 2014), Kravet and Muslu (2013) consider a risk-related disclosure measure based on a count of sentences that contain the key words, rather than the count of the single words. However, they also state that in their study words and sentences counts are highly correlated. Therefore, we adopt the bag-of-words approach.
[9] Loughran and McDonald (2011) consider six different word lists: negative, positive, uncertainty, litigious, strong modal, and weak modal. A list for "risk" is not provided. Therefore, for the variable "*Risk*", we rely on Kravet and Muslu.
[10] We use the bag-of-words on the following website: https://sraf.nd.edu/textual-analysis/resources/#LM%20Sentiment%20Word%20Lists, updated in March 2019.

quasi-indexer, or dedicated, the investment horizon of these investors is typically shorter than that of family shareholders (Bushee, 1998; Anderson and Reeb, 2003a; Kaplan and Schoar, 2005; Villalonga and Amit, 2006). As such, institutional investors may be more sensitive to the expected negative consequences of the pandemic on economic performance. Therefore, their presence may be associated with a higher level of risk disclosure. We create a dummy variable (*InstInv*) that equals to 1 if there is at least one institutional investor with at least 5 percent of the firm shares, 0 otherwise.[11]

Prior literature indicates that the firm's tone is determined by multiple factors, such as the characteristics of a firm business environment (Li, 2010; Luo and Zhuo, 2020). To capture business environment, we employ the following variables: *Size*, measured as the logarithm of total assets; *Age*, computed as natural logarithm of the difference between year 2019 and the firm's year of foundation; *ROA* (Return on Assets), measured as net income over the average of last and current year total assets. Large, older, and better performing firms may exhibit a lower level of risk disclosure during a pandemic, as they are inherently more resilient.

Next, we include the variable *Market to Book*, measured as the logarithm of market value plus long-term financial debts over firm total assets. High market-to-book firms have higher growth potential and investment opportunity sets before the pandemic. Thus, they may be more severely affected by the shock and exhibit a higher level of risk disclosure. We also control for operational complexity using *Business Segments* and *Geographical Segments* (Li, 2008; Huang et al., 2014). A larger number of segments allow firms to diversify more their production and supply chains during the pandemic. This implies that they can weather better the nefarious consequence of the pandemic and thus exhibit a lower level of risk disclosure in business

[11] In prior literature, 5 percent is commonly recognized as the typical threshold to identify a block-holder (Thomsen et al., 2006; Bebchuk and Jackson, 2012; Dou et al., 2018).

communication.

We use the variable *EarnVol* to control for performance volatility, measured as the standard deviation of firm income, over a 5-year window. Risk disclosure of firms with more volatile business environments in the pre-pandemic period is presumably more negative as the pandemic is expected to exacerbate their pre-existing level of uncertainty. Following Davis and Tama-Sweet (2012), we control for *Leverage*, computed as long-term interest-bearing financial debts over total assets, and *Accruals*, measured as income minus net cash flow from operations over total assets. Also, we control for M&A announcements, as it is possible that a major event, such as a forthcoming M&A, might affect the level of risk disclosure (Shalev, 2009; Huang et al., 2014; Davis et al., 2015). For this purpose, we use the variable *M&A* that equals to 1 if the firm has announced at least one M&A deal during the sample period, 0 otherwise.

Finally, we control for governmental responses to the pandemic. As the pandemic was progressing in the first quarter of 2020, national regulators introduced unprecedented containment and closure policies, such as regional or national lockdowns (see Figure 1). The more stringent were these measures, the higher the increase in economic uncertainty, as the extent of the structural damage to the economy became less predictable. Using the Oxford COVID-19 Government Response Tracker (OxCGRT), we include the variable *Stringency Index*. This index is computed daily and takes on a value between 0 and 100 based on the average of nine indicators that record daily information on various containment measures such as school closures and restrictions in movement.[12] We winzorize all nonbinary variables at 1st and 99th percentile. All variables are defined in detail in Appendix 2.

Insert Figure 1 about here

[12] For detailed information about the calculation of the stringency index and full dataset, please refer to the following link: https://covidtracker.bsg.ox.ac.uk.

We test our hypothesis (*i.e.*, family firms exhibit a lower level of risk disclosure in business disclosure following the COVID-19 pandemic outbreak) using an ordinary least squares regression model on a panel data, with industry and country fixed effects. We cluster errors at the firm level. The model is as follows:

$$Risk\_Discl_{,it} = \beta_0 + \beta_1 FamilyGUO_i + \sum_j \beta_j Controls_j + Industry\ FE + Country\ FE + \varepsilon$$

where *Risk_Discl* takes on the value of the three dependent variables *Risk*, *Uncertainty*, and *Weak Modal*. According to our prediction, we expect a negative coefficient estimate, β_1, on *FamilyGUO*, *i.e.*, family firms exhibit a lower level of risk disclosure in business communication during the pandemic.

4. EMPIRICAL RESULTS

4.1. Descriptive statistics

Table 3 reports the descriptive statistics for the variables used in Equation (1), separately for family and nonfamily firms. The univariate analysis indicates substantial differences in risk disclosure across the two groups. The mean and median of the three risk disclosure variables, *Risk*, *Uncertainty*, and *Weak Modal* are lower for family firms than for nonfamily firms, thus providing initial support for the hypothesis. In line with prior findings, family firms have also fewer institutional investors, exhibit a lower level of accruals, book to market, and M&A activity. However, they are more levered, older, larger in size, have more business segments, and perform better than nonfamily firms. Therefore, it is important to control for these factors, because they could drive the relation between *FamilyGUO* and *Risk_Discl*.

Insert Table 3 about here

Table 4 provides the correlation matrix for the variables in Equation (1). The three risk disclosure variables are positively and statistically significantly correlated. We note a few insights. First, our ownership variables exhibit a different correlation with the three variables: a negative correlation with *FamilyGUO* and a positive correlation with *InstInv*. While the former result is congruent with the hypothesis, the latter result supports it, indicating that institutional investors may be more sensitive to the uncertainty of a pandemic, and thus, due to their lower resilience and shorter investment horizon, they are more concerned about the economic implication of the shock.

Second, there is a positive correlation between *EarnVol*, *Stringency* and the risk disclosure measures, indicating that more stringent measures imposed by regulators are associated with a higher level of concern about the economic consequences of the pandemic, and thus with a higher level of risk disclosure. Finally, there is a negative correlation between *Age*, *ROA*, *Size, Business Segments, Geographic Segments*, and risk disclosure. This result suggests that older, better performing, larger, and more diversified firms are more stable (resilient), and thus they are relatively less concerned about the pandemic effects on their economic performance.

Insert Table 4 about here

In Figure 3, we depict the time-series trend in the three risk disclosure variables (Panel A - *Risk*, Panel B - *Uncertainty*, and Panel C - *Weak Modal*) both for family and nonfamily firms during the first 20 weeks of year 2020 (*i.e.*, January 1st–May 15, 2020). Figure 3 offers two insights. First, risk disclosure in press releases increases during the period, both for family and

nonfamily firms; the increase becomes more pronounced after the 10th week, corresponding to March 10th, 2020, which coincides with the introduction of total lockdowns in Italy, the first Western European country hit by the pandemic. Second, the overall increase in risk disclosure for family firms is smaller than that of nonfamily firms. In the first 20 weeks of year 2020, nonfamily firms increase risk disclosure by 66.67 percent (= 0.10/0.06) for *Risk*, 201.81 percent (=0.111/0.055) for *Uncertainty*, and 222.58 percent (=0.069/0.031) for *Weak Modals* vs. 43.18 percent (=0.063/0.044), 18.33 percent (=0.071/0.060), and 60 percent (=0.048/0.030) for family firms, respectively.

Insert Figure 3 about here

4.2. Multivariate analysis

Table 5 provides the regression estimates of Equation (1). For each risk disclosure variable, we first perform a reduced form of Equation (1), where we only include the independent variable *FamilyGuo* and fixed effects. Column (1), (3), and (5) show a negative association between *FamilyGUO* and the three proxies of risk disclosure: *Risk* (-0.010), *Uncertainty* (-0.010), and *Weak Modals* (-0.005) (all coefficients are statistically significant at less than 1 percent level). The results continue to hold, both economically and statistically, when we add the control variables. Among the control variables, we observe that the variable *InstInv* remains positively associated with risk disclosure. This result suggests that the prevalence of less resilient, short-term oriented investors is associated with more negative economic expectations ensuing the pandemic, which ultimately translates into a higher level of risk disclosure.

The other coefficients on the control variables in our regression suggest that firms tend to use a lower level of risk disclosure if they are older and operate in more business segments. In contrast, firms use a higher level of risk disclosure if they are operating in more volatile business

environments and have higher growth expectations pre-pandemic. We also observe that firms operating in countries with more severe containment measures report a higher level of risk disclosure in business communication, possibly because they expect to be economically hit more severely by the pandemic. In summary, these results suggest that, at the outset of the pandemic outbreak, family firms used a lower level of risk disclosure in business communication than nonfamily firms, and this supports the hypothesis.

Insert Table 5 about here
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5. ADDITIONAL ANALYSIS

In an additional analysis, we examine the cross-sectional effect of CEO characteristics on risk disclosure during pandemic. CEOs hold the most power within the company (Andrews, 1987) and those who fail to meet their voluntary disclosures may damage their reputation and the firm image (Ferreira and Rezende, 2007), thus leading to investors' confidence loss (Graham et al., 2005). Optimistic disclosure tone increases attention and litigation risk (Rogers et al., 2011) and, in the event of an unprecedented market downturn, this risk might be exacerbated. For young CEOs, who face more stringent market monitoring, a plausible strategy may be to keep a high level of risk disclosure to avoid increased market scrutiny (Pan et al., 2015). On the contrary, more senior CEOs have higher ability and a better knowledge about the firm. Thus, they are expected to use a more optimistic (or lower risk) disclosure tone to show their higher managerial qualities to face uncertainty (Garcìa-Osma et al., 2018). This argument, however, may be different for family firms. Prior literature on family firms documents that the positive effect of family ownership on economic performance is generally attributable to first-generation CEOs (Anderson et al., 2003; Villalonga and Amit, 2006). This result suggests that older CEOs

of family firms, who are more likely to leave soon, might be more worried about the long-term negative economic effects of the pandemic on their firms' performance, as they fear that subsequent-generation CEOs might be less qualified to steer the company through the crisis. Therefore, we expect that older CEOs in family firms use a higher level of risk disclosure in business communication during the pandemic.

An additional CEO characteristic affecting risk disclosure is gender. Previous studies suggest that female managers are more risk averse than their male counterparts. Francis et al. (2015) report that female CFOs are more conservative in the accruals management, and Ho et al. (2015) present similar conclusions, however, for female CEOs. Consequently, we expect that female managers use a higher level of risk disclosure than male managers in business narrative (Davis et al., 2015; Marquez-Illescas et al., 2019), and we also explore whether this effect is more pronounced in family firms vs. non-family firms.

We augment our specification in Equation (1) with two additional variables: 1) *CEO_Old*, a dummy that equals 1 if the CEO age is larger than the median CEO's age, and 0 otherwise; and 2) *CEO_Gender*, an indicator that equals 1 if the CEO is a woman, and 0 otherwise. The median CEO's age is 53 years, while only 5 percent of the sample firms have a female CEO.

Consistent with existing insights, the results in Table 6 show a statistically positive relation between *FamilyGUO* × *CEO_Old* and our three proxies of risk disclosure, while we find no statistically significant difference in risk disclosure between senior and junior CEOs in non-family firms. The coefficients on *FamilyGUO* continue to be negative and significant at statistical conventional levels in all models, in line with the hypothesis. Overall, this result suggests that more senior CEOs of family firms, who are closer to experience a succession event, tend to exhibit a relatively higher level of risk disclosure during the pandemic, since they are

afraid that a descendant family CEOs may not have the necessary skills to overcome the adverse economic implications of the pandemic on firm's economic performance.

We do not find any significant difference in risk disclosure across male and female CEO in non-family firms, nor we observe that this effect is different in family firms. This latter result could be attributed to the lack of statistical power.

Insert Table 6 about here

Prior studies suggest that eponymy (*i.e.*, naming a firm after its founders) is associated with higher reputation concerns and this provides a positive disciplining mechanism for firm performance and financial reporting quality (Belenzon et al., 2017; Minichilli et al., 2021). Because the owners of eponymous firms choose to explicitly attach their identity to the firm's name, we expect that they have more incentives to preserve their firm and have also more resilient organizations to ensure the firm's long-term survival (Belenzon et al., 2020). To further validate our hypothesis, we include the variable *Eponymous* in Equation (1). We define a firm as eponymous if the entire last name or the initials of the first and last name of the founder(s) or a member of his family by blood or marriage are included in the firm's name, 0 otherwise (Minichilli et al., 2021). On average, 10.7 percent of companies in the sample are eponymous. The results in Table 7 show that the *Eponymous* variable has a negative and significant association with the three proxies of risk disclosure. The coefficients are similar in magnitude to the coefficients on *FamilyGUO*, which continue to be negatively associated with risk disclosure in all models, as hypothesized. Overall, this result validates the arguments supporting the hypothesis.

Insert Table 7 about here

We perform a third analysis to examine whether the difference in risk disclosure between family firms and non-family firms is attributable to the distinct family firms' attitude towards sudden negative shocks, as highlighted in the hypothesis. To this end, we select a random sample of 622 firms (from our 1,433 firms). For each of these 622 firms, we use all press releases issued during the same period, January 1st–May 15th, in the previous year (2019), when there was no pandemic. In total, there are 5,520 press releases, an average of 8.87 press releases per firm. Before turning to the investigation of the relation between family firms and risk disclosure before the pandemic, we first examine whether this subsample of 622 firms exhibits the negative association with risk disclosure documented for the full sample in 2020. Untabulated results reveal that the variable *FamilyGUO* has a negative association with our three risk disclosure proxies, with a statistical percentage at less than 10 percent.

In Table 8, we report the results of the analysis for year 2019[13]. The coefficient on *FamilyGUO* is not statistically different from zero in all models. This result indicates that in *normal* times, family firms do not exhibit any difference in risk disclosure compared to nonfamily firms, and this corroborates our hypothesis.

Insert Table 8 about here
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6. ROBUSTNESS ANALYSES

We compute Equation (1) using only earnings announcements press releases for fiscal 2019 and Q1 2020. Earnings announcements are mandatory disclosures, which often convey

[13] For this additional analysis, we omit to include the variable *Stringency* in Equation (1) because there was no pandemic event (*i.e.*, no containment measure was in force) during Jan 1 – May 15, 2019.

other information (besides bottom line earnings), such as past and future operating data (Hoskins et al., 1986; Francis et al., 2002a; 2002b). They also include qualitative comments made by management about future economic prospect. By focusing our analysis on these mandatory disclosures, we aim to corroborate our prior findings (see par. 4) and ensure that they are not driven by other omitted firm-specific characteristics or idiosyncratic events (*i.e.*, the death of a director, the resignation of a CEO) that might affect the quantity and the quality of risk disclosure.

For this analysis, we consider all earnings announcements released from February 29th, when all Western European countries recorded at least one case of COVID-19 infection (see Figure 2) and thus all firms where simultaneously facing a similar negative scenario when releasing an earnings announcement press release. In total, we have 1,435 earnings announcements (*i.e.*, about 12 percecnt of the entire sample). Table 9 reports the results. We find that restricting the analysis to earnings announcements does not alter the tenor of our findings: the variable *FamilyGUO* continues to be negatively and statistically significant between 5 percent and 10 percent (albeit weakly significant in the risk analysis in Column 2), in support of the hypothesis.

Insert Figure 2 and Table 9 about here

We finally perform the analysis excluding firms from regulated industries, such as financial firms, which among all industries were the first to be severely hit during the first wave of the pandemic. Excluding observations from financial industries, all results are inferentially equivalent to those reported in Table 5 (*i.e.*, the estimated coefficients on variables of interest are similar in magnitude and have similar significant test statistics).

7. CONCLUSIONS

The paper investigates whether, compared to nonfamily firms, family firms use a different level of risk disclosure in response to the events caused by the outbreak of the COVID-19 pandemic. Using a sample of 12,030 press releases of 1,433 firms from 17 Western European countries, we find that family firms are inclined to use a lower level of risk disclosure. Our results are robust to controls for firm operating-, CEOs-characteristics (ability and gender) and firm's reputation concerns (eponymy). The findings continue to hold even when we consider only earnings announcement press releases. Altogether our findings are consistent with the notion that family firm's long-term horizon and organizational resilience improve their confidence in copying with the adverse consequences of the pandemic, which translates in a lower risk disclosure in business communication.

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FIGURES

Figure 1. Trend in Stringency Measures around COVID-19 breakout in Western European countries

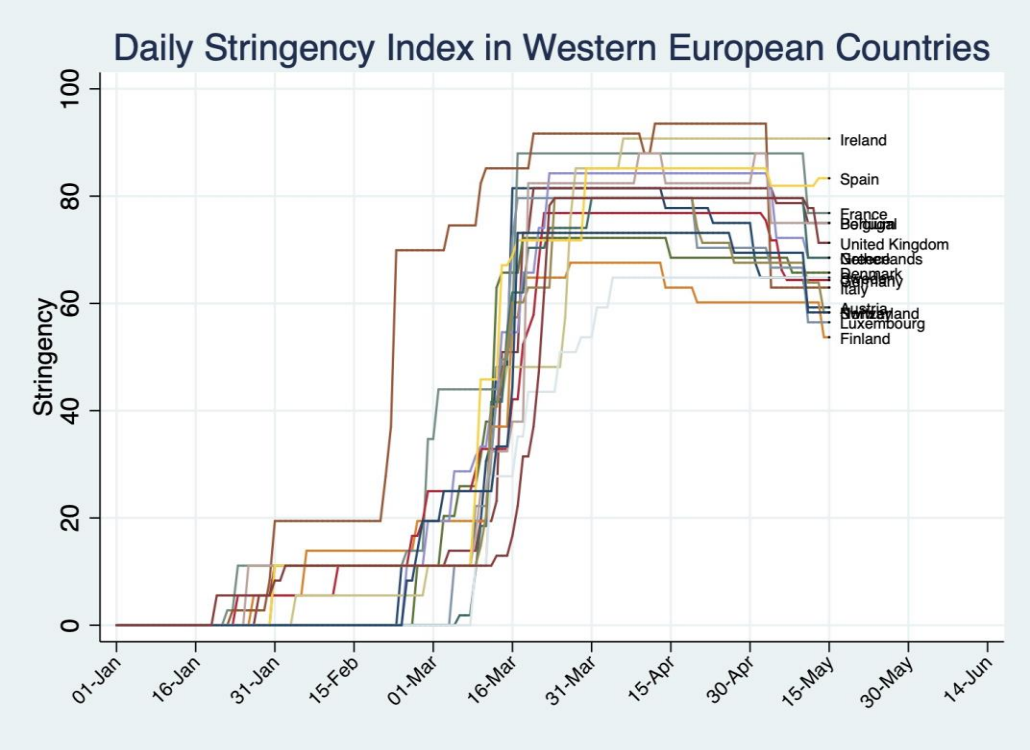


Figure 2. Spread of COVID-19 infections in Western European countries

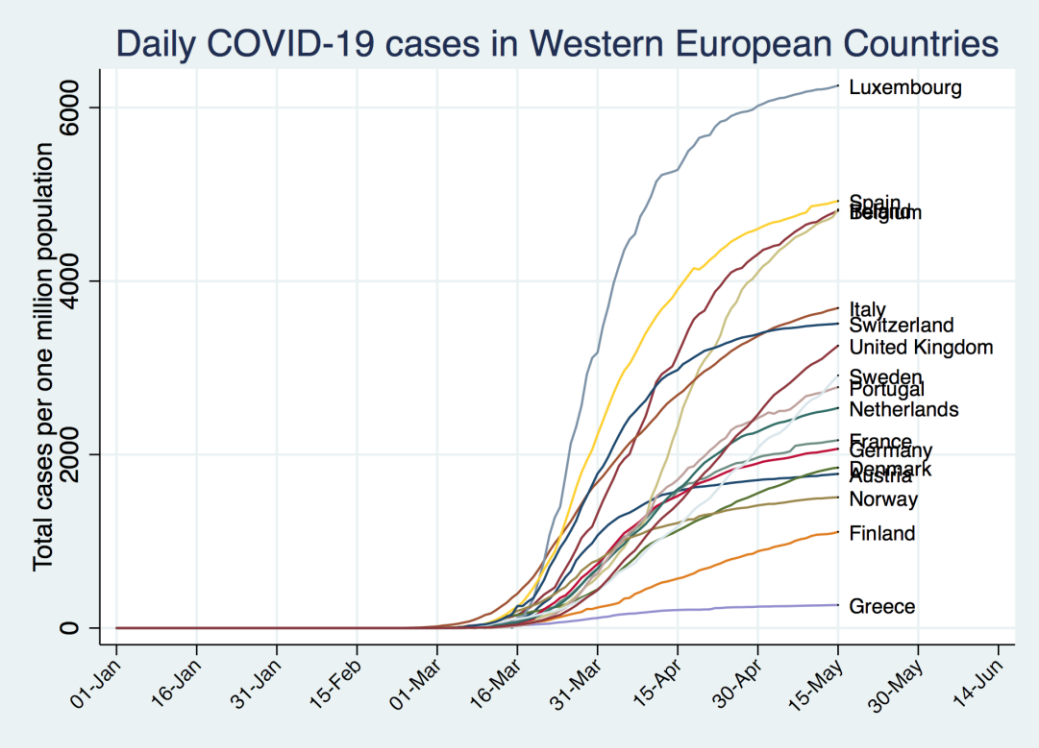


Figure 3. Panel A – Risk Tone in Family vs. Family vs. Nonfamily firms

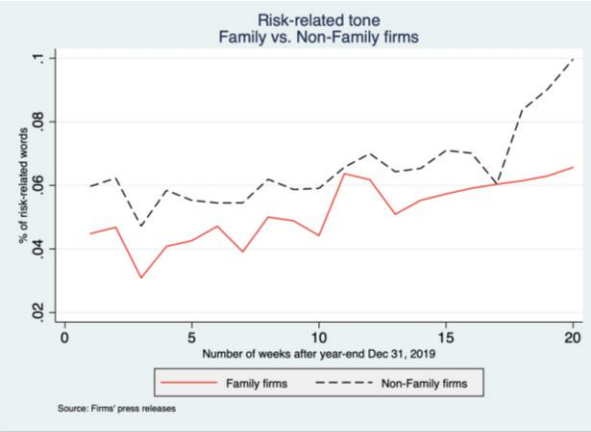


Figure 3. Panel B – Uncertainty Tone in Nonfamily firms

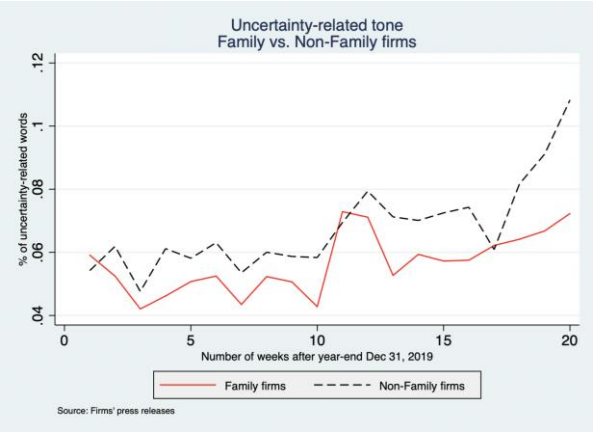
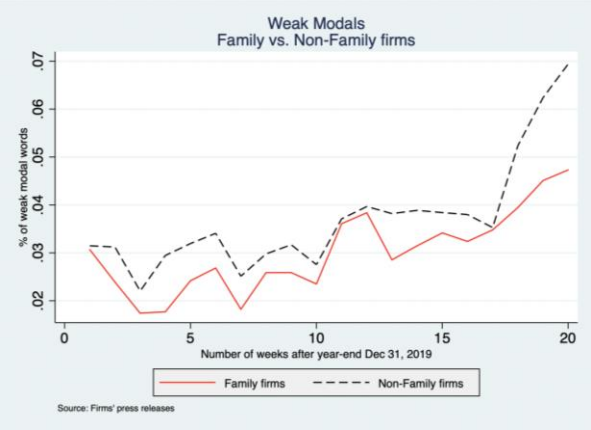


Figure 3. Panel C – Weak Modals in Family vs. Nonfamily Firms



APPENDICES

Appendix 1. Bag of Words

Risk Keywords (Kravet and Muslu, 2013)						
Affect	Depend*	Hedg*	May	Potential*	Susceptible	
Can/cannot	Expos*	Influenc*	Might	Risk*	Uncertain*	
Could	Fluctuat*	Likely to	Possibl*	Subject to	Vary*/varies	
Uncertainity Keywords (Loughran and McDonald, 2016)						
Abeyance	Believing	Doubtful	Precaution	Recalculating	Sporadic	Unpredicted
Abeyances	Cautious	Doubts	Precautionary	Recalculation	Sporadically	Unproved
Almost	Cautiously	Exposure	Precautions	Recalculations	Sudden	Unproven
Alteration	Cautiousness	Exposures	Predict	Reconsider	Suddenly	Unquantifiable
Alterations	Clarification	Fluctuate	Predictability	Reconsidered	Suggest	Unquantified
Ambiguities	Clarifications	Fluctuated	Predicted	Reconsidering	Suggested	Unreconciled
Ambiguity	Conceivable	Fluctuates	Predicting	Reconsiders	Suggesting	Unseasonable
Ambiguous	Conceivably	Fluctuating	Prediction	Reexamination	Suggests	Unseasonably
Anomalies	Conditional	Fluctuation	Predictions	Reexamine	Susceptibility	Unsettled
Anomalous	Conditionally	Fluctuations	Predictive	Reexamining	Tending	Unspecific
Anomalously	Confuses	Hidden	Predictor	Reinterpret	Tentative	Unspecified
Anomaly	Confusing	Hinges	Predictors	Reinterpretation	Tentatively	Untested
Anticipate	Confusingly	Imprecise	Predicts	Reinterpretations	Turbulence	Unusual
Anticipated	Confusion	Imprecision	Preliminarily	Reinterpreted	Uncertain	Unusually
Anticipates	Contingencies	Imprecisions	Preliminary	Reinterpreting	Uncertainly	Unwritten
Anticipating	Contingency	Improbability	Presumably	Reinterprets	Uncertainties	Vagaries
Anticipation	Contingent	Improbable	Presume	Revise	Uncertainty	Vague
Anticipations	Contingently	Incompleteness	Presumed	Revised	Unclear	Vaguely
Apparent	Contingents	Indefinite	Presumes	Risk	Unconfirmed	Vagueness
Apparently	Could	Indefinitely	Presuming	Risked	Undecided	Vaguenesses
Appear	Crossroad	Indefiniteness	Presumption	Riskier	Undefined	Vaguer
Appeared	Crossroads	Indeterminable	Presumptions	Riskiest	Undesignated	Vaguest
Appearing	Depend	Indeterminate	Probabilistic	Riskiness	Undetectable	Variability
Appears	Depended	Inexact	Probabilities	Risking	Undeterminable	Variable
Approximate	Dependence	Inexactness	Probability	Risks	Undetermined	Variables
Approximated	Dependencies	Instabilities	Probable	Risky	Undocumented	Variably
Approximately	Dependency	Instability	Probably	Roughly	Unexpected	Variance
Approximates	Dependent	Intangible	Random	Rumors	Unexpectedly	Variances
Approximating	Depending	Intangibles	Randomize	Seems	Unfamiliar	Variant
Approximation	Depends	Likelihood	Randomized	Seldom	Unfamiliarity	Variants
Approximations	Destabilizing	May	Randomizes	Seldomly	Unforecasted	Variation
Arbitrarily	Deviate	Maybe	Randomizing	Sometime	Unforseen	Variations
Arbitrariness	Deviated	Might	Randomly	Sometimes	Unguaranteed	Varied
Arbitrary	Deviates	Nearly	Randomness	Somewhat	Unhedged	Varies
Assume	Deviating	Nonassessable	Reassess	Somewhere	Unidentifiable	Vary
Assumed	Deviation	Occasionally	Reassessed	Speculate	Unidentified	Varying
Assumes	Deviations	Ordinarily	Reassesses	Speculated	Unknown	Volatile
Assuming	Differ	Pending	Reassessing	Speculates	Unknowns	Volatilities
Assumption	Differed	Perhaps	Reassessment	Speculating	Unobservable	Volatility
Assumptions	Differing	Possibilities	Reassessments	Speculation	Unplanned	
Believe	Differs	Possibility	Recalculate	Speculations	Unpredictability	
Believed	Doubt	Possible	Recalculated	Speculative	Unpredictable	
Believes	Doubted	Possibly	Recalculates	Speculatively	Unpredictably	
Weak Modals Keywords (Loughran and McDonald, 2016)						
Almost	Appears	Depended	Maybe	Perhaps	Seldomly	Suggests
Apparently	Conceivable	Depending	Might	Possible	Sometimes	Uncertain
Appeared	Could	Depends	Nearly	Possibly	Somewhat	Uncertainly
Appearing	Depend	May	Occasionally	Seldom	Suggest	

Notes: This table shows bags-of-words used in main, additional and robustness analyses.
* Suffixes are allowed.

Appendix 2. Variable Description

Main Analysis		
Accruals	Firm income before extraordinary items and preferred dividends minus net cash flow from operations over total assets.	Datastream (WC01551 – WC04860) / WC02999
Age	Natural logarithm of age, calculated as the difference between the current year and the firm year of foundation.	Orbis
Bus_Segments	Total number of business segments.	Datastream WC19506
EarnVol	Standard deviation of income before extraordinary items and preferred dividends, over a 5-years window.	Datastream WC01551
FamilyGUO	Dummy variable that equals 1 if the global ultimate owner is an individual or a family and owns at least 25 percent of voting right, 0 otherwise.	Orbis
Geo_Segments	Total number of different geographic segments.	Datastream WC19600
InstInv	Dummy variable that equals 1 if there is at least one institutional investor that owns at least 5 percent of shares, 0 otherwise.	Thomson
Leverage	Long-term interest-bearing financial debts over total assets.	Datastream WC03251 / WC02999
M&A	Dummy variable that equals 1 if the firm has announced at least one M&A deal, and 0 otherwise.	Zephyr
MTB	Natural logarithm of market value plus long-term financial debts over total assets.	Datastream (MV + WC03251) / WC02999
Risk	Number of risk-related words over total number of words in press release. The bag of risk-related words is in Kravet and Muslu, 2013.	Press Release
ROA	Net income over the average of last and current year total assets.	Datastream WC08326
Size	Natural logarithm of firm total assets.	Datastream WC02999
Stringency	Natural logarithm of the Oxford COVID-19 Government Response Tracker (OxCGRT) stringency index.	University of Oxford
Uncertainty	Number of uncertainty-related words over total number of words in the press release. The bag of uncertainty-related words is in Loughran and McDonald, 2011.	Press Release
Weak Modals	Number of weak modal words over total number of words in the press release. The bag of weak modal words is in Loughran and McDonald, 2011.	Press Release
Additional Analysis		
CEO_Old	Dummy that equals 1 if the CEO age is larger than the median CEO's age, 0 otherwise.	Hand Collected
CEO_Gender	Dummy variable that equals 1 if the CEO is a woman, 0 otherwise.	Hand Collected
Eponymous	Dummy variable that equals 1 if the entire last name or the initials of the first and last name of the founder(s) or a member of his family by blood or marriage are included in the firm's name, 0 otherwise.	Hand Collected

Notes: This table shows variables used in main, additional and robustness analyses.

TABLES

Table 1. Sample Selection

Initial sample: European listed firms on Datastream in May 2020		5,421
Less: Missing Global Ultimate Owner (GUO) data on Orbis		322
	Remaining	5,099
Less: Firms with GUO that is not a corporate or a family/individual		1,594
	Remaining	3,505
Less: Firms traded outside Western Europe		280
	Remaining	3,225
Less: Firms with missing shareholder data in Thomson Reuters		912
	Remaining	2,313
Less: Firms with missing press releases or press releases not in English		666
	Remaining	1,647
Less: Firms with fiscal year end other than 31/12/2019 and missing data for the variables of interest		214
Firms		1,433
Press releases		12,030

Notes: This table shows the selection criteria to arrive to the final sample.

Table 2. Panel A – Firms and Press Releases by Country

	Firms			Press Releases		
	Family	NonFamily	% Family	Family	NonFamily	% Family
Austria	6	7	46.15	43	35	55.13
Belgium	17	33	34.00	145	289	33.41
Denmark	9	22	29.03	68	201	25.28
Finland	10	66	13.16	98	666	12.83
France	94	129	42.15	463	885	34.35
Germany	104	91	53.33	383	480	44.38
Greece	18	13	58.06	101	75	57.39
Ireland	0	8	0.00	0	31	0.00
Italy	73	50	59.35	512	548	48.30
Luxembourg	0	2	0.00	0	15	0.00
Netherlands	12	19	38.71	84	123	40.58
Norway	24	53	31.17	310	747	29.33
Portugal	5	5	50.00	28	39	41.79
Spain	14	29	32.56	97	322	23.15
Sweden	45	153	22.73	503	1,540	24.62
Switzerland	32	42	43.24	214	306	41.15
United Kingdom	47	201	18.95	518	2,161	19.34
Total	510	923	35.59	3,567	8,463	29.65

Notes: This table shows the distribution of firms and press releases by firm's country of origin.

Table 2. Panel B – Firms and Press Releases by Industry

	Firms			Press Releases		
	Family	NonFamily	% Family	Family	NonFamily	% Family
Basic Materials	30	66	31.25	221	589	27.28
Consumer Discretionary	94	118	44.34	501	947	34.60
Consumer Staples	22	48	31.43	162	466	25.80
Energy	21	50	29.58	191	575	24.93
Financials	39	26	60.00	277	226	55.07
Health Care	44	144	23.40	403	1,262	24.20
Industrials	127	210	37.69	831	1,929	30.11
Real Estates	38	59	39.18	286	448	38.96
Technology	64	144	30.77	503	1,271	28.35
Telecommunications	19	41	31.67	114	444	20.43
Utilities	12	17	41.38	78	306	20.31
Total	510	923	35.59	3,567	8,463	29.65

Notes: This table shows the distribution of firms and press releases by firm's two-digits ICB code industry classification.

Table 3. Descriptive Statistics

VARIABLES	Family = 510 firms				NonFamily = 923 firms				Diff.	Diff.
	N	Mean	Median	Std. Dev.	N	Mean	Median	Std. Dev.	in mean	in median
Risk	3,567	0.046	0.027	0.057	8,463	0.058	0.034	0.082	8.281	7.234
Uncertainty	3,567	0.049	0.029	0.061	8,463	0.061	0.035	0.089	7.376	5.854
Weak Modals	3,567	0.027	0.013	0.037	8,463	0.033	0.016	0.053	6.832	4.657
InstInv	3,567	0.468	0.000	0.499	8,463	0.663	1.000	0.473	20.335	19.995
Accruals	3,567	–0.079	–0.052	0.192	8,463	–0.067	–0.051	0.110	4.238	2.146
Size	3,567	13.234	13.102	2.266	8,463	13.033	12.944	2.510	–4.135	–5.129
Leverage	3,567	0.319	0.303	0.224	8,463	0.270	0.255	0.194	–12.208	–11.002
Age	3,567	3.373	3.332	0.898	8,463	3.219	3.178	0.952	–8.236	–8.118
MTB	3,567	0.228	0.058	0.832	8,463	0.274	0.136	0.684	3.130	7.211
Bus_Segments	3,567	3.561	3.000	2.379	8,463	3.484	3.000	2.457	–1.579	–0.800
Geo_Segments	3,567	3.588	3.000	2.213	8,463	3.346	3.000	2.217	–5.478	–6.157
ROA	3,567	–0.025	0.037	0.300	8,463	–0.048	0.031	0.243	–4.366	–8.649
EarnVol	3,567	9.652	9.568	1.815	8,463	9.638	9.333	1.995	–0.342	–1.678
M&A	3,567	0.125	0.000	0.330	8,463	0.165	0.000	0.371	5.600	5.593
Stringency	3,567	3.203	4.127	1.666	8,463	3.037	3.850	1.719	–4.887	–7.042

Notes: This table shows descriptive statistics of variables used in the main analysis.

Table 4. Correlation Matrix

VARIABLES	*Risk*	*Uncertainty*	*Weak Modals*	*Family GUO*	*InstInv*	*Accruals*	*Size*	*Leverage*	*Age*	*MTB*	*Bus_ Segments*	*Geo_ Segments*	*ROA*	*EarnVol*	*M&A*	*Strin.cy*
Risk	1.000															
Uncertainty	0.857***	1.000														
Weak Modals	0.823***	0.834***	1.000													
FamilyGUO	–0.075***	–0.067***	–0.062***	1.000												
InstInv	0.072***	0.061***	0.068***	–0.182***	1.000											
Accruals	–0.018*	–0.011	–0.019**	–0.039***	–0.011	1.000										
Size	–0.016*	–0.016*	–0.018*	0.038***	0.026***	0.240***	1.000									
Leverage	–0.011	–0.006	0.001	0.111***	–0.011	–0.207***	0.217***	1.000								
Age	–0.070***	–0.076***	–0.061***	0.075***	–0.061***	0.050***	0.405***	0.031***	1.000							
MTB	0.078***	0.079***	0.064***	–0.029***	0.113***	–0.230***	–0.383***	–0.047***	–0.168***	1.000						
Bus_Segments	–0.037***	–0.044***	–0.034***	0.014	0.109***	0.134***	0.561***	0.132***	0.337***	–0.207***	1.000					
Geo_Segments	–0.065***	–0.058***	–0.068***	0.050***	–0.054***	0.136***	0.400***	0.028***	0.435***	–0.206***	0.417***	1.000				
ROA	–0.076***	–0.084***	–0.061***	0.040***	0.019**	0.550***	0.484***	–0.076***	0.230***	–0.324***	0.336***	0.300***	1.000			
EarnVol	0.046***	0.033***	0.017*	0.003	0.048***	0.082***	0.839***	0.162***	0.329***	–0.272***	0.433***	0.271***	0.247***	1.000		
M&A	–0.001	0.006	0.007	–0.051***	0.092***	0.042***	0.220***	0.005	0.047***	0.055***	0.165***	0.125***	0.160***	0.169***	1.000	
Stringency	0.096***	0.091***	0.134***	0.045***	–0.024***	0.016*	0.031***	0.023**	0.028***	–0.047***	0.020**	0.012	0.030***	0.015*	–0.040***	1.000

Notes: This table shows pairwise correlation between each pair of variables used in the main analysis. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Table 5. Family firms and disclosure tone during the pandemic

VARIABLES	(1) Risk	(2) Risk	(3) Uncertainty	(4) Uncertainty	(5) Weak Modals	(6) Weak Modals
FamilyGUO	–0.010***	–0.009***	–0.010***	–0.009***	–0.005***	–0.004***
	(–3.838)	(–3.275)	(–3.579)	(–3.112)	(–2.939)	(–2.671)
InstInv		0.006**		0.006*		0.003*
		(2.185)		(1.864)		(1.729)
Accruals		0.015		0.020		0.008
		(1.190)		(1.358)		(1.063)
Size		–0.001		0.000		0.000
		(–0.518)		(0.276)		(0.587)
Leverage		0.002		0.002		0.002
		(0.326)		(0.270)		(0.460)
Age		–0.003*		–0.005***		–0.001
		(–1.727)		(–2.761)		(–0.982)
MTB		0.004**		0.004**		0.003**
		(2.406)		(2.025)		(2.436)
Bus_Segments		–0.001		–0.001		–0.001*
		(–1.077)		(–1.638)		(–1.705)
Geo_Segments		–0.001		–0.000		–0.001
		(–1.145)		(–0.608)		(–1.335)
ROA		–0.007		–0.014		–0.004
		(–0.725)		(–1.061)		(–0.656)
EarnVol		0.004**		0.003**		0.001
		(2.370)		(2.096)		(0.911)
M&A		0.001		0.002		0.002
		(0.435)		(0.658)		(0.733)
Stringency		0.004***		0.005***		0.004***
		(9.159)		(9.118)		(13.359)
Industry FE	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES
Clusters	1,433	1,433	1,433	1,433	1,433	1,433
Observations	12,030	12,030	12,030	12,030	12,030	12,030
Adj. R^2	4.7%	6.4%	3.8%	5.5%	4.7%	6.8%

Notes: Columns show the results from an OLS regression where the dependent variable in Column (1) and Column (2) is the number of risk-related words scaled by the total number of words in the document; in Column (3) and Column (4) is the number of uncertainty-related words scaled by the total number of words in the document; in Column (5) and Column (6) is the number of weak modal words scaled by the total number of words in the document. All variables are defined in Appendix 2. All models include industry and country fixed effects. Errors are clustered by firm. Standard errors are shown in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Table 6. Family firm, CEO characteristics, and disclosure tone during the pandemic

VARIABLES	(1) Risk	(2) Uncertainty	(3) Weak Modals
FamilyGUO	–0.014***	–0.016***	–0.007***
	(–3.68)	(–3.95)	(–2.91)
CEO_Old	–0.001	–0.004	–0.001
	(–0.32)	(–0.93)	(–0.30)
CEO_Gender	–0.005	–0.000	–0.001
	(–0.75)	(–0.03)	(–0.15)
FamilyGUO × CEO_Old	0.010*	0.015***	0.005*
	(1.92)	(2.79)	(1.68)
FamilyGUO × CEO_ Gender	0.001	–0.008	–0.003
	(0.07)	(–0.67)	(–0.51)
InstInv	0.006**	0.006**	0.003*
	(2.23)	(1.97)	(1.81)
Accruals	0.015	0.019	0.008
	(1.14)	(1.35)	(1.09)
Size	–0.001	0.000	0.000
	(–0.66)	(0.21)	(0.41)
Leverage	0.002	0.001	0.002
	(0.27)	(0.16)	(0.42)
Age	–0.003*	–0.005***	–0.001
	(–1.80)	(–2.79)	(–1.03)
MTB	0.004**	0.004**	0.003**
	(2.38)	(2.03)	(2.39)
Bus_Segments	–0.001	–0.001*	–0.001*
	(–1.20)	(–1.71)	(–1.82)
Geo_Segments	–0.001	–0.000	–0.001
	(–1.09)	(–0.64)	(–1.26)
ROA	–0.006	–0.012	–0.003
	(–0.61)	(–0.96)	(–0.54)
EarnVol	0.004**	0.003**	0.001
	(2.55)	(2.26)	(1.10)
M&A	0.001	0.002	0.002
	(0.38)	(0.61)	(0.71)
Stringency	0.004***	0.005***	0.004***
	(9.08)	(9.05)	(13.26)
Industry FE	YES	YES	YES
Country FE	YES	YES	YES
Clusters	1,394	1,394	1,394
Observations	11,863	11,863	11,863
Adj. R^2	6.5%	5.7%	6.8%

Notes: Columns show the results from an OLS regression where the dependent variable in Column (1) is the number of risk-related words scaled by the total number of words in the document; in Column (2) is the number of uncertainty-related words scaled by the total number of words in the document; in Column (3) is the number of weak modal words scaled by the total number of words in the document. All variables are defined in Appendix 2. All models include industry and country fixed effects. Errors are clustered by firm. Standard errors are shown in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Table 7. Family firms, eponymy, and disclosure tone during the pandemic

VARIABLES	(1) Risk	(2) Uncertainty	(3) Weak Modals
FamilyGUO	–0.009***	–0.009***	–0.004***
	(–3.275)	(–3.150)	(–2.629)
Eponymous	–0.010***	–0.008**	–0.006**
	(–2.658)	(–2.163)	(–2.426)
InstInv	0.006**	0.006*	0.003*
	(2.129)	(1.789)	(1.671)
Accruals	0.014	0.019	0.008
	(1.112)	(1.299)	(1.047)
Size	–0.001	0.000	0.000
	(–0.490)	(0.278)	(0.550)
Leverage	0.001	0.001	0.001
	(0.186)	(0.152)	(0.344)
Age	–0.002	–0.004**	–0.001
	(–1.287)	(–2.396)	(–0.593)
MTB	0.004**	0.004*	0.003**
	(2.316)	(1.926)	(2.327)
Bus_Segments	–0.001	–0.001*	–0.001*
	(–1.220)	(–1.777)	(–1.873)
Geo_Segments	–0.001	–0.000	–0.000
	(–0.947)	(–0.464)	(–1.135)
ROA	–0.007	–0.013	–0.004
	(–0.698)	(–1.023)	(–0.626)
EarnVol	0.004**	0.003**	0.001
	(2.413)	(2.108)	(0.977)
M&A	0.002	0.002	0.002
	(0.452)	(0.665)	(0.761)
Stringency	0.004***	0.005***	0.004***
	(9.097)	(9.024)	(13.233)
Industry FE	YES	YES	YES
Country FE	YES	YES	YES
Clusters	1,394	1,394	1,394
Observations	11,863	11,863	11,863
Adj. R^2	6.6%	5.6%	6.9%

Notes: Columns show the results from an OLS regression where the dependent variable in Column (1) is the number of risk-related words scaled by the total number of words in the document; in Column (2) is the number of uncertainty-related words scaled by the total number of words in the document; in Column (3) is the number of weak modal words scaled by the total number of words in the document. All variables are defined in Appendix 2. All models include industry and country fixed effects. Errors are clustered by firm. Standard errors are shown in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Table 8. Family firms and disclosure tone before COVID-19 pandemic (year 2019)

VARIABLES	(1) Risk	(2) Uncertainty	(3) Weak Modals
FamilyGUO	–0.002	0.001	–0.000
	(–0.72)	(0.40)	(–0.23)
InstInv	0.004	0.002	0.002
	(1.50)	(0.79)	(1.37)
Accruals	–0.000	–0.003	–0.001
	(–0.03)	(–0.26)	(–0.17)
Size	–0.002	–0.002*	–0.001
	(–1.36)	(–1.89)	(–1.20)
Leverage	0.007	0.005	0.004
	(1.06)	(0.81)	(0.91)
Age	–0.003***	–0.004***	–0.003***
	(–2.77)	(–3.02)	(–4.06)
MTB	–0.000	–0.000	0.000
	(–0.49)	(–0.38)	(0.32)
Bus_Segments	0.000	–0.001*	–0.000
	(0.26)	(–1.80)	(–1.10)
Geo_Segments	0.001	0.001**	0.001**
	(0.98)	(2.21)	(2.31)
ROA	–0.001	0.002	0.002
	(–0.08)	(0.19)	(0.34)
EarnVol	0.004***	0.004***	0.002**
	(3.01)	(3.12)	(2.17)
M&A	0.006	0.008	0.002
	(1.11)	(1.40)	(0.64)
Industry FE	YES	YES	YES
Country FE	YES	YES	YES
Clusters	622	622	622
Observations	5,520	5,520	5,520
Adj. R^2	6.7%	5.7%	4.9%

Notes: Columns show the results from an OLS regression where the dependent variable in Column (1) is the number of risk-related words scaled by the total number of words in the document; in Column (2) is the number of uncertainty-related words scaled by the total number of words in the document; in Column (3) is the number of weak modal words scaled by the total number of words in the document. All variables are defined in Appendix 2. All models include industry and country fixed effects. Errors are clustered by firm. Standard errors are shown in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.

Table 9. Family firms and disclosure tone in earnings announcements during the pandemic

VARIABLES	(1) **Risk**	(2) **Uncertainty**	(3) **Weak Modals**
FamilyGUO	–0.003	–0.004*	–0.002**
	(–1.32)	(–1.85)	(–2.03)
InstInv	0.002	0.004*	0.001
	(1.04)	(1.79)	(0.67)
Accruals	–0.009	–0.014	–0.008
	(–0.61)	(–0.91)	(–1.13)
Size	0.000	0.000	0.000
	(0.20)	(0.19)	(0.17)
Leverage	–0.006	–0.008	–0.006*
	(–1.09)	(–1.26)	(–1.96)
Age	0.001	0.000	0.001
	(0.86)	(0.09)	(1.11)
MTB	0.003	0.003	0.001
	(1.59)	(1.34)	(1.02)
Bus_Segments	–0.000	–0.001	–0.000
	(–0.91)	(–1.12)	(–0.65)
Geo_Segments	–0.001*	–0.001	–0.000*
	(–1.76)	(–1.04)	(–1.83)
ROA	0.002	0.003	0.004
	(0.16)	(0.28)	(0.78)
EarnVol	0.002*	0.002*	0.001
	(1.65)	(1.86)	(1.25)
M&A	0.001	0.000	0.001
	(0.22)	(0.06)	(0.28)
Stringency	0.001	0.000	0.002
	(0.33)	(0.11)	(1.31)
Industry FE	YES	YES	YES
Country FE	YES	YES	YES
Clusters	1,156	1,156	1,156
Observations	1,435	1,435	1,435
Adj. R^2	4.7%	4.4%	3.0%

Notes: Columns show the results from an OLS regression where the dependent variable in Column (1) is the number of risk-related words scaled by the total number of words in the earning announcement; in Column (2) is the number of uncertainty-related words scaled by the total number of words in the earning announcement; in Column (3) is the number of weak modal words scaled by the total number of words in the earning announcement. All variables are defined in Appendix 2. All models include industry and country fixed effects. Errors are clustered by firm. Standard errors are shown in brackets. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels respectively.