

Are Family SMEs More Resilient to Economic Policy Uncertainty? Empirical Evidence from Europe

Abstract

This research examines the nexus between economic policy uncertainty (EPU) and financial distress likelihood (FDL) in a panel of 145,611 European Small and Medium-sized Enterprises (SMEs) over a ten-year period (2012–2021). The study uncovers a positive relationship between EPU and financial distress probability, indicating that heightened EPU correlates with an increased likelihood of financial distress for SMEs. Moreover, the research explores the moderating impact of family ownership, revealing that family-owned SMEs demonstrate resilience by mitigating the adverse effects of EPU on financial stability. Surprisingly, family SMEs performing above aspirations amplified the positive impact of EPU on FDL, indicating that family firms performing below aspirations are better equipped for rising EPU, resulting in lower FDL. This study provides new insights into the challenges faced by SMEs during economic uncertainty, emphasizing the protective role of family ownership. The findings carry implications for policymakers, urging customized strategies to support SMEs during uncertain economic times, particularly acknowledging the resilience of family-owned organizations.

Keywords: small- and medium-sized enterprises, economic policy uncertainty, financial distress likelihood, family firms, performance relative to aspirations

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1. Introduction

The economic landscape of Europe is heavily populated by small- and medium-sized enterprises (SMEs), which comprise up to 99% of businesses and serve as the backbone of regional economies¹. Despite their pivotal role, SMEs are particularly vulnerable to external shocks, economic downturns, and policy uncertainties (Miklian & Hoelscher, 2022). This vulnerability prompts an exploration into the relationship between economic policy uncertainty (EPU) and financial distress likelihood (FDL) among European SMEs, a research endeavor that has not been comprehensively addressed in the existing literature. Economic policy uncertainty, as conceptualized by Baker et al. (2016), represents risks arising from unforeseen adjustments in regulatory, fiscal, and monetary policies at the macroeconomic level. This uncertainty significantly influences business activities, investment decisions (Gulen & Ion, 2016), and overall economic performance. To position our study within the existing literature, we delve into the theoretical foundations supporting the relationship between economic policy uncertainty and SMEs stability.

While many studies primarily focus on the U.S. market and large, public companies (e.g., Jory et al., 2020; Li & Qiu, 2021), our research endeavors to extend the analyses to the European market, with a specific emphasis on SMEs. Existing research has extensively explored the impact of EPU on various facets of the economy, including corporate investment decisions (Julio & Yook, 2012), financing (D'Mello & Toscano, 2020), and employment (Caggiano et al., 2020); but a critical gap persists regarding its implications for the financial stability of SMEs across European countries. The significance of this research lies in its potential to shed light on the distinctive challenges faced by SMEs, which, due to their size and resource constraints, may react differently to economic policy uncertainties compared to larger enterprises. In addition, family-owned firms respond differently to external shocks, crises, or uncertainties. Their strong commitment to managing their wealth, long-term perspective (Gómez-Mejía et al., 2007), and enhanced access to credit (Crespí & Martín-Oliver, 2015) should enable them to outperform non-family firms during periods of uncertainty.

The primary objective of this study is to reveal the dynamics between economic policy uncertainty and the financial distress likelihood of European SMEs. By utilizing a comprehensive dataset spanning from 2012 to 2021, encompassing SMEs across 24 European countries, the study seeks to provide insights into how economic policy uncertainty influences the financial health of SMEs over time. To our knowledge, this is the first study that links economic policy uncertainty with SMEs likelihood of financial distress across the European countries. Furthermore, the study aims to shed light on the moderating role of family ownership in mitigating the adverse effects of economic policy uncertainty on SMEs. Family ownership, a common characteristic in SMEs, is explored as a protective mechanism that may enhance resilience during uncertain economic periods. In addition, we explore the effect of family performance relative to aspirations and its moderating role on the relationship between EPU and FDL.

To guide our empirical analysis, we establish a research framework comprising three hypotheses. Our first hypothesis (H1) anticipates a positive relationship between economic policy uncertainty and the likelihood of financial distress among European SMEs. Building on the real options

¹ https://single-market-economy.ec.europa.eu/smes/sme-definition_en

theory and empirical evidence from various studies, we argue that heightened EPU may lead SMEs to adopt risk-averse strategies, including reduced investments potentially resulting in financial distress. Our second hypothesis (H2) introduces the moderating role of family ownership. Drawing on agency theory, we posit that family firms, due to their inherent control potential and strong connections, may exhibit greater resilience against the impact of economic policy uncertainty. This hypothesis aligns with studies by Amore & Minichilli (2018), and Jarchow et al. (2023), and others, suggesting that family ownership mitigates agency problems and contributes to better overall firm performance. Finally, the third hypothesis (H3) proposes that the moderating effect of family firms on the EPU-FDL relationship will be further influenced by performance above aspirations. Based on resource availability, family firms with greater access to resources will be better equipped to navigate economic downturns.

Building upon the theoretical framework and hypotheses, our empirical analysis shows compelling insights into the relationship between economic policy uncertainty and the likelihood of financial distress among European SMEs. Our study demonstrates a statistically significant positive association between EPU and financial distress likelihood, providing empirical support for H1. Moreover, our analysis of the moderating influence of family ownership provides support for H2, revealing that SMEs characterized by family ownership structures demonstrate a mitigated susceptibility to the negative effects of economic policy uncertainty. This empirical evidence not only aligns with existing literature on large corporations but also adds a novel dimension by extending these insights to the SME landscape. Interestingly, our findings do not support H3. However, the results are significant in the opposite direction of our hypothesis, suggesting that family SMEs performing below aspirations are better equipped to navigate economic policy uncertainty than family SMEs performing above aspirations. By merging our findings with the broader literature, we contribute to a more holistic understanding of how economic policy uncertainty shapes the financial outcomes of SMEs and family firms, offering detailed perspectives that can inform policymakers, practitioners, and scholars alike.

This article is organized as follows. Section 2 provides a comprehensive review of the literature on economic policy uncertainty, SMEs' financial distress likelihood, and the moderating role of family ownership. It also formulates our hypotheses based on theoretical foundations and prior empirical evidence. In section 3, we describe our data sources, sample selection criteria, and the econometric methodology employed in our analysis. Section 4 presents the main results from our empirical analysis and section 5 reports the robustness checks analyses. Finally, section 6 discusses and concludes the paper by summarizing key insights, highlighting contributions, and suggesting avenues for future research.

2. Literature review and hypotheses development

2.1. The effects of economic policy uncertainty

Economic policy uncertainty (EPU) represents risks that arise from unexpected adjustments in regulatory, fiscal, and monetary policies at the macroeconomic level (Baker et al., 2016). EPU significantly impacts the economy and business activities at the micro- and macro-levels. A higher level of EPU is often associated with major political, economic, or financial events, which can impact investment decisions, stock market volatility, employment, and overall economic performance. Numerous studies have explored the significant impact of economic policy uncertainty, financial crises, and economic shocks. These include analyses of corporate

investment decisions (Bernanke, 1983; Chen et al., 2019; Gulen & Ion, 2016; Julio & Yook, 2012), employment (Bloom, 2009; Caggiano et al., 2020), financing and trade credit (D'Mello & Toscano, 2020; Drobetz et al., 2018; Duong et al., 2020; Jory et al., 2020; Liu & Wang, 2022; H. V. Phan et al., 2019), innovation (Bhattacharya et al., 2017; He et al., 2022; Xu, 2020), financial stability (Alam et al., 2023; Ali et al., 2023; D. H. B. Phan et al., 2021), and stock volatility (Pástor & Veronesi, 2013).

Drawing upon concepts from real options theory, notable studies by Bernanke (1983), Julio & Yook (2012), and McDonald & Siegel (1986), among others, explain the effects of economic policy uncertainty. Theoretical analyses underscore that a high EPU level acts as an impediment to corporate investment by elevating costs associated with policy-related investments. Consequently, firms engaging in irreversible investment projects exhibit decreased incentives to proceed with such investments. As a result, given the unfavorable outlook for investments, businesses opt to postpone their investment and hiring decisions, adopting a "wait and see" approach (Bloom et al., 2007). This strategy serves to mitigate risks and circumvent the elevated costs associated with heightened economic policy uncertainty and information asymmetry (Liu & Wang, 2022). Other studies confirm the negative influence of EPU on the decision-making and actions related to corporate investments (Baker et al., 2016; Gulen & Ion, 2016). Moreover, Nguyen et al. (2018) demonstrate that firms tend to invest more in foreign countries exhibiting lower levels of EPU compared to their home countries. Nagar et al. (2019) report a significant positive relationship between EPU and information asymmetry, which subsequently impacts the investment decisions of both firms and individuals.

Furthermore, Li & Qiu (2021) empirically prove the claim that high EPU influences capital structure decisions for U.S. firms. As the EPU raises borrowing costs, companies respond by reducing debt levels to maintain financial stability. In an international study involving 21 countries over the 1989-2012 period, researchers find that EPU raises the cost of capital, resulting in reduced firm investments (Drobetz et al., 2018). In response to heightened economic policy uncertainty, companies tend to reduce their investment levels and increase cash holdings as a protective measure against unpredictable conditions (Demir & Ersan, 2017; H. V. Phan et al., 2019). Additionally, Duong et al. (2020) concur that firms tend to increase their cash holdings during times of high EPU. They argue that this rise is not due to a decrease in investments but is instead a strategic move to counteract the adverse impacts of EPU on capital investment. Finally, it is important to note that most of the literature and studies on EPU primarily focus on large companies and publicly listed firms.

2.2. Economic policy uncertainty and financial distress

This study focuses on the significant influence of economic policy uncertainty on small- and medium-sized enterprises across Europe, specifically the financial stability of SMEs. As per a study by Miklian & Hoelscher (2022), SMEs are especially sensitive to crises and disruptions. These difficulties make it tough for them to secure funding, maintain regular operations, manage their supply chains, and, consequently, have a substantial impact on their overall business performance. Global financial crises and macroeconomic uncertainty have a significant impact on firms' capital structure (Demirgüç-Kunt et al., 2020). This study contends that the effects vary across firms depending on their characteristics. Publicly listed companies, particularly larger ones, experience comparatively milder adverse consequences compared to unlisted firms, which include SMEs. Larger firms find it more feasible to access financial markets, affording them

greater access to information. This advantage helps mitigate the decline in bank loans compared to smaller businesses during a crisis. This decreased accessibility for small businesses consequently increases the probability of financial distress for these companies. The findings by Demirgüç-Kunt et al. (2020) corroborate a decrease in debt maturity among unlisted firms, encompassing both large enterprises and SMEs, following the global financial crisis. However, among listed firms, there is less evidence of a substantial decline in debt maturity, which can be attributed to their enhanced access to external financing (Kaviani et al., 2020). In line with previous arguments, amid economic instability, such as during the 2008 financial crisis, firms tend to reduce their investments (Zubair et al., 2020), leverage, and debt maturity. Concurrently, expected returns also decrease, leading lenders and financial institutions, including banks, to become more reluctant to extend credit to firms due to the increased risk of default (Ivashina & Scharfstein, 2010). SMEs are especially reliant on external financing, and particularly bank loans, which makes this issue particularly relevant to them (Beck & Demirguc-Kunt, 2006). Consequently, SMEs face increased financial constraints during periods of uncertainty. In a recent article, Cucculelli & Peruzzi (2020) study the postcrisis survival of manufacturing Italian firms and showed that SMEs have a higher probability of defaulting. They also find that poor financial performance and smaller firm size make it difficult for SMEs to adopt default-reducing strategies, leading to the end of business operations. SMEs are vulnerable, particularly during economic turbulence, because they have a limited capacity to downsize and diversify their activities and they face severe financial restrictions.

Financial distress is a crucial metric for firms, enabling them to assess their performance and overall financial health within the market and industry. Several scholars have made significant contributions to literature by developing methods to measure financial distress and failure over the years. Notable contributors include Beaver (1966), Altman (1968), Ohlson (1980), Asquith et al. (1994), and Pindado et al. (2008). SMEs face great uncertainty during economic crisis that may lead to financial distress. Small firms are especially susceptible to external shocks and encounter added challenges related to resource availability and liquidity issues during disasters and crises (Eggers, 2020). Empirical evidence provided by Iqbal et al. (2020) study indicates that EPU has an adverse impact on firm performance, as measured by accounting (e.g., return on assets (ROA), and return on equity (ROE)) and market-based (Tobin's Q) metrics (Ahsan & Qureshi, 2021). Furthermore, Fedorova et al. (2022) assert that the likelihood of firms filing for bankruptcy is significantly influenced by the presence of economic policy uncertainty. This argument is supported by Stolbov & Shchepeleva's (2020) study, which finds that economic policy uncertainty contributes to an increase in firm bankruptcies. Byrne et al. (2016) also confirms that uncertainty has a significant effect on firm survival using a panel of UK firms. For small businesses, making prudent financial decisions is crucial to ensure their survival (Tekin, 2021). Filipe et al. (2016) find that SMEs demonstrate greater susceptibility, as supported by analyses of systematic distress factors, as opposed to larger firms. The literature review suggests that EPU negatively impacts corporate investments and financial performance by exacerbating information asymmetry, increasing corporate risk, and elevating capital costs. This, in turn, creates financial challenges for firms and, more critically, for SMEs, potentially leading to financial distress. Based on these observations, we propose the following hypothesis:

H1. Economic policy uncertainty increases the likelihood of financial distress among SMEs across European countries.

2.3. The moderating role of family ownership

Family firms are widespread in the global business landscape, holding significant shares in companies across economies and markets all over the world, as evidenced by studies such as those by Faccio et al. (2002), La Porta et al. (1999), and Morck et al. (2005). Drawing on agency theory, socioemotional wealth approach, and existing literature, family firms exhibit distinct behaviors in terms of investment (Amore & Minichilli, 2018; Bianco et al., 2013; Chrisman & Patel, 2012), financing (Boubakri et al., 2010), innovation (Kotlar et al., 2013; Muñoz-Bullón et al., 2020), risk preferences (Gómez-Mejía et al., 2007; Kotlar et al., 2013), and dealing with stakeholders such as creditors/lenders (Crespí & Martín-Oliver, 2015; Hillier et al., 2018). In this study, we are interested in analyzing whether family ownership attenuates the expected positive impact of economic policy uncertainty on the likelihood of financial distress for small- and medium-sized enterprises.

The literature investigating family ownership is diverse, with a significant distinction between SMEs and large listed firms. SMEs, characterized by their modest scale in terms of revenue, assets, and workforce, present unique dynamics within the field of family ownership. These enterprises often cope with resource constraints, both financial and managerial, impacting decision-making processes. In SMEs, family owners frequently play a more direct role in decision-making due to their organizational structure (Carney, 2005; De Massis et al., 2015). The access to capital for SMEs relies more on private financing compared to large publicly listed firms, which benefit from public market access (Demirgüç-Kunt et al., 2020; Miklian & Hoelscher, 2022). Family-owned SMEs are often closely held, featuring concentrated ownership structures (González-Cruz & Cruz-Ros, 2016), in contrast to the dispersed ownership of their publicly listed counterparts. Moreover, family-owned SMEs tend to exhibit a stronger inclination towards long-term goals and sustainability, reflecting a focus on legacy and generational continuity (Le Breton-Miller & Miller, 2006; Lumpkin & Brigham, 2011; Pindado & Requejo, 2015). This contrasts with the potentially shorter-term focus of publicly listed companies. Additionally, the regulatory landscape differs, with publicly listed firms facing stricter compliance requirements (Holder-Webb et al., 2008).

Building on the agency theory and the conflict between owners and managers, when it comes to monitoring a company, individuals and families (who have their personal wealth invested in the business) might be more vigilant compared to institutional shareholders. The argument is that, since families directly risk their own wealth without additional layers of oversight, they may be more motivated to actively watch over and control the company (Villalonga & Amit, 2010). This increased involvement is referred to as "control potential" by Demsetz & Lehn (1985). In a study by O'Boyle et al. (2012), the impact of family involvement on the financial performance of firms was explored from an agency theory viewpoint, suggesting that extensive family involvement substantially decreases information asymmetries (De Massis et al., 2015). Past studies support the notion that family-run businesses encounter minimal or no agency problems because of the alignment between ownership and management (Fama & Jensen, 1983; Jensen & Meckling, 1976). Consequently, high family involvement is expected to enhance performance since the owners are inclined to act in the best interest of the family firm, considering themselves, management, and owners as the same entities.

Another aspect of agency theory explores the relationships between majority and minority shareholders. Given that family firms are overseen and owned by majority family shareholders,

this confers the firm with advantages in decision-making power (Anderson & Reeb, 2003), resilience, and adaptability to economic changes (Amore & Minichilli, 2018). Family structures, with majority ownership, effectively manage agency conflicts, optimize resource allocation decisions, and foster a long-term orientation (Le Breton-Miller & Miller, 2006; Lumpkin & Brigham, 2011). Therefore, family firms are better positioned to navigate economic uncertainty compared to firms with dispersed ownership. However, it is essential to acknowledge that this structure is also associated with agency costs borne by minority shareholders, especially if family owners act solely in the family's interest (Purkayastha et al., 2022).

The empirical evidence on a sample of non-financial Italian firms indicates that family firms might be perceived as more creditworthy due to their reduced incentive to default in the future (D'Aurizio et al., 2015). These authors argue that the presence of a family block-holder had a positive effect in mitigating the agency conflict between borrowers and lenders, closely associated with the increased reliance on soft information by Italian banks in lending decisions following the Lehman Brothers failure. In line with this idea, family firms have a distinct advantage in accessing external funding sources and securing credit compared to nonfamily firms, particularly during economic crises. This advantage is attributed to several factors, such as the trustworthiness of family owners, the collateral that family firms can offer, and the enduring long-term relationships that family firms maintain with their lenders (Crespí & Martín-Oliver, 2015). Family firms prioritize increasing the overall company value, fostering a more closely aligned interest with creditors compared to non-family firms exclusively concentrating on shareholder value (Hillier et al., 2018).

Recently, another body of literature has been exploring the influence of family firms through the lens of the socioemotional wealth (SEW) theory (e.g., Berrone et al., 2012; Gómez-Mejía et al., 2007; Gomez-Mejia et al., 2011). SEW includes nonfinancial and non-economic aspects such as reputation, family legacy, control, values, culture, and long-term relationships, which are highly valued by family firms. Therefore, family owners prioritize the survival of their business over maximizing profit because they are concerned about preserving their family's wealth and heritage (González et al., 2012; Thomsen & Pedersen, 2000). Family firms are more likely to pursue acquisitions that enhance generational legacy, even if these acquisitions do not maximize financial wealth. This is because family firms are willing to sacrifice some financial wealth in order to preserve family values and culture (Gomez-Mejia et al., 2015). While this may appear detrimental to the family firm's financial well-being, the motivation derived from SEW prompts them to make decisions that contribute to the long-term benefit of the firm. Consequently, creditors must navigate a delicate balance between enforcing strictness and exercising leniency when negotiating loan agreements with family firms. Excessive strictness has the potential to create challenges for the family business, whereas adopting a more understanding approach may not incur significant costs for creditors, given the enduring connections typically associated with family businesses (Hillier et al., 2018). The findings suggest that family firms' less strict debt contracts reflect a higher level of trust and cooperation between family firms and creditors.

The academic literature offers mixed findings of family firms influence (Chrisman et al., 2005; Gedajlovic et al., 2012), with certain studies highlighting the positive impact of family influence on firm performance (Chu, 2009; Lohwasser et al., 2022; Maury, 2006), while others reveal insignificant or ambiguous effect of family involvement on performance (O'Boyle et al., 2012). Swanpitak et al. (2020) report contrasting findings, providing evidence that family firms

outperform non-family firms in times of political uncertainty. The lack of conclusive results can be attributed to the diverse aims of the studies, each emphasizing different facets and contexts of family firms (Pindado & Requejo, 2015).

Analyzing distinct advantages of family businesses, an Italian study by Amore & Minichilli (2018) indicates that, during politically uncertain periods, family firms are inclined to invest more compared to their counterparts. This is because family control acts as a stabilizing factor or “investment resilience”, counteracting the reduction in investment caused by elevated local policy uncertainty. Also, family firms with long-term orientations and sustainable capability are more likely to survive and adapt to changing conditions in the long term (Le Breton-Miller & Miller, 2006). Despite their risk aversion, private family firms achieve similar performance levels to non-family firms over the long term, are more resilient in the face of economic downturns, and exhibit greater longevity compared to their counterparts (Carney et al., 2015). Additional empirical evidence confirms that family firms outperform non-family firms during periods of crisis and uncertainty, demonstrating a “crisis resilience” that contributes to greater financial performance (Jarchow et al., 2023). Based on the preceding theory, discussion, and findings, we formulate our second hypothesis as follows:

***H2.** Family ownership mitigates the positive impact of economic policy uncertainty on financial distress likelihood across European SMEs.*

2.4. Influence of performance above aspirations

Family firms/SMEs performing above aspirations often have accumulated slack resources, which are excess resources that can be utilized in times of need. These resources can take various forms, such as financial reserves, surplus inventory, or untapped credit lines. Such resources provide a critical buffer during periods of economic volatility caused by economic policy uncertainty (EPU), allowing the firm to maintain operations and cover unexpected expenses without resorting to drastic measures like layoffs or asset sales (Sirmon & Hitt, 2003).

High-performing family firms typically have healthier balance sheets with stronger liquidity positions and lower debt levels. This financial resilience makes them less susceptible to short-term liquidity crises induced by sudden changes in economic policy. For instance, they can absorb shocks from increased interest rates or reduced consumer spending without immediately facing financial distress. Furthermore, having surplus resources allows these firms to invest in strategic initiatives that can mitigate the impact of EPU, such as diversifying their product lines, entering new markets, or investing in technology to improve efficiency. Such strategic flexibility is less feasible for firms with limited resources.

Conversely, family firms/SMEs performing below aspirations often struggle with resource constraints. Their financial reserves may be depleted, and they may have already utilized their available credit lines, leaving them with little to no buffer to withstand additional shocks from EPU. The lack of slack resources makes them more vulnerable to economic policy changes, as they have fewer options to manage unexpected financial pressures. These firms are likely to have weaker financial positions, characterized by higher leverage and lower liquidity. Consequently, they are more exposed to financial distress when facing economic uncertainty because they lack the necessary reserves to cover short-term obligations and may find it difficult to secure additional financing under unfavorable economic conditions.

Resource-constrained firms often have limited flexibility to adapt their strategies in response to EPU. They may be forced to cut essential costs, reduce investments, or delay important projects, further exacerbating their financial distress. Their inability to invest in diversification or efficiency improvements makes them more susceptible to the adverse effects of economic policy changes.

In conclusion, family SMEs performing above aspirations can leverage their superior resource availability to mitigate the effects of EPU on financial distress likelihood through accumulated slack resources, financial resilience, and strategic flexibility. In contrast, those performing below aspirations, constrained by limited resources, increased financial vulnerability, and operational rigidity, are less equipped to handle the negative impacts of EPU, making them more prone to financial distress. Thus, we posit the following hypothesis:

H2. The moderating effect of family firms on the EPU-FDL relationship will be further influenced by performance above aspirations, thereby mitigating the impact of EPU on FDL.

Summary of the hypotheses is presented in Figure 1 graphically.

[Figure 1 about here]

3. Data and methods

3.1. Data and sample

Our sample is constructed using Orbis Europe, a database developed by Bureau van Dijk, which provides detailed information on standardized financial data for European firms, including their corporate ownership structure. Applying several filters to arrive at our final sample, we first adhered to the EU's definition of small- and medium-sized enterprises (SMEs)². This involved restricting our sample to an employee count ranging from fewer than 250 to a minimum of 10. Consistent with the SME definition, we also considered financial metrics, incorporating firms with total assets between 2 million and 43 million Euros, or operating revenue within the interval of 2 million to 50 million Euros.

Secondly, we excluded all SMEs from the utility, financial, and governmental sectors (SIC codes 400-499, 600-699, and 910-999, respectively) due to the incomparability of their returns with those of other industries. We also removed all listed companies based on their status. Furthermore, based on the standard legal form of companies, we retained private limited companies and public limited companies only. We deleted observations with outliers in any of the firm-level variables to mitigate concern over extreme values (winsorized at 1% and 99% percentiles).

SMEs were selected for each country, provided they had data available for at least five consecutive years, aiming to conduct a more robust analysis. One year of data was omitted when compiling some of the flow variables, such as the sales growth variable. Based on these criteria, we have an unbalanced panel of 145,661 European SMEs (covering 24 countries) during 2012–2021, resulting in 1,089,054 firm-year observations. These filters ensure the inclusion of companies aligning with the SME classification, thereby facilitating a focused and relevant

² More details on: https://single-market-economy.ec.europa.eu/smes_en

analysis. The original dataset included data for the EU27 countries and the United Kingdom. However, during the data filtering process, four countries were excluded from the final sample.

3.2. Key variables

3.2.1. Financial distress likelihood (dependent variable)

The primary focus of our study is on assessing the likelihood of financial distress, the dependent variable. Our aim is to explore the behavior of financially distressed SMEs in the context of high economic policy uncertainty in Europe. While there is no universally agreed-upon definition of financial distress, we employ Altman (2013), and Altman et al.'s (2017) method, which is a modified version of the approach introduced in Altman (1968) and Altman et al. (1977). The modified approach involves a complete re-estimation of the Z-Score model, originally designed for publicly traded entities. The revised model, adapted for private firms and SMEs (Altman & Sabato, 2007), is more applicable in our context. A recent study, utilizing this approach, predicts firm failure and financial distress across 13 European countries using a large sample of SMEs (McGuinness et al., 2018).

The data used for measuring financial distress likelihood has been sourced from Bureau van Dijk's Orbis Europe database. We classify an SME as financially distressed if its Z-Score is below 1.23. A higher Z-Score is associated with lower financial distress likelihood. Therefore, an indicator value of one (Z-Score below 1.23) implies a higher likelihood of financial distress. The dependent variable is represented by a binary variable, taking the value of one in the case of financial distress, and zero otherwise. The Altman Z-Score for private firms is computed using the following formula:

$$Z' = 0.717(X_1) + 0.847(X_2) + 3.107(X_3) + 0.420(X_4) + 0.998(X_5)$$

Where, X_1 = working capital/total assets; X_2 = retained earnings/total assets; X_3 = earnings before interest and taxes/total assets; X_4 = book value of equity (net worth)/book value of total liabilities; X_5 = sales/total assets; and Z' = overall index. Table 1 categorizes the sample by country, firm count, financial distress likelihood, and family ownership status. The total number of financially distressed observations in our sample is 115,454, comprising approximately 11% of the total sample. Greece and Italy have the highest percentage of distressed SMEs at 22% and 16%, respectively. Sweden and Luxembourg have the lowest percentage at 3%.

[Table 1 about here]

3.2.2. Economic policy uncertainty (independent variable)

In accordance with many recent studies on economic policy uncertainty, EPU stands as the focal independent variable in our study, investigating its influence on the likelihood of financial distress among European SMEs. For our EPU measurement, we rely on the EPU index developed by Baker et al. (2016). Widely accepted in the literature, this index offers a comprehensive assessment of policy-related uncertainty, encompassing dimensions such as tax policy, foreign affairs, and regulations. EPU is a quantifiable measure of the degree of uncertainty surrounding economic policies within a given context or region. It is developed by and assessed through indices that track the frequency of newspaper coverage of economic policy-related events and developments. As discussed by Nguyen et al. (2018), the approach of

media and newspaper can measure uncertainty of markets, economy, political situation through the repetitive use of certain words. Baker et al. (2016) propose that conducting searches on newspaper texts can provide valuable proxies for assessing economic and policy conditions at both the micro- and macro-levels. For instance, they conduct searches for a combination of particular terms in the articles, including “uncertain” or “uncertainty,” “economic” or “economy,” and a policy-related term such as “regulation” or “legislation”. The resulting count of articles is then divided by the total number of articles in the corresponding month and newspaper, ultimately yielding a continuous monthly variable index³.

The data⁴ is accessible online and is presented on a monthly basis, and the index covers twenty-two countries worldwide. Nine countries in our sample (Germany, Spain (Ghirelli et al., 2019), France, United Kingdom, Greece (Hardouvelis et al., 2018), Ireland (Zalla, 2016), Italy, Netherlands (Kroese et al., 2015), and Sweden (Armeliu et al., 2017)) have their dedicated country EPU index. For other European countries without a unique index, we utilized the European EPU index, calculated as an average across all 10 leading European newspapers.

For our empirical analysis, we employ the natural logarithm of the annual average EPU index (e.g., Guedhami et al., 2021; Li & Qiu, 2021) to improve interpretability. This choice aligns with the availability of other variables yearly, facilitating more meaningful comparisons. The index ranges from 4.149 to 6.297 in the sample. Our analysis explores the dynamic relationship between yearly variations in economic policy uncertainty and the financial distress likelihood of European SMEs. Beyond a mere assessment of the overall level of uncertainty, our study provides insights into the sustained impact of policy-related uncertainty on the financial health of SMEs over time. A higher economic policy uncertainty index can lead to economic instability, increasing the likelihood of financial distress. Figure 2 depicts the monthly European EPU index for the period 2010 to 2022, covering our sample period from 2012 to 2021. The graph illustrates notable spikes coinciding with events such as the Brexit referendum in 2016, the Covid-19 pandemic in 2020, and the war between Russia and Ukraine in 2022. The trend of the European EPU index is increasing over time.

[Figure 2 about here]

3.2.3. Family ownership (moderating variable)

We incorporate family ownership as a factor shaping the impact of EPU on the likelihood of financial distress in European SMEs. We set a control threshold of 50% to classify firms into family and non-family, following the methodology of Crespí & Martín-Oliver (2015) and Steijvers & Voordeckers (2009). This criterion ensures that the family owns the firm. This involves a binary variable taking the value of one if an individual or family controls at least 50% of voting rights, and zero otherwise.

Data for this analysis is sourced from Bureau van Dijk’s Orbis Europe database, well-known for its Global Ultimate Owner (GUO) variables such as name and type. The GUO variables identify the owner, be it an individual, family, government, or other entities. This approach ensures an

³ More details from Baker et al. (2016).

⁴ More details on: policyuncertainty.com

accurate determination of factual voting power within a firm, specifically when it exceeds a 50% threshold.

In our sample, family firms controlling more than 50% represent 48% of the SMEs, as indicated in Table 1, enabling us to examine their impact on shaping the relationship between EPU and financial distress likelihood. Romania, Bulgaria, and Greece, have the highest family ownership percentages at 75%, 69%, and 67%, respectively. Family ownership often implies a long-term commitment and a more conservative approach, which should reduce the likelihood of financial distress.

3.2.4. Performance relative to historical aspirations (moderating variable)

We introduce an additional proxy variable to test our third hypothesis, ROA change, to capture the moderating effect of a family-owned firm's performance relative to its aspiration level on the relationship between economic policy uncertainty and financial distress likelihood. ROA change is a continuous variable calculated as the difference between a firm's current performance (EBITDA/total assets in year t) and its performance in the previous year (year $t-1$). This approach aligns with the broader literature on aspiration performance, with Doucet et al. (2023) providing a particularly relevant application in the context of family-owned firms. Similar definitions with minimal variation are also used by Ma et al. (2023) and Ref & Shapira (2017), often measured through binary variables to capture performance above or below historical and/or social aspirations. A positive ROA change indicates performance exceeding aspirations, while a negative value suggests performance falling short. We posit that family-owned SMEs exceeding aspirations will demonstrate greater resilience to the negative effects of economic policy uncertainty on financial distress likelihood. This resilience likely arises from superior resource availability, which acts as a buffer during periods of economic volatility.

3.3. Country and firm control variables

Our selection of firm and country control variables is the standard set of variables used in prior literature. Firm-level control variables are defined as follows: earnings before, interests, taxes, depreciation, and amortization (EBITDA), divided by the book value of total assets (Profitability); total debt divided by the book value of total assets (Leverage); property, plant, and equipment divided by the book value of total assets (Tangibility); logarithm of net sales or revenues divided by last net sales or revenues from previous fiscal year (Sales growth); logarithm of the book value of total assets (Firm size); logarithm of the difference between the current calendar year and the year of incorporation (Firm age). Country control variables serve to manage for macroeconomic conditions and are described as follows: the annual change in consumer prices (Inflation); logarithm of real gross domestic product (GDP) per capita (GDP per capita); and the change in local currency relative to U.S. dollars divided by last year exchange rate (Change in exchange rate).

The expected impact of the control variables on financial distress likelihood is as follows. Profitability is expected to exert a negative influence as higher profitability signals improved financial health, thereby diminishing the likelihood of financial distress. Conversely, leverage is anticipated to have a positive impact due to its association with heightened financial risk, elevating the probability of financial distress. Tangibility is expected to have a positive impact on financial distress likelihood, as a higher proportion of tangible assets may result in increased

financial obligations and maintenance costs, potentially elevating the risk of financial distress. Sales growth is expected to have a negative effect, reflecting business expansion and financial health, thus lowering the likelihood of financial distress. Firm size is expected to negatively impact financial distress likelihood, as larger firms may indicate greater operational capacity and scale, reducing the probability of financial distress. Older firms (Firm age) are expected to experience lower instability due to their longer track record, implying a lower likelihood of financial distress. Inflation is expected to positively impact the likelihood of financial distress due to its potential to increase costs for businesses and consumers, reduce purchasing power, and create economic uncertainty. GDP per capita is expected to negatively affect financial distress likelihood, as they reflect economic strength and expansion, respectively, reducing the probability of financial distress. The expected impact of the change in the exchange rate varies based on whether a strengthening or weakening of the local currency relative to USD is favorable or unfavorable for the firm, influencing competitiveness and financial conditions. Table 2 provides summary statistics for firm-level and country-level variables. Notably, the average SME firm in the sample shows a mean of 10.7% in profitability, tangibility of 3.01%, leverage of 59.4%, and sales growth of 7.4%.

3.4. Descriptive statistics

Table 2 presents the means, standard deviations, and main percentiles of all variables considered in the main regression analyses. The pair-wise correlation matrix of the variables used in the analyses is provided in Table 3. Furthermore, Table 4 shows the distribution of the sample across sectors and over time. The manufacturing industry prevails with 36%, followed by the wholesale trade, representing 23% of the total sample. Appendix 1 provides the definition, source, and frequency of the variables.

[Table 2 about here]

[Table 3 about here]

[Table 4 about here]

3.5. Econometric specification

Given the structure of our dataset and the distinctive attributes of our variables, selecting an appropriate econometric specification is critical to ensure the robustness and accuracy of our analyses. In this regard, we opt for a logit regression model to examine the hypotheses outlined in our research framework. The rationale for employing a logit regression model lies in its suitability for analyzing binary dependent variables within a cross-sectional dataset. This modeling approach is particularly relevant for our study, where the dependent variable, the likelihood of financial distress, is dichotomous, taking the value of 1 if the firm is distressed and 0 otherwise. While logit regression is typically applied to cross-sectional data, it still enables us to incorporate relevant independent variables to assess their impact on the likelihood of financial distress. Specifically, our model includes three key independent variables: Economic Policy Uncertainty (EPU), represented as a continuous variable; a binary indicator denoting family ownership status; and ROA change, a continuous variable capturing changes in Return on Assets over time. This methodological approach aligns with established practices in logistic regression analysis and ensures a comprehensive examination of the determinants of financial distress

within the context of varying firm ownership structures and economic conditions. However, considering the possibility of unobserved heterogeneity across firms, a random effects model is selected. The random effects model allows us to account for firm-specific characteristics that may not be captured by our independent variables, thus providing a more accurate and robust estimation. This is particularly important in our dataset, where unobserved factors may influence the likelihood of financial distress across different firms. Therefore, our preferred estimation method is a logistic regression model with random effects. To test the first hypothesis, we employ the model specified as follows:

$$P(FDL)_{i,t} = \beta_0 + \beta_1 * \ln(EPU\ Index)_{i,t} + \beta_2 X_{2i,t} + \beta_3 X_{3i,t} + \dots + \varepsilon_{it} + Year\ effects + Industry\ effects + Country\ effects \quad (1)$$

Where Financial Distress Likelihood presented in Equation (1) is the dependent variable, coded as 1 or 0 (refer to Section 3.2.1 for details). β_0 is the constant term. β_i are the coefficients associated with the respective independent variables (X_2 , X_3 , etc.). $\ln(EPU\ Index)$ is the natural logarithm of the EPU index (refer to Section 3.2.2 for details). X_2 , X_3 , etc. represent the control variables outlined in Section 3.3. ε_{it} is the error term, capturing unobserved factors influencing the likelihood of financial distress for a specific firm (i) at a specific point in time (t). The subscripting (i , t) reflects the panel structure of our data with repeated observations on the same firm across different years. We will report both the estimated coefficients (β) and the corresponding odds ratios (ORs) for each independent variable. The coefficients represent the change in the log-odds of financial distress likelihood for a one-unit increase in the independent variable. The odds ratios, calculated by exponentiating the coefficients, provide a more intuitive interpretation of the effect size, indicating how much the odds of financial distress likelihood change for a one-unit increase in the independent variable (holding all other variables constant).

The second hypothesis explores the potential moderating effect of family ownership on the relationship between EPU and financial distress. We hypothesize that family ownership (as defined in Section 3.2.3) might mitigate the negative impact of EPU on a firm's financial health. To test this hypothesis, we extend the initial logistic regression model by introducing an interaction term between the $\ln(EPU\ Index)$ and a family ownership dummy variable. This term captures the joint effect of these two variables on the likelihood of financial distress. The model for testing the second hypothesis is presented in Equation (2):

$$P(FDL)_{i,t} = \beta_0 + \beta_1 * \ln(EPU\ Index)_{i,t} + \beta_2 * Family\ Ownership_{i,t} + \beta_3 * \ln(EPU\ Index)_{i,t} * Family\ Ownership_{i,t} + \beta_4 X_{4i,t} + \beta_5 X_{5i,t} + \dots + \varepsilon_{it} + Year\ effects + Industry\ effects + Country\ effects \quad (2)$$

Here, the coefficient β_3 of the interaction term ($\ln(EPU\ Index)_{i,t} * Family\ Ownership_{i,t}$) represents the change in the log-odds of financial distress due to a one-unit increase in the $\ln(EPU\ Index)$ for firms with family ownership (compared to firms without family ownership). We will interpret this coefficient along with the corresponding odds ratio to understand the moderating effect of family ownership.

Building on the prior analyses, we explore a three-way interaction effect to examine whether the moderating effect of family ownership on the relationship between EPU and financial distress (as hypothesized in H2) is further influenced by a firm's performance relative to aspirations. Family-owned firms exceeding aspirations (positive ROA change) are hypothesized to have greater

financial resources compared to those falling short. To test this three-way interaction effect, we can extend the logistic regression model from Equation (2) by introducing an additional interaction term between the interaction term $\ln(\text{EPU Index})_{i,t} * \text{Family Ownership}_{i,t}$ and a new variable capturing performance relative to aspirations ($\text{ROA change}_{i,t}$). This new term would capture the joint effect of family ownership, EPU, and performance relative to aspirations (as defined in Section 3.2.4) on the likelihood of financial distress. The full model for testing the three-way interaction is presented in Equation (3):

$$P(\text{FDL})_{i,t} = \beta_0 + \beta_1 * \ln(\text{EPU Index})_{i,t} + \beta_2 * \text{Family Ownership}_{i,t} + \beta_3 * \ln(\text{EPU Index})_{i,t} * \text{Family Ownership}_{i,t} + \beta_4 * \text{ROA change}_{i,t} + \beta_5 * \ln(\text{EPU Index})_{i,t} * \text{ROA change}_{i,t} + \beta_6 * \text{Family Ownership}_{i,t} * \text{ROA change}_{i,t} + \beta_7 * \ln(\text{EPU Index})_{i,t} * \text{Family Ownership}_{i,t} * \text{ROA change}_{i,t} + \beta_8 * X_{8i,t} + \beta_9 * X_{9i,t} + \dots + \varepsilon_{i,t} + \text{Year effects} + \text{Industry effects} + \text{Country effects} \quad (3)$$

This coefficient β_7 captures the three-way interaction effect introduced by the third hypothesis. It represents how performance relative to aspirations ($\text{ROA change}_{i,t}$) influences the moderating effect of family ownership on the EPU-FDL relationship. A negative coefficient β_7 suggests that for family-owned firms with ROA growth, the moderating effect of family ownership on the EPU-FDL relationship strengthens. This would indicate that the mitigating effect of family ownership becomes more pronounced when performance is strong.

It is important to note that in all three models, we included year, industry, and country fixed effects to account for unobserved time-invariant factors at the year, industry, and country levels that might influence the likelihood of financial distress. This allows us to isolate the effects of the independent variables on the dependent variable while controlling for these group-specific effects.

4. Results

4.1. Main regression analyses

To test our three main hypotheses, we examine the effect of economic policy uncertainty on the likelihood of financial distress in European SMEs, the moderating role of family ownership, and the triple interaction of ROA change with family ownership and EPU on FDL. In Table 5, we report the estimated coefficients (columns 1a, 2a, and 3a) and the odds ratios (columns 1b, 2b, and 3b) for each empirical model. Odds ratios (ORs) range from zero to infinity. An OR less than 1 indicates a negative association with financial distress, meaning the variable makes it less likely. Conversely, an OR greater than 1 suggests a positive association, meaning the variable increases the likelihood of financial distress. The findings from the logistic regressions show that EPU positively impacts financial distress likelihood, thereby confirming Hypothesis 1. The estimated coefficient for the natural logarithm of EPU is positive and significant (0.077, column 1a), and the odds ratio is greater than 1 (1.08, column 1b). This indicates that a one-unit increase in $\ln(\text{EPU})$ is associated with a slight but statistically significant increase in the odds of financial distress. Similarly, the results from the logistic estimation (columns 2a and 2b) confirm Hypothesis 2. The coefficient for the interaction term between $\ln(\text{EPU})$ and family-owned SMEs is significantly negative (-0.388, column 2a), and the odds ratio is below 1 (0.679, column 2b). This indicates that family ownership mitigates the impact of EPU on FDL. In simpler terms, for a one-unit increase in EPU, the increase in the odds of financial distress is less pronounced for family-owned SMEs compared to the average effect across all firms. Surprisingly, the results for

Hypothesis 3 are significant but contrary to our expectations. The estimated coefficient for the three-way interaction between $\ln(\text{EPU})$, family ownership, and ROA change is positive (1.069, column 3a), and the odds ratio is above 1 (2.912, column 3b). The result does not support Hypothesis 3. This suggests that, contrary to our hypothesis, when family-owned SMEs experience positive changes in ROA, it increases the impact of EPU on the likelihood of financial distress. In other words, family firms performing above their aspirations see an amplified effect of economic policy uncertainty on financial distress likelihood, rather than a mitigating effect as initially hypothesized.

Moreover, while most control variables exhibit the expected signs, firm size unexpectedly showed the opposite effect. This means that the larger the total assets of SMEs, the higher the likelihood of financial distress. This counterintuitive result could be due to larger firms having more complex operations, higher fixed costs, and greater debt levels, which can increase their vulnerability to financial distress. Importantly, all control variables show statistical significance in all models, confirming their anticipated impact and relevance.

[Table 5 about here]

5. Robustness Tests

5.1. Alternative definitions of key variables

To address potential measurement error, we employ robustness checks by re-estimating the models with alternative definitions for all independent variables (economic policy uncertainty, family ownership, and ROA change).

5.1.1. Economic policy uncertainty

We utilize the World Uncertainty Index (WUI) as an alternative measure to economic policy uncertainty. The WUI, introduced by Ahir et al. (2022), is computed by counting the frequency of the term "world uncertainty" (or its variants) in Economist Intelligence Unit (EIU) country reports. These counts are normalized by the total number of words and rescaled by multiplying by 1,000, with higher values indicating greater uncertainty and vice versa. The WUI provides monthly data for 71 countries from 2008 onwards and quarterly data for 143 countries from the 1950s onwards, covering our sample period. We primarily use the monthly data and supplement it with quarterly data for countries where monthly data is unavailable. We calculate the annual average from either the monthly or quarterly data. Out of the original 24-country sample, the index includes 22 countries. Table 6 presents our main model regressions using the WUI as an alternative measure, demonstrating that our results remain robust with this approach.

[Table 6 about here]

5.1.2. Family ownership

As outlined in Section 3.2.3, the initial definition of family ownership classifies an SME as a family SME when it is owned by a family with at least a 50% ownership threshold. To enhance the precision of this definition, we have incorporated additional criteria based on the available data. Specifically, we require that the global ultimate owner, who holds this significant ownership stake, also be actively involved in the management of the SME. Our refined definition

thus stipulates that for an SME to be considered a family SME, it must meet two conditions: first, the family must own at least 50% of the company, and second, the family's global ultimate owner must also serve as a manager within the company. This nuanced approach ensures a more comprehensive understanding of family involvement in both ownership and managerial roles. Employing this revised definition, our analysis demonstrates that the regression results for the second and third hypotheses remain robust and significant, as detailed in Table 7. This finding underscores the validity of our results, even when applying a more stringent definition of family ownership and management.

[Table 7 about here]

5.1.3. ROA change

To test our third hypothesis, we measure performance relative to historical aspirations using the change in EBITDA to total assets compared with the previous year. This metric provides a comparison of historical performance. As an alternative measure, we use performance relative to social aspirations. Specifically, sales social change quantifies the difference between a firm's natural logarithm of net sales and the median natural logarithm of net sales within its industry for the same year. This approach offers insight into the firm's relative revenue performance within its industry context, following a similar method as Ma et al. (2023). While using this alternative measure, the results for our third hypothesis remain robust. However, they do not support our hypothesis, as in the main regressions, the significance is in the opposite direction. Table 8 reports these results.

[Table 8 about here]

5.2. Panel Data Regressions

In order to ensure the robustness and reliability of our primary regression findings, we conduct additional analyses using panel data random effects logistic regressions (the “xtlogit” command in Stata). This approach includes clustering by firm ID to account for potential correlations within firms over time, and robust standard errors are reported to enhance the accuracy of our estimations. The results from this supplementary analysis, presented in Table 9, substantiate our initial findings. Importantly, all three hypotheses remain highly significant, aligning consistently with the conclusions drawn from our main regression models. This validation reinforces the validity of our research outcomes, providing further confidence in the robustness of our empirical findings.

[Table 9 about here]

5.3. Clustering by Firm ID and Country Code

To further assess the generalizability of our findings and account for potential unobserved heterogeneity at both the firm and country level, we employ random effects logistic regressions with clustering by firm ID and country code. This approach addresses potential concerns about factors specific to a firm or country that might influence the likelihood of financial distress but are not explicitly included in the model. The results validate our main regressions in both cases and for the three hypotheses. These results of the random effects logistic regression with firm

and country clustering demonstrate the generalizability of our findings across different countries and firm characteristics. Table 10 reports these results.

[Table 10 about here]

6. Discussion and Conclusion

This research sheds light on the connection between economic policy uncertainty, financial distress likelihood, the role of family ownership, and performance aspirations in European SMEs. Using a panel dataset across European SMEs over the period from 2012 to 2021, we find a clear link between increased EPU and a higher chance of financial distress for SMEs, highlighting the need for customized approaches during economic uncertainties. Our study supports the idea that SMEs, vital to local economies, face unique challenges when EPU is high. SMEs tend to adopt cautious financial strategies during uncertain economic times, making them more susceptible to financial difficulties. However, family-owned SMEs demonstrate resilience, suggesting that family ownership acts as a protective shield, mitigating the negative impact of EPU on financial stability. Moreover, our empirical evidence shows that family SMEs' performance above aspirations does not mitigate the impact of EPU on FDL. This counterintuitive effect can be understood through the lens of socioemotional wealth and mixed gamble theories. Family SMEs prioritize preserving SEW, including family control and emotional ties, leading them to remain cautious even when performing well above aspirations, as they fear potential threats to their socioemotional assets under uncertain conditions. Conversely, when performance falls below aspirations, the pressure to achieve financial stability might intensify their sensitivity to EPU, as they weigh potential socioemotional losses more heavily. Thus, regardless of performance levels, EPU significantly influences family SMEs' perception of financial distress likelihood, highlighting the dominance of socioemotional considerations over financial outcomes.

The study has important implications for policymakers responsible for shaping economic frameworks supporting SMEs. Recognizing the connection between EPU and financial distress calls for adjustments in policies to safeguard SMEs from different risks. Recognizing the resilience of family-owned SMEs, policies could be adjusted to strengthen family-controlled firms, fostering an environment that supports flexible strategies, and maintains long-term financial health.

As we conclude this study, opportunities for further exploration emerge. Future research could delve into the detailed categories of SMEs, investigating how varied sizes, sectors, and ownership structures respond to EPU. Additionally, expanding this inquiry globally could uncover region-specific variations, guiding policies tailored to diverse economic landscapes. In summary, our findings contribute to discussions on SME resilience, revealing the hurdles presented by economic uncertainties and the protective role of family ownership. Beyond this study, the implications resonate in boardrooms and policymaking arenas, urging a reevaluation of strategies to strengthen the foundation of the European economy.

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Figure 1 Research framework

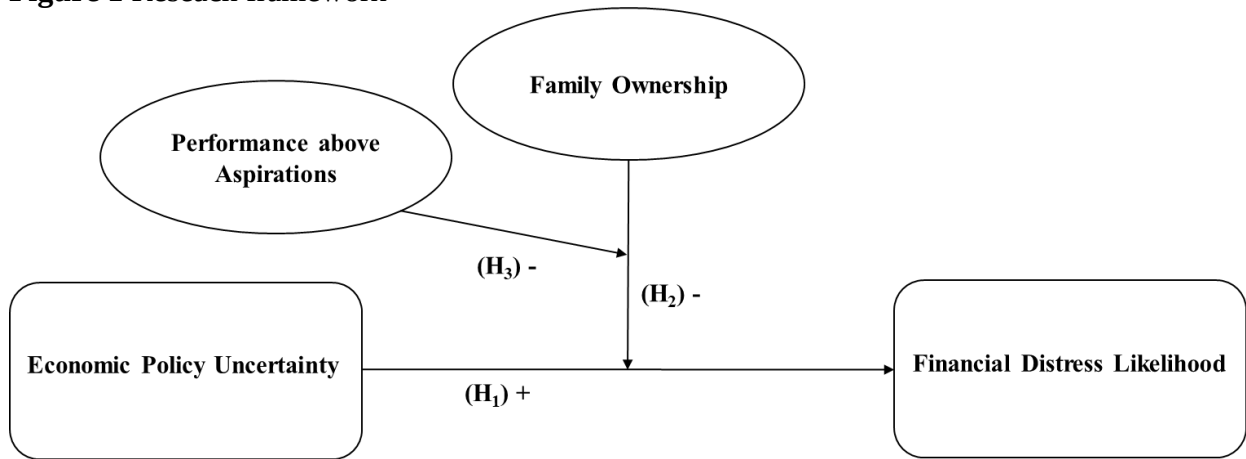


Figure 2 European economic policy uncertainty over time

This graph plots the European economic policy uncertainty index by Baker et al. (2016) covering our sample period.

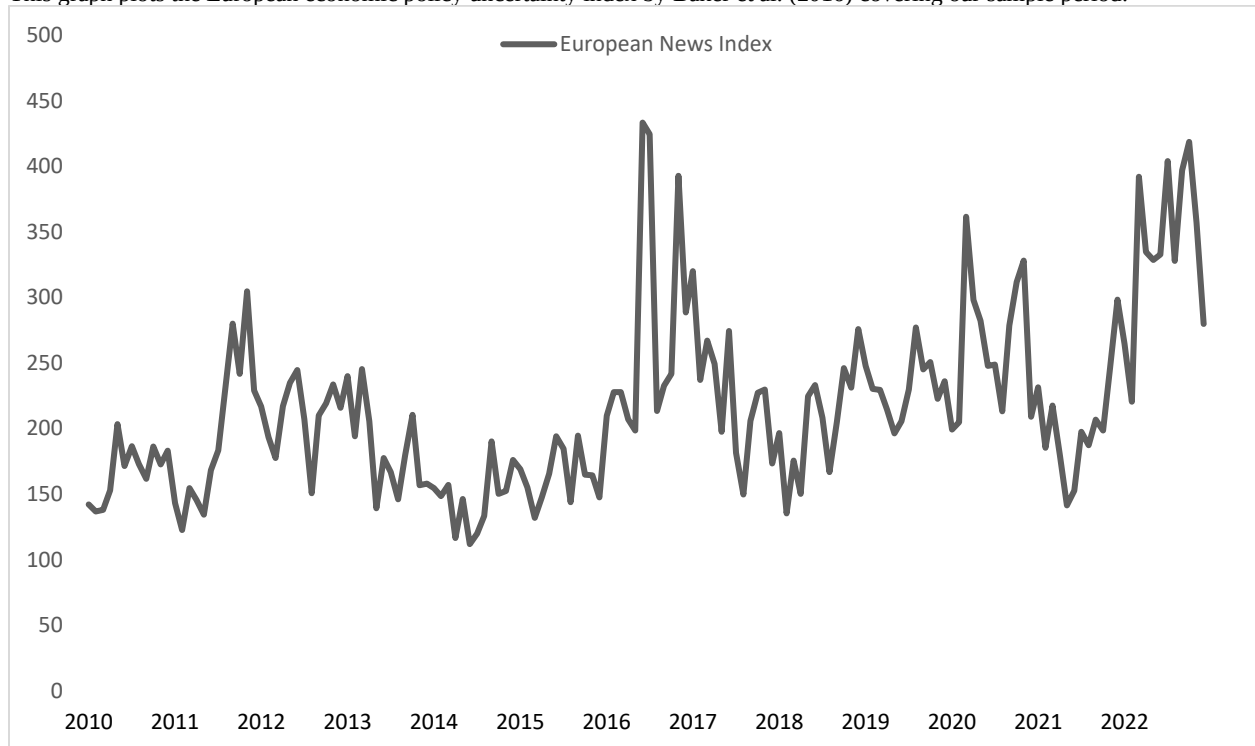


Table 1 Distribution of the sample by the financial distress and family firm status

Country	All firm-years	Number of Firms	Financial Distress Likelihood			Family-owned Firms		
			0	1	%	0	1	%
Italy	313,548	39,739	262,964	50,584	16%	121,602	191,946	61%
Spain	184,954	24,090	167,122	17,832	10%	98,863	86,091	47%
France	97,805	14,453	91,605	6,200	6%	52,153	45,652	47%
United Kingdom	103,761	13,870	96,297	7,464	7%	72,434	31,327	30%
Sweden	57,026	7,874	55,005	2,021	4%	54,342	2,684	5%
Portugal	56,525	7,241	48,495	8030	14%	26,694	29,831	53%
Romania	40,058	5,328	35,906	4152	10%	10,148	29,910	75%
Belgium	35,770	4,512	33,214	2,556	7%	32,116	3,654	10%
Poland	20,805	4,159	19,624	1,181	6%	10,071	10,734	52%
Czech Republic	27,062	3,840	25,548	1,514	6%	14,766	12,296	45%
Bulgaria	21,700	2,879	19,029	2,671	12%	6,714	14,986	69%
Germany	19,816	2,771	18,625	1,191	6%	15,629	4,187	21%
Finland	18,167	2,559	17,574	593	3%	10,093	8,074	44%
Hungary	17,213	2,213	16,039	1,174	7%	8,311	8,902	52%
Slovakia	15,012	2116	13,384	1628	11%	6,589	8423	56%
Greece	12,669	1,644	9,836	2,833	22%	4,227	8,442	67%
Croatia	12,459	1,610	11,057	1,402	11%	4,683	7,776	62%
Slovenia	12,248	1575	11,446	802	7%	4,360	7,888	64%
Latvia	8,400	1,085	7,605	795	9%	3,318	5,082	61%
Estonia	6,586	871	6,235	351	5%	2,956	3,630	55%
Ireland	4,613	689	4,247	366	8%	3,330	1,283	28%
Austria	2,548	445	2,453	95	4%	1,980	568	22%
Netherlands	274	43	256	18	7%	238	36	13%
Luxembourg	35	5	34	1	3%	29	6	17%
Total	1,089,054	145,611	973,600	115,454	11%	565,646	523,408	48%

Table 2 Summary statistics of main variables

Variables	All firm-years	Mean	SD	Minimum	P10	Median	P90	Maximum
Firm-level variables								
Financial Distress Likelihood	1,089,054	0.106	0.308	0.000	0.000	0.000	1.000	1.000
Family ownership	1,089,054	0.481	0.500	0.000	0.000	0.000	1.000	1.000
ROA change	1,089,054	0.001	0.065	-0.269	-0.070	0.000	0.071	0.305
Profitability (ROA)	1,089,054	0.107	0.094	-0.241	0.017	0.089	0.231	0.564
Tangibility	1,089,054	0.301	0.232	0.002	0.037	0.252	0.650	0.948
Leverage	1,089,054	0.594	0.243	0.057	0.250	0.610	0.898	1.734
Sales Growth	1,089,054	0.074	0.247	-0.570	-0.154	0.042	0.315	2.799
Ln (Firm Size)	1,089,054	8.711	0.974	5.515	7.507	8.661	10.032	14.873
Ln (Firm Age)	1,089,054	3.014	0.681	0.000	2.079	3.091	3.784	5.775
Country-level variables								
Ln (EPU)	1,089,054	5.118	0.418	4.149	4.665	5.097	5.616	6.297
Inflation	1,089,054	110.361	4.654	99.939	106.296	109.952	116.484	133.456
Ln (GDP per capita)	1,089,054	10.317	0.412	8.865	9.707	10.386	10.753	11.803
Change in exchange rate	1,089,054	1.016	0.071	0.930	0.957	0.996	1.132	1.229

Table 3 Correlation matrix of the main variables used in the regression analyses

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 FDL	1.000												
2 Ln (EPU)	-0.062***	1.000											
3 Family-owned firms	0.013***	-0.058***	1.000										
4 ROA change	-0.057***	-0.030***	-0.002*	1.000									
5 Profitability	-0.252***	0.048***	-0.039***	0.326***	1.000								
6 Sales growth	-0.054***	-0.084***	0.015***	0.299***	0.164***	1.000							
7 Tangibility	0.274***	-0.011***	0.044***	-0.002	-0.024***	-0.030***	1.000						
8 Leverage	0.305***	-0.105***	0.054***	0.015***	-0.245***	0.079***	-0.104***	1.000					
9 Ln (Firm size)	0.141***	0.113***	-0.232***	-0.018***	-0.110***	-0.004***	0.101***	-0.098***	1.000				
10 Ln (Firm age)	-0.026***	0.031***	-0.056***	-0.003***	-0.091***	-0.145***	0.028***	-0.210***	0.236***	1.000			
11 CPI	-0.039***	0.406***	-0.001	0.002	0.074***	0.015***	0.013***	-0.101***	0.082***	0.035***	1.000		
12 Ln (GDP per capita)	-0.036***	-0.073***	-0.216***	-0.003***	-0.006***	-0.043***	-0.164***	0.074***	0.200***	0.161***	-0.148***	1.000	
13 change in exchange rate	-0.001	-0.018***	-0.019***	0.002*	0.011***	-0.008***	0.002**	0.014***	-0.031***	-0.040***	-0.188***	-0.072***	1.000

***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively.

Table 4 Distribution of the sample across sectors and over time

Industry	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total	%
Agriculture	153	1,958	2,323	2,695	3,046	3,386	3,253	3,082	2,867	2,562	25,325	2%
Mining	38	540	643	718	779	854	812	754	682	612	6,432	1%
Construction	603	8,033	9,755	11,211	12,671	14,091	13,354	12,536	11,491	10,359	104,104	10%
Manufacturing	2,514	35,118	39,925	43,668	47,276	50,850	48,788	46,477	43,059	39,038	396,713	36%
Wholesale Trade	1,947	21,731	25,224	27,971	30,704	33,371	31,784	29,997	27,572	24,555	254,856	23%
Retail Trade	994	7,579	9,149	10,579	11,854	12,901	12,159	11,330	9,450	8,354	94,349	9%
Services	1,718	16,417	19,962	23,135	26,212	28,691	27,020	25,060	20,990	18,070	207,275	19%
Total	7,967	91,376	106,981	119,977	132,542	144,144	137,170	129,236	116,111	103,550	1,089,054	
Percentage (%)	1%	8%	10%	11%	12%	13%	13%	12%	11%	10%		100%

Table 5 Main results

Dependent variable: FDL	(1a) – H1 Coefficients	(1b) – H2 Odds ratios	(2a) – H3 Coefficients	(2b) – H1 Odds ratios	(3a) – H2 Coefficients	(3b) – H3 Odds ratios
Ln (EPU)	0.077*** (0.029)	1.080*** (0.031)	0.273*** (0.032)	1.314*** (0.042)	0.270*** (0.032)	1.310*** (0.042)
Family SMEs			2.156*** (0.118)	8.638*** (1.016)	2.104*** (0.119)	8.201*** (0.972)
Ln (EPU)*Family SMEs			-0.388*** (0.023)	0.679*** (0.016)	-0.377*** (0.024)	0.686*** (0.016)
ROA change					5.943*** (1.338)	381.105*** (509.883)
Ln (EPU)*ROA change					-0.749*** (0.260)	0.473*** (0.123)
Family SMEs*ROA change					-5.615*** (2.061)	0.004*** (0.008)
Ln (EPU)*Family SMEs*ROA change					1.069*** (0.404)	2.912*** (1.175)
Profitability	-16.551*** (0.086)	0.000*** (0.000)	-16.649*** (0.087)	0.000*** (0.000)	-17.305*** (0.093)	0.000*** (0.000)
Sales growth	-0.773*** (0.021)	0.462*** (0.010)	-0.775*** (0.021)	0.461*** (0.010)	-0.865*** (0.022)	0.421*** (0.009)
Tangibility	6.125*** (0.024)	456.970*** (10.742)	6.117*** (0.024)	453.275*** (10.673)	6.118*** (0.024)	453.753*** (10.698)
Leverage	8.254*** (0.032)	3843.993*** (121.884)	8.258*** (0.032)	3860.273*** (122.447)	8.219*** (0.032)	3709.819*** (117.850)
Ln (Firm size)	0.800*** (0.005)	2.226*** (0.011)	0.830*** (0.005)	2.294*** (0.012)	0.826*** (0.005)	2.285*** (0.012)
Ln (Firm age)	-0.027*** (0.007)	0.973*** (0.006)	-0.029*** (0.007)	0.972*** (0.006)	-0.037*** (0.007)	0.964*** (0.006)
CPI	0.026*** (0.003)	1.027*** (0.004)	0.025*** (0.003)	1.025*** (0.004)	0.024*** (0.003)	1.025*** (0.004)
Ln (GDP per capita)	-0.475*** (0.121)	0.622*** (0.075)	-0.405*** (0.121)	0.667*** (0.081)	-0.396*** (0.121)	0.673*** (0.081)
Change in exchange rate	-0.971*** (0.272)	0.379*** (0.103)	-1.264*** (0.273)	0.283*** (0.077)	-1.362*** (0.274)	0.256*** (0.070)
Constant	-14.624***	0.000***	-16.222***	0.000***	-16.032***	0.000***

	(1.218)	(0.000)	(1.222)	(0.000)	(1.223)	(0.000)
Number of observations	1,089,054	1,089,054	1,089,054	1,089,054	1,089,054	1,089,054
Number of firms	145,611	145,611	145,611	145,611	145,611	145,611
Pseudo R ²	0.503	0.503	0.504	0.504	0.505	0.505

This table presents the coefficients (odds ratios) from the logit regression results and their robust standard errors (in parentheses). Columns 1a, 2a, and 3a (1b, 2b, and 3b) report the estimated coefficients (odds ratios). ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively. All variables are defined in the Data and Methods section. All models include country, industry, and year fixed effects.

Table 6 Robustness check: World Uncertainty Index

Dependent variable: FDL	(1) – H1 Coefficients	(2) – H2 Coefficients	(3) – H3 Coefficients
World Uncertainty Index (WUI)	0.124** (0.052)	0.296*** (0.058)	0.296*** (0.058)
Family SMEs		0.341*** (0.021)	0.341*** (0.021)
Ln (EPU)*Family SMEs		-0.459*** (0.063)	-0.440*** (0.064)
ROA change			2.114*** (0.223)
Ln (EPU)*ROA change			-0.245 (0.616)
Family SMEs*ROA change			-0.578* (0.343)
Ln (EPU)*Family SMEs*ROA change			1.963* (1.019)
Profitability	-16.563*** (0.087)	-16.669*** (0.087)	-17.333*** (0.093)
Sales growth	-0.771*** (0.021)	-0.773*** (0.021)	-0.862*** (0.022)
Tangibility	6.122*** (0.024)	6.113*** (0.024)	6.113*** (0.024)
Leverage	8.245*** (0.032)	8.253*** (0.032)	8.212*** (0.032)
Ln (Firm size)	0.799*** (0.005)	0.826*** (0.005)	0.822*** (0.005)
Ln (Firm age)	-0.027*** (0.007)	-0.030*** (0.007)	-0.038*** (0.007)
CPI	0.024*** (0.004)	0.025*** (0.004)	0.025*** (0.004)
Ln (GDP per capita)	-0.383*** (0.121)	-0.408*** (0.122)	-0.399*** (0.122)

Change in exchange rate	-0.803*** (0.257)	-0.880*** (0.258)	-0.959*** (0.258)
Constant	-15.099*** (1.219)	-15.206*** (1.222)	-15.058*** (1.223)
Number of observations	1,082,433	1,082,433	1,082,433
Number of firms	144,785	144,785	144,785
Pseudo R ²	0.502	0.503	0.504

This table presents the coefficients from the logit regression results and their robust standard errors (in parentheses). ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively. All variables are defined in the Data and Methods section. All models include country, industry, and year fixed effects.

Table 7 Robustness check: Family Management

Dependent variable: FDL	(1) – H2 Coefficients	(2) – H3 Coefficients
Ln (EPU)	0.180*** (0.031)	0.178*** (0.031)
Family Management	1.502*** (0.121)	1.457*** (0.122)
Ln (EPU)*Family Management	-0.269*** (0.024)	-0.259*** (0.024)
ROA change		4.967*** (1.216)
Ln (EPU)*ROA change		-0.559** (0.236)
Family Management*ROA change		-4.509** (2.222)
Ln (EPU)*Family Management*ROA change		0.841* (0.437)
Profitability	-16.630*** (0.087)	-17.287*** (0.093)
Sales growth	-0.774*** (0.021)	-0.864*** (0.022)
Tangibility	6.116*** (0.024)	6.117*** (0.024)
Leverage	8.257*** (0.032)	8.217*** (0.032)
Ln (Firm size)	0.821*** (0.005)	0.817*** (0.005)
Ln (Firm age)	-0.030*** (0.007)	-0.039*** (0.007)
CPI	0.025*** (0.003)	0.025*** (0.003)
Ln (GDP per capita)	-0.431***	-0.423***

Change in exchange rate	(0.121) -1.132***	(0.121) -1.228***
Constant	(0.273) -15.518***	(0.274) -15.334***
Number of observations	(1.221) 1,089,054	(1.222) 1,089,054
Number of firms	145,611	145,611
Pseudo R ²	0.504	0.504

This table presents the coefficients from the logit regression results and their robust standard errors (in parentheses). ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively. All variables are defined in the Data and Methods section. Both models include country, industry, and year fixed effects.

Table 8 Robustness check: Sales Social Change

Dependent variable: FDL	(1) – H3 Coefficients
Ln (EPU)	0.098** (0.045)
Family SMEs	0.366** (0.168)
Ln (EPU)*Family SMEs	-0.095*** (0.034)
Sales change	-4.381*** (0.135)
Ln (EPU)*Sales change	-0.090*** (0.027)
Family SMEs*Sales change	-0.525*** (0.182)
Ln (EPU)*Family SMEs*Sales change	0.096*** (0.036)
Profitability	-15.682*** (0.130)
Sales growth	-0.336*** (0.023)
Tangibility	4.947*** (0.032)
Leverage	16.128*** (0.075)
Ln (Firm size)	5.006*** (0.026)
Ln (Firm age)	0.012 (0.009)
CPI	0.028*** (0.005)
Ln (GDP per capita)	-0.110

Change in exchange rate	(0.183) -0.548
Constant	(0.445) -60.491***
Number of observations	(1.846) 1,089,054
Number of firms	145,611
Pseudo R ²	0.716

This table presents the coefficients from the logit regression results and their robust standard errors (in parentheses). ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively. All variables are defined in the Data and Methods section. The model includes country, industry, and year fixed effects.

Table 9 Robustness check: Panel Data

Dependent variable: FDL	(1) – H1 Coefficients	(2) – H2 Coefficients	(3) – H3 Coefficients
Ln (EPU)	0.177*** (0.057)	0.325*** (0.068)	0.310*** (0.068)
Family SMEs		2.245*** (0.335)	2.179*** (0.338)
Ln (EPU)*Family SMEs		-0.289*** (0.066)	-0.271*** (0.066)
ROA change			10.219*** (2.826)
Ln (EPU)*ROA change			-1.183** (0.550)
Family SMEs*ROA change			-10.525** (4.361)
Ln (EPU)*Family SMEs*ROA change			1.967** (0.854)
Profitability	-42.044*** (0.382)	-42.182*** (0.383)	-44.710*** (0.430)
Sales growth	-1.895*** (0.042)	-1.900*** (0.042)	-2.054*** (0.044)
Tangibility	14.339*** (0.132)	14.311*** (0.131)	14.316*** (0.132)
Leverage	22.564*** (0.218)	22.558*** (0.217)	22.450*** (0.217)
Ln (Firm size)	2.828*** (0.031)	2.900*** (0.031)	2.920*** (0.032)
Ln (Firm age)	-0.145*** (0.030)	-0.152*** (0.030)	-0.181*** (0.030)
CPI	0.045*** (0.009)	0.044*** (0.009)	0.044*** (0.009)
Ln (GDP per capita)	-1.741*** (0.309)	-1.704*** (0.308)	-1.680*** (0.310)

Change in exchange rate	-0.951*	-1.162**	-1.226**
	(0.497)	(0.500)	(0.503)
Constant	-39.539***	-41.226***	-41.165***
	(3.161)	(3.165)	(3.182)
Number of observations	1,089,054	1,089,054	1,089,054
Number of firms	145,611	145,611	145,611

This table presents the coefficients from the panel data logit regression with random effects and their firm-clustered robust standard errors (in parentheses). ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent level, respectively. All variables are defined in the Data and Methods section. All models include country, industry, and year fixed effects.

Table 10 Robustness check: Cluster by Firm ID and Country Code

Dependent variable: FDL	(1) – H1 Coefficients	(2) – H2 Coefficients	(3) – H3 Coefficients	(4) – H1 Coefficients	(5) – H2 Coefficients	(6) – H3 Coefficients
Ln (EPU)	0.077*** (0.026)	0.273*** (0.033)	0.270*** (0.033)	0.077** (0.039)	0.273*** (0.062)	0.270*** (0.061)
Family SMEs		2.156*** (0.202)	2.104*** (0.204)		2.156*** (0.639)	2.104*** (0.638)
Ln (EPU)*Family SMEs		-0.388*** (0.040)	-0.377*** (0.040)		-0.388*** (0.125)	-0.377*** (0.125)
ROA change			5.943*** (1.256)			5.943*** (1.709)
Ln (EPU)*ROA change			-0.749*** (0.244)			-0.749** (0.329)
Family SMEs*ROA change			-5.615*** (1.933)			-5.615*** (2.091)
Ln (EPU)*Family SMEs*ROA change			1.069*** (0.379)			1.069*** (0.409)
Profitability	-16.551*** (0.138)	-16.649*** (0.139)	-17.305*** (0.157)	-16.551*** (1.696)	-16.649*** (1.707)	-17.305*** (1.890)
Sales growth	-0.773*** (0.022)	-0.775*** (0.022)	-0.865*** (0.023)	-0.773*** (0.071)	-0.775*** (0.070)	-0.865*** (0.085)
Tangibility	6.125*** (0.045)	6.117*** (0.045)	6.118*** (0.045)	6.125*** (0.415)	6.117*** (0.410)	6.118*** (0.412)
Leverage	8.254*** (0.059)	8.258*** (0.059)	8.219*** (0.059)	8.254*** (0.752)	8.258*** (0.746)	8.219*** (0.739)
Ln (Firm size)	0.800*** (0.010)	0.830*** (0.010)	0.826*** (0.010)	0.800*** (0.055)	0.830*** (0.052)	0.826*** (0.052)
Ln (Firm age)	-0.027** (0.013)	-0.029** (0.013)	-0.037*** (0.013)	-0.027 (0.047)	-0.029 (0.047)	-0.037 (0.045)
CPI	0.026*** (0.004)	0.025*** (0.004)	0.024*** (0.004)	0.026** (0.012)	0.025** (0.012)	0.024** (0.012)
Ln (GDP per capita)	-0.475*** (0.138)	-0.405*** (0.139)	-0.396*** (0.139)	-0.475 (0.349)	-0.405 (0.332)	-0.396 (0.330)
Change in exchange rate	-0.971*** (0.211)	-1.264*** (0.214)	-1.362*** (0.215)	-0.971*** (0.281)	-1.264*** (0.274)	-1.362*** (0.293)
Constant	-14.624***	-16.222***	-16.032***	-14.624***	-16.222***	-16.032***

	(1.404)	(1.411)	(1.414)	(3.677)	(3.384)	(3.388)
Number of observations	1,089,054	1,089,054	1,089,054	1,089,054	1,089,054	1,089,054
Number of firms	145,611	145,611	145,611	145,611	145,611	145,611
Pseudo R ²	0.503	0.504	0.505	0.503	0.504	0.505

This table presents the coefficients from the logit regression results, with columns 1, 2, and 3 reporting firm-clustered standard errors, and columns 4, 5, and 6 reporting country-clustered standard errors (robust standard errors in parentheses). ***, **, and * indicate significance at the 1 percent, 5 percent, and 10 percent levels, respectively. All variables are defined in the Data and Methods section. All models include country, industry, and year fixed effects.

Appendix 1 Definition of variables

Variables	Definition	Source	Frequency
Firm-level variables			
Financial Distress Likelihood	Indicator of financial distress taking the value of one if Z-Score is below 1.23, and zero otherwise.	(Altman, 2013; Altman & Sabato, 2007)' Altman et al. (2017)	Yearly
Family Ownership	Indicator variable equal to one for firm year observations in which an individual or a family controls at least 50% of voting rights of a firm, and zero otherwise.	Orbis Europe by BvD	Yearly
Performance above Historical Aspirations	The difference between a firm's current earnings before interest, taxes, depreciation, and amortization (EBITDA) relative to total assets compared to the previous year.	Orbis Europe by BvD	Yearly
Profitability	Earnings before depreciation, interests, and taxes, (EBIT), divided by the book value of total assets.	Orbis Europe by BvD	Yearly
Leverage	Total debt divided by the book value of total assets.	Orbis Europe by BvD	Yearly
Tangibility	Property, plant, and equipment divided by the book value of total assets.	Orbis Europe by BvD	Yearly
Sales Growth	Logarithm of net sales or revenues divided by last net sales or revenues from previous fiscal year.	Orbis Europe by BvD	Yearly
Firm Size	Logarithm of firm book value of total assets.	Orbis Europe by BvD	Yearly
Firm Age	Logarithm of firm age in years. Age is defined as the difference between the current calendar year and the year of incorporation.	Orbis Europe by BvD	Yearly
Country-level variables			
EPU	Logarithm of the standardized monthly European and Country-specific policy uncertainty index by Baker, Bloom and Davis (2016).	www.policyuncertainty.com	Yearly
Inflation (CPI)	The consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used. Data are period averages.	World Development Indicators	Yearly
GDP per Capita	Logarithm of GDP per capita from World Bank.	World Development Indicators	Yearly
GDP Growth	GDP annual growth from World Bank.	World Development Indicators	Yearly
Change in Exchange Rate	Yearly average change of domestic exchange rate to USD divided by last year average domestic exchange rate to USD, data from World Bank.	World Development Indicators	Yearly
Additional variables			
WUI	The World Uncertainty Index measured as the frequency of the term "world uncertainty" (or its variants) in Economist Intelligence Unit (EIU) country reports and are normalized by the total number of words and rescaled by multiplying by 1,000.	Ahir et al. (2022)	Yearly
Family Management	Indicator variable equal to one for firm-year observations in which the family owns at least 50% of the voting rights and the global ultimate owner is also a manager, and zero otherwise.	Orbis Europe by BvD	Yearly
Performance above Social Aspirations	The difference between a firm's natural logarithm of net sales and the median natural logarithm of net sales within its industry for the same year.	Orbis Europe by BvD	Yearly