Financing Costs and Credit Rating Changes of Family-Owned Firms Under Varying Market Stress

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Abstract

We study the financing costs and credit rating changes of family-owned firms during varying levels of market stress. We examine the bond spreads of 5,186 bond issuances and the credit rating changes of 699 bond issuers in the S&P 1500 from 1995 to 2018. Our findings show that the impact of family ownership on the cost of debt financing is dependent on the level of financial market stress. We show that family-owned firms are associated with lower financing costs during times of below-average market stress and higher financing costs during years of financial crisis compared to non-family-owned firms. We also test whether this change in the cost of debt for family-owned firms is reflected in a change in the bond issuers' corporate credit rating. Our results suggest that family-owned firms are more likely to receive a rating downgrade during years of above-average market stress and crisis compared to non-family-owned firms. The results are in line with the concept of a mixed gamble, with family-owned firms acting risk-averse in a stable external environment and risk-seeking in times of a distressed external environment.

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1 Introduction

Family owners differ from other types of shareholders (Villalonga & Amit, 2020) and can impact the agency costs of debt of family-owned firms (Anderson et al., 2003; Boubakri & Ghouma, 2010). However, a growing stream of research indicates that the risk-return trade-off of family firms is not stable across time, but rather follows the concept of a mixed gamble, with family firms acting risk-averse in stable times and risk-seeking in distressed times (Gomez-Mejia et al., 2022; Berrone et al., 2012). This study sheds light on the corporate financing costs and changes in credit ratings of family-owned firms over the varying phases of market stability and market stress of the financial cycle. It is relevant for the decision making of both family owners and investors since the credit profile and financing conditions of family-owned firms not only significantly impact the long-term growth potential, but also have far-reaching implications for strategic choices such as international expansions, acquisitions, and the timing of the family succession (Michiels & Molly, 2017).

Family ownership is a common type of firm ownership across the world (Claessens et al., 2000; Faccio & Lang, 2002; Anderson & Reeb, 2003a) and family-owned firms have distinct ownership characteristics (Bertrand & Schoar, 2006). Yet, evidence on the agency costs of corporate debt and corporate credit ratings for family firms is mixed, with some studies suggesting that family firms receive lower credit spreads (Anderson et al., 2003) and get better access to corporate credit (D'Aurizio et al., 2015; Stacchini & Degasperi, 2015) compared to non-family firms, while other studies indicate that family firms are associated with higher credit spreads (Boubakri & Ghouma, 2010; Lin et al., 2011), higher credit restrictions (Murro & Peruzzi, 2019), and less favourable corporate credit ratings (Boubakri & Ghouma, 2010).

This paper examines the bond spreads and credit rating changes of family-owned firms while distinguishing between the level of market stress across different phases of the financial cycle. We perform various cross-sectional regression analyses for a sample of 5,186 bonds that were issued between 1995 to 2018 by 699 issuers in the S&P 1500. We expect that the impact of family ownership on the agency costs of debt is dependent on the condition of financial markets. We also perform a logit panel data regression analysis for the 10,074 firm-years of the 699 bond issuers to examine the credit rating changes of family-owned firms. We expect that a change in the risk appetite of family-

owned firms during times of distress as compared to times of stability is reflected in changes in the firm's credit rating.

Debtholders determine the pricing of the debt instrument in line with their primary credit risk concerns, which are related to moral hazard and the costs of adverse selection (Jensen & Meckling, 1976). Those implicit costs arise from the conflicts of interest and divergent risk appetite of the firm's management, shareholders, and debtholders (Jensen & Meckling, 1976; Myers, 1977). As compared to other shareholder groups, family owners are not only concerned with the economic returns of their equity stake, but also their socioemotional wealth related to their position of power in the business, their emotional attachment to the firm legacy and their reputation as business owners (Berrone et al., 2012). Prior research developed the concept of a mixed gamble[1] for family firms based on the behavioural agency model (BAM) and the socioemotional wealth theory (SEW) (Gomez-Mejia et al., 2014; Gomez-Mejia et al., 2022). In essence, family-owned firms form corporate decisions by balancing the expected gains and losses associated with the two dimensions of financial and socioemotional returns (Gomez-Mejia et al., 2018; Hussinger & Issah, 2019). Yet, the risk trade-off is likely not stable, with prior research suggesting that family firms act risk-averse in times of stability and risk-seeking in times of distress (Gomez-Mejia et al., 2022). In normal times of stability, family-owned firms may not be willing to put their socioemotional wealth at risk to pursue additional economic return potential (Gomez-Mejia et al., 2022). Hence, family-owned firms may rather follow a more risk-averse corporate strategy as compared to non-family-owned firms to safeguard their existing economic and socioemotional wealth (Gomez-Mejia et al., 2022). This preference for risk-aversion, in combination with the various characteristics of family owners, including their deep involvement in the family firm, their reputational concerns, and their social capital with key stakeholders, may reduce the risks of agency conflicts for debtholders during normal stable times and, hence, could decrease the cost of financing for family-owned firms (Anderson et al., 2003). In particular, family owners often take decisions with a long investment horizon and also usually intend to transfer their equity stake to the next generation (Bertrand & Schoar, 2006). Therefore, in contrast to other shareholders,

[1] A mixed gamble refers to situations where a decision is associated with both expected gains and expected losses, as opposed to a pure gamble which is associated with only either expected gains or expected losses (Gomez-Mejia et al., 2022).

family owners tend to be committed to the longstanding survival of the firm instead of a focus on immediate return maximization (Anderson et al., 2003). Family owners are also often actively involved in the family-owned firm with a position in the management or the board of directors (Anderson & Reeb, 2003a). Therefore, family owners are usually able to actively impact the firm's operations (Anderson & Reeb, 2003a) and may be able to mitigate problems of management myopia (Stein, 1989). Furthermore, family owners are likely to build close relationships with the family firm's stakeholders (Berrone et al., 2012). The long-term relationship of family owners with debtholders may serve as a track record which may reduce information asymmetries for debtholders. In addition, family owners are particularly concerned about reputational damages (Burkart et al., 2003) since their family reputation is closely related to the family firm.

However, an external shock of a financial crisis can destabilize the operations of a firm and can negatively impact the survivability of the firm (Lins et al., 2013). In contrast to other types of shareholders, family owners are more reliant on the firms' performance since their concentrated stake in the family firm often makes up a large proportion of their overall wealth (Anderson & Reeb, 2003a). The risks introduced by market stress not only endanger the concentrated equity stake of the family owners, but also their socioemotional endowment related to their position of influence within the firm, their family reputation, and their attachment to the firm legacy (Gomez-Mejia et al., 2007; Berrone et al., 2012). Therefore, times of financial market stress may change the reference point of family owners with a shift towards framing their decisions in terms of a loss mode and therefore, family firms may adopt a higher risk appetite in order to secure both financial and socioemotional returns (Gomez-Mejia et al., 2022). Through their close involvement in the management, family owners could implement strategic choices at the expense of debtholders to preserve their position of control and the associated socioemotional benefits (Kellermanns et al., 2012). Against this backdrop, Lins et al. (2013) show that family firms cut their investments compared to non-family firms to deal with a liquidity shock during the great financial crisis. The changing risk appetite and incentives of family owners during an economic environment of crisis likely result in higher agency costs of debt and higher bond prices for family-owned firms. This change in the agency costs of debt of family-owned firms would likely also impact the corporate credit rating stability of family-owned firms over the economic cycle.

Our findings show that the impact of family ownership on financing costs depends on the condition of the financial market. Our results indicate that over the entire 24-year sample period, the impact of family-owned firms on bond spreads is negative, albeit not significant. Yet, when accounting for market stress, family-owned firms have 11.6 basis points lower spreads compared to non-family-owned firms for bonds that were issued during times of below-average market stress and non-crisis years. With an average bond issuance size of 560m USD, this corresponds to on average ca. 0.67m USD lower annual interest costs per bond. On the average total outstanding debt of 12.9bn USD of the bond issuers, a reduction of financing costs of 11.6 basis points for the entire outstanding debt would correspond to 14.91m USD annual cost savings. Our findings indicate that the characteristics of family ownership, which include the long-term investment horizon, active participation in management, long-term social relationships with creditors, and reputational concerns, are associated with lower costs of debt during stable times.

On the contrary, our results show that family-owned firms have 18 basis points higher bond spreads compared to non-family-owned firms during years of financial crisis, which is equivalent to on average USD 1.06m higher annual interest cost per bond issuance. However, our results also indicate that during crisis years family-owned firms are more like to issue a bond after a rating downgrade. The higher bond spreads during crisis years appear to be driven by this issuance behaviour. Against this backdrop, we further examine the stability of the corporate credit ratings of the bond issuers and find that family-owned firms are more likely to get downgraded compared to non-family-owned firms during crisis years. The odds of family-owned firms to get downgraded during crisis years is 79 percent higher than for non-family-owned firms. Our findings provide evidence that the agency costs of debt associated with family ownership are not homogeneous over time and change when the company is exposed to the financial market cycle.

Our findings contribute to the existing literature on the cost of financing for publicly listed family firms (Anderson et al., 2003, Boubakri & Ghouma, 2010, Lin et al., 2011) in several ways. Firstly, our sample period spans through several economic cycles. This extensive sample period enables us to distinguish between years of market stress and financial crisis to analyse whether the agency costs of debt for family-owned firms vary

for different macroeconomic environments. Secondly, we extend the research on credit ratings of family-owned firms (Boubakri & Ghouma, 2010) by examining the credit rating stability of family-owned firms. A variation of the agency costs of debt of family-owned firms with market stress would likely be observed in the stability of credit ratings. Thirdly, we add to the literature stream on the concept of a mixed gamble for family firms by extending the context to corporate financing. Fourthly, we focus our analysis on bond spreads at issuance[2] to shed light on the actual financing costs of raising bond financing for family-owned firms.

2 Theoretical Background

The primary concerns of debtholders are often related to the costs of adverse selection and moral hazard due to conflicts of interest and divergent risk-return profiles of various stakeholders. Agency conflicts for debtholders could arise in a variety of situations where either management acts in their own self-interest, which may harm both shareholders and debtholders, or shareholders act at the expense of debtholders (Jensen & Meckling 1976). In particular, creditors are vulnerable to the asset substitution problem where the firm takes on higher-risk projects after the financing is arranged. Those projects could significantly increase the downside risks to debtholders while providing upside potential to shareholders (Jensen & Meckling, 1976; Myers, 1977). Consequently, debtholders price the debt instrument accordingly to compensate for the indirect monitoring costs associated with agency conflicts as well as the direct costs related to moral hazard and adverse selection risks (Myers, 1977).

Family firms constitute a considerable proportion of firms (Claessens et al., 2000; Faccio & Lang, 2002; Anderson & Reeb, 2003a). Prior research indicates that certain characteristics of family firms can be associated with less severe manager-shareholder type I agency conflicts (Villalonga et al., 2015). The family owners often have a close involvement in the firm's strategic decision-making and are likely to align the incentives of the management team (Anderson et al., 2003). However, research also indicates that the type II agency conflicts between majority shareholders and minority shareholders may be higher (Villalonga et al., 2015). Family owners can misuse their close involvement in the decision-making to extract personal benefits (Villalonga et al., 2015;

[2] Anderson et al. (2003) use the annual weighted average spreads of outstanding bonds of the firm.

Kellermans et al., 2012). Yet, there is only limited research on the type III agency conflicts of family firms with other stakeholders such as creditors (Villalonga et al., 2015).

For both private and public firms, family firms represent a distinct organizational type with a unique governance structure and firm characteristics (Anderson & Reeb, 2003). Founding family ownership is associated with certain characteristics that differ compared to other types of blockholders (Bertrand & Schoar, 2006). Family owner's private financial wealth is often closely tied to their concentrated equity position in the family-owned firm (Anderson et al., 2003). Compared to other shareholders, family owners, therefore, tend to be more reliant on the solid performance of the family firm. In addition to financial return, family owners also hold socioemotional endowment in the family firm, which relates to the emotional connection to the firm, the reputational gains associated with their legacy, and their position in the firm (Gomez-Mejia et al., 2007; Berrone et al., 2012). According to the mixed gamble concept, which is built on the behavioural agency model (BAM) and the socioemotional wealth theory (SEW) (Gomez-Mejia et al., 2014), family firms form decisions based on the expected gains and losses in terms of both the economic return dimension as well as the socioemotional return dimension, which are often at odds with each other (Hussinger & Issah, 2019; Gomez-Mejia et al., 2018). However, prior research also suggests that this trade-off of the two dimensions varies over time, with family firms preferring a risk-averse approach in normal, stable times and a risk-seeking approach in distressed times (Gomez-Mejia, 2022).

In stable times, family-owned firms are likely to not put their socioemotional wealth at risk in the pursuit of unknown additional financial returns. Rather, family firms are likely to protect their existing socioemotional and economic wealth by implementing a safer risk-averse corporate strategy (Gomez-Mejia, 2022). The combination of this risk-averse preference together with various distinguishing characteristics of family-owned firms may reduce the agency costs of debt for creditors. In contrast to other shareholders, family owners follow a longer investment term and often fulfil a dual role as shareholders and firm managers (Bertrand & Schoar, 2008). The long-term focus may reduce conflicts of interest between family owners and bondholders since family owners are likely to concentrate on the long-term survival of the firm over a short-term

maximization of returns (Anderson et al., 2003). Through the close involvement in the management or board (Anderson & Reeb, 2003), family owners are often also operationally able to reduce problems of management myopia (Stein, 1989) to gear the long-term strategic focus of the firm and to build prolonged relationships with key stakeholder groups (Berrone et al. 2012; Anderson et al., 2003). In particular, the long-term relationship between family owners and debtholders is likely based on various transactional interactions that may serve as a track record for future transactions (Chua et al., 2011). Besides, family owners also tend to be concerned about reputational costs since their family reputation is strongly impacted by reputational damage to the family firm (Burkart et al., 2003). In line with reputational concerns, accounting research shows that family firms report better quality of earnings (Wang, 2006; Ali et al., 2007) and give more earnings warnings compared to non-family firms (Chen et al., 2008). The social capital of family owners and the timelier reporting of family-owned firms may reduce the information asymmetries for debtholders and may foster trust between shareholders, management, and debtholders. In addition, debtholders may anticipate cross-selling opportunities for transactions with other professional or personal projects of the family owners. Overall, the preference for risk-aversion, the long-term active involvement in the family business, the reputational concerns, and the social ties of family owners are characteristics of family-owned firms that may reduce the risks of agency conflicts for debtholders and, hence, could decrease the pricing of bonds at issuance during normal times (Anderson et al., 2003).

Yet, an external economic shock of a financial crisis can severely impact a firm's operations (Lins et al., 2013). In the context of a financial crisis, family owners may convert to framing their decisions in terms of a loss mode since both their financial wealth as well as their socioemotional endowment may be suddenly at risk (Berrone et al., 2012). Hence, family firms may change towards a higher risk appetite to protect both financial and socioemotional return dimensions (Gomez-Mejia et al., 2022). Through their influence in management, family owners are directly able to effectively change the strategic direction of the firm (Anderson & Reeb, 2003). Prior research shows that family-owned firms may take actions at the expense of other stakeholders like debtholders in order to protect their socioemotional wealth and secure their position of control within the firm (Kellermanns et al., 2012; Mendez & Maciel, 2020). The changing behaviour during an environment of crisis may cause debtholders to demand

higher bond pricing. At the same time, the behaviour shift of family owners also likely impacts the stability of credit ratings during crisis years as compared to non-crisis years.

The existing literature on the corporate financing of family firms has not yet yielded uniform results. Several research papers suggest that family firms have lower credit spreads (Anderson et al., 2003) and better credit access (D'Aurizio et al., 2015; Stacchini & Degasperi, 2015). However, other findings indicate that family firms get higher credit spreads (Boubakri & Ghouma, 2010; Lin et al., 2011), lower corporate credit ratings (Boubakri & Ghouma, 2010), and higher credit restrictions (Murro & Peruzzi, 2019). Anderson et al. (2003) examine the agency costs of debt for family firms in the S&P 500 from 1993 to 1998. Their findings suggest that large, publicly listed family firms are associated with a lower cost of financing. The results indicate that bondholders perceive family firms as an ownership form that better aligns with their interests (Anderson et al., 2003). Boubakri and Ghouma (2010) analyse the impact of firm ownership on the cost of debt of yankee bonds for a cross-country sample of public firms in East Asia and Western Europe. Contrary to the findings of Anderson et al. (2003) for the US, Boubakri and Ghouma (2010) find that family ownership has a positive impact on bond spreads and a negative impact on bond ratings. Their findings indicate that bondholders are concerned with the risk of expropriation from family owners, who can misuse their position to maintain control or even extract personal benefits at the expense of debtholders (Boubakri & Ghouma, 2010).

With regard to corporate credit ratings, various streams of academic literature examine the determinants of credit ratings (Kaplan & Urwitz, 1979; Blume et al., 1998; Ashaugh-Skaife et al., 2006), the stability of credit ratings over the business cycle (Altman & Rijken, 2006; Amato & Furfine, 2004) and the informational content of credit ratings for capital markets (Kisgen & Strahan, 2010; Dichev & Piotroski, 2001). Credit rating agencies serve as informational intermediaries and issue ratings on both obligors as well as debt securities. A corporate credit rating represents the assessment of a credit rating agency regarding the creditworthiness of a firm and provides an assessment of the company’s ability and willingness to meet its financial obligations. Previous research shows that credit ratings have a substantial influence on capital structure decisions of firms (Kisgen, 2006; Graham & Harvey, 2001) and convey relevant information to financial markets (Kisgen & Strahan, 2010; Dichev & Piotroski,

2001). Credit rating agencies use public as well as private information to analyse quantitative financial as well as qualitative firm variables in order to form their credit risk assessment (Blume et al., 1998). A credit rating is based on an over-the-cycle approach and is meant to represent the long-term creditworthiness over several business cycles (Amato and Furfine, 2004). Prior academic research has analysed how various quantitative as well as qualitative factors impact credit ratings and shows that, to a certain degree, credit ratings can be replicated with public information (Kaplan & Urwitz, 1979). With regard to qualitative characteristics, research has examined various factors related to corporate governance and ownership structure (Bhojraj & Sengupta, 2003; Ashaugh-Skaife et al., 2006; Boubakri & Ghouma, 2010; Ghouma, 2017) as well as the quality of management (Kuang & Qin, 2013; Bonsall et al., 2017; Skousen et al., 2018; Liu & Jiraporn, 2010; Harper et al., 2019). Yet, there are only few academic papers on credit ratings of family-owned firms. Against that backdrop, Boubakri and Gouma (2010) examine whether family ownership has an impact on the credit rating for a sample of East Asian and Western European issuers. Their findings suggest that family ownership has a negative effect on bond credit ratings.

Our research aims to reconcile the evidence on the cost of bond financing of family-owned firms and extend the papers of Anderson et al. (2003) and Boubakri and Ghouma (2010) in several important ways. We build on the family firm literature by examining bond issuances over a sample period that encompasses several economic cycles to analyse the impact of family ownership during varying external market conditions. We also extend the existing research of family firms and credit ratings (Boubakri & Ghouma, 2010) by examining the stability of credit ratings. A variation of the agency costs of debt between normal times and crisis times would likely be reflected in both credit spreads and credit rating changes.

3 Sample Construction and Methodology

3.1 Data Sample

Our sample consists of bond issues of S&P 1500 firms ranging from 1995[3] to 2018. The sample period covers both the dot-com bubble and the great financial crisis, which

[3] The sample period starts in 1995 since the S&P 1500 was constructed for the first time in 1995, and the electronic Edgar database, which entails the company's proxy statements for the hand collection of family ownership data, was digitalized in 1994.

enables us to examine the full economic cycle with varying levels of market stress. We exclude companies in the financial industry with SIC codes 6020 to 6799 and utilities with SIC Codes 4812, 2813, 2911 to 2991 since those sectors have unique capital structures and corporate governance characteristics (Anderson et al., 2012b). The total sample comprises 5,186 bond issuances of 699 bond issuers in the S&P 1500 from 1995 to 2018.

In line with previous research on the financing of publicly-listed family firms (Anderson et al., 2003; Villalonga & Amit, 2020), our definition of a family-owned firm is a company where the founder or the family of the founder holds a minimum of 5% equity ownership in the firm[4]. We manually collect data on the equity stake of founding family owners based on the beneficial ownership disclosure in the firm's proxy statements from 1995 to 2018. In order to identify the family owners, we complement the proxy statements with several other sources detailing corporate history, namely Factiva, FundingUniverse.com, LexisNexis, and individual firm websites. The identification of founding families follows the methodology of Villalonga and Amit (2006). We cross-check the information from various sources to validate the correctness of the information. The family ownership is calculated as the aggregate number of shares of members of the family divided by the number of outstanding shares. For companies with a dual class share structure, the aggregate ownership percentage of all classes of shares is calculated. Furthermore, for the family-owned firms we collect data from proxy statements on whether the CEO of the family firm is the founder, a descendent of the founder, or an externally hired professional. Fundamental firm variables are collected from the Compustat database. Bond variables and S&P credit ratings are retrieved from Thomson Reuters.

Table 1 displays the distribution of the bond issuances by time period (panel A) and type (panel B). Of the total 5,186 bond issuances, 16 percent of bonds are issued by family-owned firms and 84 percent are issued by non-family-owned firms. Regarding the credit quality of the issuer, 78 percent of bonds are issued by investment-grade issuers and 22 percent by non-investment grade issuers. While 80 percent of non-family-owned bond issuers are investment-grade, only 69 percent of family-owned

[4] The 5% threshold is based on previous research and stems from the minimum reporting requirements of beneficial ownership in the proxy statements.

bond issuers are investment-grade, which indicates a difference in credit quality of family-owned and non-family-owned issuers. With respect to bond features, 45 percent of the total bond sample has a call option.

[Insert Table 1 here]

The primary dependent variable of our main analysis is the yield spread (in bps) at bond issuance (Spread). The variable represents the difference between the yield to maturity of the bond and the yield to maturity of a comparable treasury security. The primary independent variable is a dummy variable to represent family-owned firms (FamFirm). The variable takes a value of 1 for companies with members of the founding family holding an aggregate equity ownership stake of at least 5 percent. Following previous research, we include several control variables at issuer-level and bond-level (Anderson et al., 2003; Boubakri & Ghouma, 2010). We include the S&P long-term corporate credit rating of the issuer (Rating) as a control variable to test whether family ownership has an impact on bond spreads after accounting for the corporate credit quality. The numerical conversion of the S&P credit ratings is in line with Anderson et al. (2003) (displayed in Appendix 2). A credit rating of AAA corresponds to a numerical value of 22, and a credit rating of D is represented by a numerical value of 1. To further control for issuer-level characteristics, we include firm size (Firm Size) calculated as the natural logarithm of the total assets of the firm and firm performance (Perform) proxied by the ratio of cashflows to total assets. We also include firm leverage (Leverage) computed as the ratio of total debt to total capital, and firm risk calculated as the standard deviation of the cashflows scaled by the long-term debt during the preceding five years (Anderson et al., 2003). At the bond-level, we include the duration of the bond (Duration), the bond size (Issue Size) measured as the natural logarithm of the issue amount, and an option dummy variable (Call) that takes the value of 1 if the bonds are callable. All continuous variables in our analyses are winsorized at the 5% level.

Table 2 displays the summary statistics of bond issuances in panel A and bond issuers in panel B for the entire sample as well as the family-owned and non-family-owned subsamples. The bond issues of the full sample have an average yield spread of 196 basis points and an average duration of 7.5 years. The average bond issue amount is USD 581.5 million. The average issuer has a firm size of USD 25.6 billion and an

average credit rating of BBB+. In aggregate, without controlling for credit risk, the bonds of the subsample of family-owned firms have a higher average bond spread, lower average duration, and lower average bond issue size. This is consistent with the bond issuer characteristics. The family-owned bond issuers have a smaller average firm size, bigger average firm risk, and a lower average credit rating.

[Insert Table 2 here]

In order to construct subsamples, we classify each bond issuance according to whether it was issued during a time of market stress. The market stress variable is based on the St. Louis Fed Financial Stress Index. The index is based on seven interest rate indicators, six yield spread indicators, and five general indicators. The average value of the index since 1993 is set to 0, which represents a normal financial market condition. While values below 0 represent below-average market stress, values above 0 represent above-average market stress. We also classify each bond issuance according to whether it was issued during a year of financial crisis, which includes the years 2001-2003 for the dot-com bubble and 2007-2009 for the great financial crisis.

[Insert Figure 1 here]

Table 3 presents the univariate statistics for subsamples of bonds issued during below-average market stress and above-average market stress. Regarding the market stress subsamples, 63 percent of the total sample is issued during below-average market stress and 37 percent during above-average market stress[5]. Both the family-owned and non-family-owned bond issuers that issue during above-average market stress are on average smaller as compared to the bond issuers during below-average market stress. The issue size is on average smaller for family-owned firms in both subsamples, which is in line with the smaller firm size of family-owned firms. On a univariate basis, the spread is on average significantly higher, and the duration is significantly smaller for family-owned firms compared to non-family-owned firms only in the above-average market stress subsample.

[5] With regard to the crisis subsamples, 79 percent and 21 percent of the total sample is issued during non-crisis and crisis years, respectively.

[Insert Table 3 here]

Furthermore, we construct two dummy variables rating downgrade and rating upgrade. Those variables take the value of 1 if the bond issuer of the bond issuance was downgraded or upgraded respectively between the bond issuance date and the preceding financial year.

3.2 Methodology

We estimate an ordinary least squares regression to investigate the cross-sectional relationship between family ownership (FamFirm) and bond yield spreads (Spread) at issuance. We start with the following primary specification of our main model.

$$Spread_{i,t} = a + \beta_1(FamFirm_{i,t}) + \beta_2(Duration_{i,t}) + \beta_3(IssueSize_{i,t}) + \beta_4(FirmSize_{i,t-1}) + \beta_5(Leverage_{i,t-1}) + \beta_6(Perform_{i,t-1}) + \beta_7(Risk_{i,t}) + \beta_8(Rating_{i,t}) + \beta_9(Time_{i,t}) + \beta_{10}(Industry_{i,t}) + \varepsilon \quad (1)$$

The dependent variable of bond spread (Spread) is the difference between the yield to maturity of the bond at issuance minus the yield to maturity of a comparable treasury security. The main explanatory variable is a family firm dummy variable (FamFirm) that takes the value of 1 if the founding family holds an aggregate equity stake of at least 5%. We control for bond level characteristics by including the bond duration (Duration) and bond issue size (Issue Size). We further control for firm-level characteristics by including the firm size (Firm Size), firm leverage (Leverage), firm performance (Perform), firm risk (Risk), and corporate credit rating (Rating). The variables firm size, firm leverage, and firm performance are taken as per the year-end of the financial year prior to bond issuance. The regression further includes year fixed effects and industry fixed effects to have a control for trends in time and industry specific characteristics. The t-statistics that are reported in our regression tables are based on robust standard errors which are clustered at firm level.

Next, we perform the same regression analysis for subsamples of market stress and crisis years in order to examine the impact of family-owned firms on bond spreads during varying financial market environments. With respect to market stress, we divide

our sample into two subsamples, which represent bonds that were issued during below-average market stress and above-average market stress, respectively. Our analysis uses the St. Louis Fed Financial Stress Index as a proxy for market stress as described in the variables section. Furthermore, we also divide the sample into two subsamples according to whether the bonds were issued during crisis years or non-crisis years. Crisis years include the years 2001-2003 of the dotcom bubble and the years 2007-2009 of the great financial crisis. Next, we then examine the heterogeneity of family-owned firms by examining the subsample of family-owned firms in order to get a more granular understanding of our findings. The main explanatory variables refer to whether the company is led by the founder, a descendent of the founder, or by an externally hired CEO as well as the ownership stake of the family.

Furthermore, we investigate the likelihood of a bond issuance after a rating downgrade or rating upgrade, respectively. We perform this analysis to examine the issuer behaviour since credit spreads may be impacted by recent changes in credit ratings, which may also reflect changes in agency costs of debt for debtholders. We perform a cross-sectional logit regression analysis for our 5,186 bond issuances of the 699 bond issuers. Our dependent variable is a dummy variable that has the value of 1 if there is a rating downgrade (or upgrade, respectively) between the date of the bond issuance and the preceding financial year. The explanatory variable is family-owned firm, and the control variables are identical to our main analysis. Afterwards, we perform our main analysis again with additional control variables for rating downgrade and rating upgrade in order to re-examine our main analysis in the context of rating changes. The inclusion of credit rating changes in our analysis further prompts us to perform a separate add-on analysis of the panel data set of bond issuers to examine the credit rating changes of family-owned firms (the sample, methodology and results of this add-on analysis are detailed in part 4.2 of the results section).

4 Results

4.1 Main Analysis of Credit Spreads

We start by examining the impact of family ownership on bond spreads for the full sample and the subsamples of market stress and crisis. Table 4 displays the results of the cross-sectional regression analysis with bond spread at issuance (Spread) as the

dependent variable and the family ownership dummy (FamFirm) as the main explanatory variable. The first two columns show the results for the complete sample. Over the entire sample period, family-owned firms have a negative, but not significant, impact on bond spreads at issuance. In columns 3 and 4 the analysis is conducted for two subsamples of bonds that are issued during times of below-average market stress and above-average market stress. Our results show that family ownership is associated with significantly lower bond spreads at issuance during times of below-average market stress, which we also refer to as normal times. The economic impact of family ownership during below-average market stress is equivalent to 11.6 basis points lower bond financing costs. For the average issue size of our bond issuance sample of 560m USD, this amounts to ca. 0.67m USD lower annual interest costs per bond issuance. In terms of the average total outstanding debt of our sample bond issuers of 12.9bn USD, a 11.6 basis points lower financing cost of all outstanding debt would be equivalent to 14.91m USD. In column 5 and 6 we perform the regression for subsamples of bonds that were issued during crisis and non-crisis years. We observe that the negative relationship between family-owned firms and bond spreads also holds for non-crisis years. The results further indicate that family firms pay higher bond spreads during years of financial crisis. The economic impact of family ownership during crisis years amounts to 18 basis points higher financing costs. For the average issue size, this amounts to USD 1.06m higher annual interest costs per bond issuance. In terms of the average total outstanding debt of our sample bond issuers, an 18 basis points higher financing cost of all outstanding debt would be equivalent to an increased annual cost of 23.16m USD.

[Insert Table 4 here]

We further examine the subsample of family-owned firms in order to examine the heterogeneity of family-owned firms in table 5. We distinguish between family firms that are managed by the founder, the descendent or an external hire as the CEO, respectively. We perform the cross-sectional regression analysis for the entire sample as well as the subsamples for below- and above-average market stress. The results indicate that family firms that are led by the founder have lower bond spreads at issuance over the entire sample period. This effect seems to be largely driven by the

above-average market stress subsample, indicating that family-owned firms with founder CEO have lower bond spreads in times of above-average market stress as compared to the other types of family-owned firms.

[Insert Table 5 here]

Next, in table 6 we examine the likelihood for family-owned firms to place their bond issuance after a credit rating downgrade (panel A) or rating upgrade (panel B). We introduce this analysis of issuer behaviour since credit spreads could be driven by rating changes, which may in turn be reflecting changes in agency conflicts of debt. The dependent variable is a dummy variable that takes the value of 1 if the bond was issued after the bond issuer's rating downgrade. The results indicate that during years of financial crisis, family-owned firms are more likely to issue a bond after a rating downgrade as compared to non-family-owned firms.

[Insert Table 6 here]

Lastly, in table 7 we perform our main analysis again with two additional control variables rating downgrade and rating upgrade. The additional variables are dummy variables that take the value of 1 if the bond issuer was downgraded, or upgraded, respectively, between the bond issuance and the end of the last financial year. The coefficients for the below-average market stress and non-crisis samples in columns 3 and 5 are robust with a significantly negative coefficient, which is in line with our main analysis. However, the coefficient for the crisis subsample is not significant anymore. Our results in table 8 and table 9 indicate that the positive effect of family-ownership on bond spreads during crisis periods is driven by the issuance behaviour of family-owned firms after credit rating downgrades.

[Insert Table 7 here]

4.2 Analysis of Credit Rating Changes

Based on the previous results, we follow up with a separate analysis of the rating stability of our 699 bond issuers over the years 1995 to 2018. We expect that changes

in the agency conflicts of debt over the economic cycle could be reflected in credit rating changes and expect that family-owned firms are more likely downgraded during times of crisis.

Our sample consists of the 699 bond issuers of our main analysis over the years from 1995 to 2018, resulting in a 10,074 firm-year panel dataset. The table 8 displays the descriptive statistics of credit rating upgrades and credit rating downgrades of our sample firms from 1995 to 1998. The table gives an initial indication that there could be differences in the annual rating changes between family-owned firms and non-family-owned firms. Particularly during years of crisis and years of above-average market stress a higher percentage of family-owned firms appears to receive a downgrade as compared to non-family-owned firms.

[Insert Table 8 here]

The table 9 displays the results of the logit panel regression analysis to test the impact of family firms on the likelihood of a credit rating downgrade (panel A) or rating upgrade (panel B). The dependent variable is a dummy variable that takes the value of 1 if the S&P credit rating of the firm i is downgraded (panel A) or upgraded (panel B) in year t. The explanatory variable is a dummy variable that takes the value of 1 if the founding family has an equity stake in the firm of more than 5%. The explanatory and firm-level control variables are in line with the variables of our main analysis.

$$P_{Ratingdowngrade} = f\,(\,FamFirm,\quad Firm\,Size,\quad Leverage,\quad Risk,\quad Perform,\quad Rating,\quad Time,\quad Industry\,) \tag{2}$$

The column 1 and 2 display the results for the entire sample, while columns 3 and 4 represent the subsamples of market stress and columns 5 and 6 show the subsamples of crisis years. The subsamples of below-average and above-average market stress are formed based on the average St. Louis Fed Financial Stress Index of that year. The results indicate that family-owned firms are more likely to receive a rating downgrade as compared to non-family-owned firms. The subsample analysis further shows that the effect is largely driven by the above-average market stress and crisis year subsamples.

We conclude that the results indicate that family-owned firms are more likely to be downgraded during years of above-average market stress and financial crisis. The odds of family-owned firms to get downgraded during crisis years is 79 percent higher than for non-family-owned firms.

[Insert Table 9 here]

5 Robustness Tests

Our main analysis of credit spreads in Table 4 examines subsamples according to market stress as proxied by the St. Louis Fed Stress Index. As an alternative, our main analysis also examines subsamples according to crisis years and non-crisis years. As a robustness test, we introduce a third subsample analysis with the CBOE Volatility Index (VIX) as an alternative proxy. The VIX is based on the prices of S&P 500 index options and proxies the 30-day implied volatility. Investors commonly use it as a proxy for market fear. We form two subsamples according to whether the bond is issued during times of below-average and above-average VIX index levels. The regression results for the VIX subsamples are in line with our main analysis using the St. Louis Fed Stress Index (see appendix 7 and 8).

Our main analysis of credit spreads in Table 4 is based on cross-sectional linear regression analyses for subsamples of market stress and crisis. As an alternative approach, we perform our main analysis with interaction effects instead of subsamples to test the robustness of our results. The regression analysis with interaction effects underpins the findings with subsamples for the St. Louis Fed Financial Stress Index, crisis years and the VIX (see appendix 9). Furthermore, we also perform a regression analysis with a propensity score-matched sample in order to only include non-family-owned firms in our analysis that match the characteristics of the family-owned firms in our sample. We use the same set of control variables as our main analysis to conduct the propensity score matching. The results corroborate our primary findings (see appendix 11).

6 Conclusion

We examine the bond spreads and credit rating changes of family-owned and non-family-owned publicly listed firms. The extensive time horizon enables us to analyze the impact of family-ownership on bond spreads and credit rating changes during varying market environments. Our analysis shows that the relationship between family ownership and financing costs depends on the condition of the financial market. The results indicate that family-owned firms have lower financing costs for bonds that were issued during periods of below-average market stress. Our results show that only during periods of below-average market stress bondholders regard the organizational form of family-ownership as one with fewer agency costs of debt. For bonds issued during the years of the dotcom bubble and the great financial crisis, family-ownership is associated with higher financing costs. The findings also indicate that during years of financial crisis family-owned firms are more likely to issue a bond after a recent rating downgrade. Our results suggest that the higher bond spreads of family-owned firms during years of crisis seem to be driven by the bond issuance behaviour of family-owned firms of issuing a bond after a rating downgrade. We further examine the stability of corporate credit ratings. Our findings show that family-owned firms have a higher likelihood of receiving a rating downgrade during years of financial crisis and years of above-average market stress. This indicates that the agency costs of debt for family-owned firms compared to non-family-owned firms change over the financial cycle. Our results are consistent with prior research on the mixed gamble of family firms, where family firms are risk-averse during normal times and risk-seeking during distress (Gomez-Mejia et al., 2022).

Our analysis contributes to the literature on the financing costs of publicly listed family firms (Anderson et al., 2003; Boubakri & Ghouma, 2010), which has presented seemingly contrasting research results on the relation between family firms and bond spreads. We extend the research of Anderson et al. (2003) and Boubakri and Ghouma (2010) by differentiating between varying levels of market stress at the time of bond issuance. Our research also has practical implications for family owners and other family firm stakeholders since bond issuance plays an integral part in the fundraising activities of publicly listed firms. The cost of capital can be a decisive factor in corporate

decisions of which projects to pursue and, therefore, may impact the growth potential of the firm (Michiels & Molly, 2017).

References

Altman, E. I., & Rijken, H. A. (2006). A point-in-time perspective on through-the-cycle ratings. *Financial Analysts Journal*, *62*(1), 54–70. https://doi.org/10.2469/faj.v62.n1.4058

Amato, J. D., & Furfine, C. H. (2004). Are credit ratings procyclical? *Journal of Banking and Finance*, *28*(11), 2641–2677. https://doi.org/10.1016/j.jbankfin.2004.06.005

Anderson, R. C., Mansi, S. A., & Reeb, D. M. (2003). Founding family ownership and the agency cost of debt. *Journal of Financial Economics*, *68*(2), 263–285. https://doi.org/10.1016/S0304-405X(03)00067-9

Anderson, R. C., & Reeb, D. M. (2003a). Founding-family ownership and firm performance: Evidence from the S&P 500. *Journal of Finance*, *58*(3), 1301–1327. https://doi.org/10.1111/1540-6261.00567

Anderson, R. C., & Reeb, D. M. (2003b). Founding-family ownership, corporate diversification, and firm leverage. *Journal of Law and Economics*, *46*(2), 653–684. https://doi.org/10.1086/377115

Ashbaugh-Skaife, H., Collins, D.W., & LaFond, R. (2006). The effects of corporate governance on firms' credit ratings. *Journal of Accounting and Economics*, 42(1-2), 203-243. https://doi.org/ 10.1016/j.jacceco.2006.02.003

Berrone, P., Cruz, C., & Gomez-Mejia, L. R. (2012). Socioemotional wealth in family firms. *Family Business Review*, 25(3), 258-279. https://doi.org/ 10.1177/0894486511435355

Bertrand, M., & Schoar, A. (2006). The role of family in family firms. *Journal of Economic Perspectives*, *20*(2), 73–96. https://doi.org/10.1257/jep.20.2.73

Bhojraj, S., Sengupta, P. (2003). Effect of corporate governance on bond ratings and yields: The role of institutional investors and outside directors. *The Journal of Business*, 76(3), 455-476. https://doi.org/10.2139/ssrn.291056

Blume, M. E., Lim, F., & Mackinlay, A. C. (1998). The declining credit quality of U.S. corporate debt: Myth or reality? *Journal of Finance*, *53*(4), 1389–1413. https://doi.org/10.1111/0022-1082.00057

Bonsall, S. B., Holzman, E. R., & Miller, B. P. (2017). Managerial ability and credit risk assessment. *Management Science*, *63*(5), 1425–1449. https://doi.org/10.1287/mnsc.2015.2403j

Boubakri, N., & Ghouma, H. (2010). Control/ownership structure, creditor rights protection, and the cost of debt financing: International evidence. *Journal of Banking and Finance*, *34*(10), 2481–2499. https://doi.org/10.1016/j.jbankfin.2010.04.006

Burkart, M., Panunzi, F., & Shleifer, A. (2003). Family firms. *Journal of Finance*, *58*(5), 2167–2202. https://doi.org/10.1111/1540-6261.00601

Chua, J. H., Chrisman, J. J., Kellermanns, F., Wu, Z. (2011). Family involvement and new venture debt financing. *Journal of Business Venturing*, 26(4), 472–488. https://doi.org/10.1016/j.jbusvent.2009.11.002

Claessens, S., Djankov, S., & Xu, L. C. (2000). East asian corporations. In *World Bank Research Observer: Vol. 15(1)* (Issue February).

Croci, E., Doukas, J. A., & Gonenc, H. (2011). Family control and financing decisions. *European Financial Management*, *17*(5), 860–897. https://doi.org/10.1111/j.1468-036X.2011.00631.x

D'Aurizio, L., Oliviero, T., & Romano, L. (2015). Family firms, soft information and bank lending in a financial crisis. *Journal of Corporate Finance*, *33*(September 2012), 279–292. https://doi.org/10.1016/j.jcorpfin.2015.01.002

Davis, P. S., & Harveston, P. D. (1999). In the founder's shadow: conflict in the family firm. *Family Business Review*, 12 (4), 311-323. https://doi.org/10.1111/j.1741-6248.1999.00311.x.

Dichev, I. D., & Piotroski, J. D. (2001). The long-run stock returns following bond ratings changes. *Journal of Finance*, *56*(1), 173–203. https://doi.org/10.1111/0022-1082.00322

Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *The Academy of Management Review*, 14(1), 57-74. https://doi.org/10.2307/258191

Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of western European corporations. *Corporate Governance and Corporate Finance: A European Perspective*, *65*, 163–190. https://doi.org/10.4324/9780203940136

Gomez-Mejia, L.R., Campbell, J. T., Martin, G., Hoskisson, R. E., Makri, M., & Sirmon, D. G. (2014). Socioemotional wealth as a mixed gamble: Revisiting family firm R&D investments with the Behavioral Agency Model. *Entrepreneurship Theory and Practice*, 38(6), 1351–1374. https://doi.org/10.1111/etap.12083

Gomez-Mejia, L. R., Patel, P. C., Zellweger, T. M. (2018). In the horns of the dilemma: Socioemotional wealth, financial wealth, and acquisitions in family firms. Journal of Management, 44(4), 1369-1397. https://doi.org/10.1177/0149206315614375

Gómez-Mejia, L. R., Chirico, F., Martin, G., & Baù, M. (2022). Best among the worst or worst among the best? Socioemotional Wealth and Risk-Performance Returns for Family and Non-family Firms Under Financial Distress. *Entrepreneurship Theory and Practice*, 0(0). https://doi.org/10.1177/10422587211057420

Graham, J. R., & Harvey, C. R. (2001). The theory and practice of corporate finance: Evidence from the field. *Journal of Financial Economics*, *60*(2–3), 187–243. https://doi.org/10.1016/S0304-405X(01)00044-7

Harper, J., Kemper, K. J., & Sun, L. (2019). Managerial ability and bond rating changes. *Financial Markets, Institutions and Instruments*, *28*(5), 381–401. https://doi.org/10.1111/fmii.12123

Hussinger, K., & Issah, A. B. (2019). Firm acquisitions by family firms: A mixed gamble approach. *Family Business Review*, 32(4), 354–377. https://doi.org/10.1177/0894486519885544

Jensen, M. C., & Meckling, W. (1976). Theory of the firm: managerial behavior, agency costs, and ownership structure, *Journal of Financial Economics*, *3*, 305-360. https://doi.org/10.1016/0304-405X(76)90026-X

Kaplan, R. S., Urwitz, G. (2016). Statistical models of bond ratings : A methodological inquiry. *The Journal of Business, 52*(2), 231–261. *http://www.jstor.org/stable/2352195*

Kellermanns, F. W., Eddleston, K., & Zellweger, T. (2012). Extending the socioemotional wealth perspective: a look at the dark side. *Entrepreneurship: Theory and Practice*, 36 (6), 1175-1182. https://doi.org/10.1111/j.1540-6520.2012.00544.x

Kisgen, D. J. (2006). Credit ratings and capital structure. *Journal of Finance*, *61*(3), 1035–1072. https://doi.org/10.1111/j.1540-6261.2006.00866.x

Kisgen, D. J., & Strahan, P. E. (2010). Do regulations based on credit ratings affect a firm's cost of capital? *Review of Financial Studies*, *23*(12), 4324–4347. https://doi.org/10.1093/rfs/hhq077

Kuang, Y. F., & Qin, B. (2013). Credit ratings and CEO risk-taking incentives. *Contemporary Accounting Research*, *30*(4), 1524–1559. https://doi.org/10.1111/1911-3846.12005

Lin, C., Ma, Y., Malatesta, P., & Xuan, Y. (2011). Ownership structure and the cost of corporate borrowing. *Journal of Financial Economics*, *100*(1), 1–23. https://doi.org/10.1016/j.jfineco.2010.10.012

Lins, K. V., Volpin, P., & Wagner, H. F. (2013). Does family control matter? International evidence from the 2008-2009 financial crisis. *The Review of Financial Studies*, 26(10), 2583–2619. https://doi.org/10.1093/rfs/hht044

Liu, Y., & Jiraporn, P. (2010). The effect of CEO power on bond ratings and yields. *Journal of Empirical Finance*, *17*(4), 744–762. https://doi.org/10.1016/j.jempfin.2010.03.003

Mendez, M., O., J. & Maciel, S., A. (2021). Dark side of the family business: an exploratory perspective. *Journal of Family Business Management*, 11 (4), 386-401. https://doi.org/10.1108/JFBM-07-2020-0065

Michiels, A., & Molly, V. (2017). Financing decisions in family businesses: A review and suggestions for developing the field. *Family Business Review*, *30*(4), 369–399. https://doi.org/10.1177/0894486517736958q

Minichilli, A., Brogi, M. & Calabrò, A. (2015). Weathering the storm: Family ownership, governance, and performance Through the financial and economic crisis. *Corporate Governance An International Review*, 24(6), 552–568. https://doi.org/10.1111/corg.12125

Mishra, C. S., & Mcconaughy, D. L. (1999). Founding family control and capital

structure: The risk of loss of control and the aversion to debt. *Entrepreneurship Theory and Practice*, *23*(4), 53–64. https://doi.org/10.1177/104225879902300404

Myers, S.C. (1977) Determinants of corporate borrowing. *Journal of Financial Economics*, 5, 147-175. https://doi.org/10.1016/0304-405X(77)90015-0

Moody's Investor Services (2008). *Assessing corporate governance in family-controlled companies from a debt holder perspective*. Moody's Special Comment Corporate Governance, New York, NY. https://www.moodys.com/sites/products/AboutMoodysRatingsAttachments/2007000000469566.pdf

Murro, P., & Peruzzi, V. (2019). Family firms and access to credit. Is family ownership beneficial? *Journal of Banking and Finance*, *101*, 173–187. https://doi.org/10.1016/j.jbankfin.2019.02.006

Skousen, C. J., Song, X. (Jason), & Sun, L. (2018). CEO network centrality and bond ratings. *Advances in Accounting*, *40*(December 2017), 42–60. https://doi.org/10.1016/j.adiac.2017.12.003

Stacchini, M., & Degasperi, P. (2015). Trust, family businesses and financial intermediation. *Journal of Corporate Finance*, *33*(June 2013), 293–316. https://doi.org/10.1016/j.jcorpfin.2015.01.006

Schmid, T. (2013). Control considerations, creditor monitoring, and the capital structure of family firms. *Journal of Banking and Finance*, *37*(2), 257–272. https://doi.org/10.1016/j.jbankfin.2012.08.026

Smith, C.W. and Warner, J.B. (1979) On financial contracting: An analysis of bond covenants. *Journal of Financial Economics*, 7, 117-161. https://doi.org/10.1016/0304-405X(79)90011-4

Stein, J. C. (1988) Takeover threats and managerial myopia. *Journal of Political Economy*, 96 (1): 61-80. https://doi.org/10.1086/261524

Villalonga, B., & Amit, R. (2006). How do family ownership, control and management affect firm value? *Journal of Financial Economics*, *80*(2), 385–417. https://doi.org/10.1016/j.jfineco.2004.12.005

Villalonga, B., Amit, R., Trujillo, M. A., & Guzmán, A. (2015). Governance of family firms. *Oxford Review of Economic Policy*, *7*, 635–654. https://doi.org/10.1146/annurev-financial-110613-034357

Villalonga, B., & Amit, R. (2020). Family ownership. *Annual Review of Financial Economics*, 36 (2), 241–257. https://doi.org/10.1093/oxrep/graa007

Table 1

Sample Distribution

This table displays the sample distribution of 5,186 bond issuances of 699 firms during the period 1995 to 2018 with respect to the year of bond issuance and type of bond issued for the full sample, for family-owned and for non-family-owned firms.

	Full Sample		Family Firms		Non-Family Firms	
	N	%	N	%	N	%
Panel A: Bond Issuances by Year (n = 5,186)						
1995-1999	601	11.6%	114	14.0%	487	11.1%
2000-2004	776	15.0%	180	22.0%	596	13.6%
2005-2009	909	17.5%	148	18.1%	761	17.4%
2010-2014	1603	30.9%	226	27.7%	1377	31.5%
2015-2018	1297	25.0%	149	18.2%	1148	26.3%
Total	5,186		817		4,369	
Panel B: Bond Issuances by Type (n = 5,186)						
Call Option	2,333	45.0%	371	45.4%	1,962	44.9%
Investment Grade Issuer	4,041	77.9%	560	68.5%	3,481	79.7%

Table 2

Descriptive and Univariate Statistics

This table displays the descriptive and univariate statistics of bond issue and bond issuer characteristics of 5,186 bond issuances of 699 firms during the period 1995 to 2018 for family owned and non-family-owned firms. The data is winsorized at the 5% level. The spread (in bps), the duration (in years) and the issue size (in USD millions) refer to the characteristics of the bond issuance. The spread is calculated as the difference between the bond yield and the yield of a comparable treasury security. The firm size (in USD millions), the leverage, the performance, the risk and the credit rating refer to the bond issuer. The variables are described in further detail in Appendix 1.

	Entire Sample (n = 5,186)			Family-Owned Firms (n = 817)			Non-Family-Owned Firms (n = 4,369)			Difference of Mean	
	Mean	SD	Median	Mean (1)	SD	Median	Mean (2)	SD	Median	[(1)-(2)]	t-statistic
Panel A: Bond Issue Characteristics (n = 5,186)											
Spread	195.98	139.13	150.00	213.21	146.58	170.00	192.76	137.47	145.00	2.44***	(3.86)
Duration	7.50	3.47	7.11	7.18	3.23	6.80	7.56	3.51	7.19	-0.38***	(-2.84)
Issue Size	581.47	394.80	500.00	511.35	379.69	400.00	594.58	396.23	500.00	-83.23***	(-5.55)
Panel B: Bond Issuer Characteristics (n = 5,186)											
Firm Size	25,607.27	53,885.32	8,879.9	18,464.70	30,665.59	5,556.46	26,943.23	57,094.72	9,557.00	-8,478***	(-4.13)
Leverage	0.48	0.17	0.47	0.47	0.16	0.46	0.48	0.17	0.47	-0.01**	(-2.24)
Perform	0.10	0.05	0.10	0.10	0.05	0.10	0.10	0.05	0.10	0.00	(0.14)
Risk	0.45	0.77	0.17	0.52	0.93	0.17	0.43	0.74	0.18	0.08***	(2.86)
Rating	14.78	3.08	15.00	14.27	3.32	14.00	14.86	3.03	15.00	-0.59***	(-5.00)

Figure 1

Graph of St. Louis Fed Financial Stress Index

This graph shows the St. Louis Fed Financial Stress Index over the period from 1995 to 2018. The Index is based on seven interest rate indicators, six yield spread indicators and five general indicators. The average value of the index since 1993 is set to 0 which is representing a normal financial market condition. While values below 0 represent below-average market stress, values above 0 represent above average market stress.

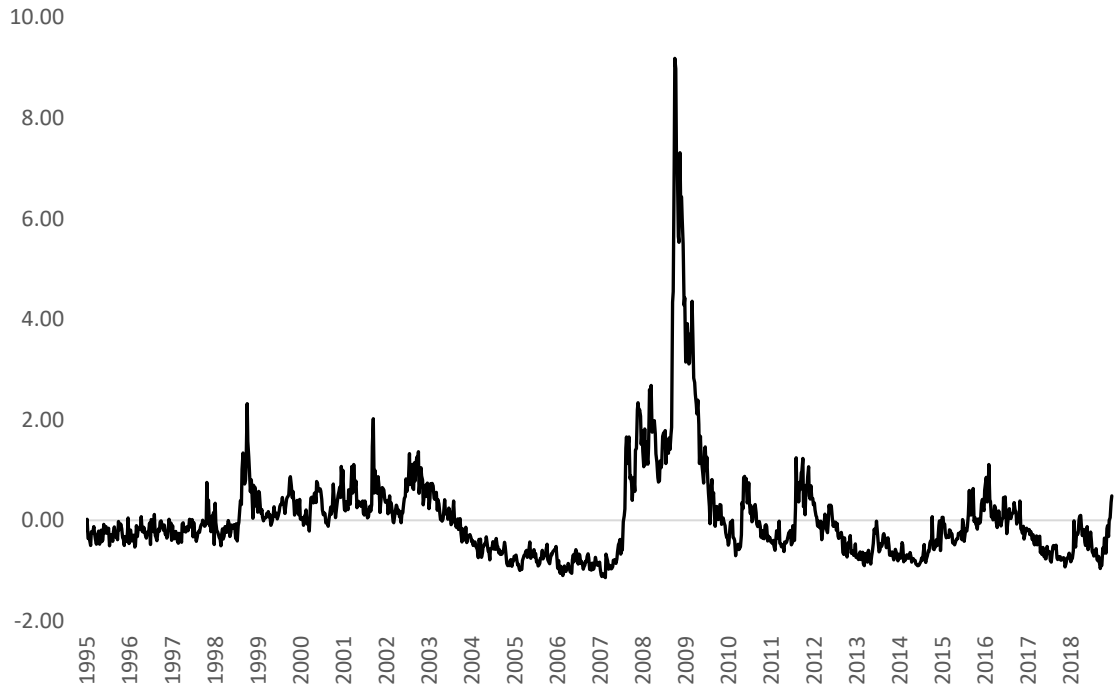


Table 3

Univariate Statistics – Market Stress Subsamples

This table displays the univariate analysis of bond issue and bond issuer characteristics of 5,186 bond issuances of 699 firms for family owned and non-family-owned firms, issued during periods of below average and above average market stress. The variables are winsorized at the 5% level. The spread (in bps), the duration (in years) and the issue size (in USD millions) refer to the characteristics of the bond issuance. The spread is calculated as the difference between the bond yield and the yield of a comparable treasury security. The firm size (in USD millions), the leverage, the performance, risk and credit rating refer to the bond issuer. The variables are described in further detail in Appendix 1.

	Below Average Market Stress (n = 3,272)				Above Average Market Stress (n = 1,914)			
	Family Firm (1) (n=509)	Non-Family Firm (2) (n=2,763)	Difference of Mean [(1)-(2)]	t-statistic	Family Firm (3) (n=308)	Non-Family Firm (4) (n=1,606)	Difference of Mean [(3)-(4)]	t-statistic
Panel A: Bond Issue Characteristics								
Spread	177.20	171.19	6.01	(-0.97)	272.70	229.87	42.83***	(4.69)
Duration	7.55	7.82	-0.27	(-1.56)	6.58	7.10	-0.53***	(-2.73)
Issue Size	526.12	603.69	-77.56***	(-4.07)	486.93	578.92	-91.98***	(-3.78)
Panel B: Bond Issuer Characteristics								
Firm Size	20,431.61	29,083.4	-8,651***	(-3.09)	15,214.18	23,262.57	-8,048***	(-2.84)
Leverage	0.47	0.48	-0.01	(-1.08)	0.47	0.49	-0.02**	(-2.3)
Perform	0.10	0.10	0.00	(0.88)	0.09	0.10	0.00	(-0.87)
Risk	0.49	0.44	0.04	(1.21)	0.56	0.42	0.15***	(3.24)
Rating	14.24	14.71	-0.38***	(-2.49)	14.17	15.11	-0.95***	(-5.12)

Table 4

Impact of Family Ownership on Bond Spreads – Main Analysis

This table presents the cross-sectional regression results of the effect of founding family ownership on bond spreads. The sample comprises 5,186 bond issuances of 699 firms in the S&P 1500 during the period from 1995 to 2018. Our dependent variable is the bond spread, which is the difference between the bond yield and the yield of a comparable treasury security. The T-statistics are based on robust standard errors which are clustered by firm and are reported in parenthesis. Variables are winsorized at the 5% level. *,**, and *** indicates statistical significance at the 10%, 5% and 1% levels, respectively. The variables are described in detail in Appendix 1.

	Total Sample Period	Total Sample Period	Below Average Market Stress Subsample	Above Average Market Stress Subsample	Non-Crisis Years Subsample	Crisis Years Subsample
	(1)	(2)	(3)	(4)	(5)	(6)
FamFirm	-5.98	-5.62	-11.59***	1.57	-13.31***	18.27*
	(-1.48)	(-1.41)	(-3.15)	(0.22)	(-3.44)	(1.86)
FinStress_Dummy		41.46***				
		(12.07)				
Duration	2.25***	2.37***	3.30***	0.52	3.08***	-2.63**
	(7.63)	(8.17)	(12.13)	(0.83)	(11.36)	(-2.43)
Issue Size	8.34***	8.11***	9.08***	6.91	8.59***	5.43
	(3.23)	(3.18)	(3.43)	(1.46)	(3.39)	(0.76)
Firm Size	-8.28***	-8.35***	-10.81***	-5.66	-8.97***	-5.26
	(-3.98)	(-4.06)	(-5.75)	(-1.62)	(-4.56)	(-0.98)
Leverage	-6.82	-9.34	2.81	-26.75	-2.23	-9.04
	(-0.69)	(-0.93)	(0.31)	(-1.44)	(-0.25)	(-0.34)
Perform	-203.12***	-204.21***	-157.28***	-274.88***	-199.77***	-225.68**
	(-5.21)	(-5.29)	(-4.41)	(-4.12)	(-5.66)	(-2.06)
Risk	3.29*	3.39*	4.15**	1.07	4.14**	-0.99
	(1.82)	(1.93)	(2.35)	(0.30)	(2.29)	(-0.18)
Call	29.19***	28.99***	22.35***	42.73***	27.84***	51.57***
	(7.58)	(7.65)	(5.63)	(5.87)	(7.08)	(4.17)
Intercept	469.31***	457.54***	532.85***	341.14***	586.69***	462.21***
	(7.27)	(6.95)	(33.64)	(8.89)	(31.13)	(8.50)
Credit Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	5,186	5,186	3,272	1,914	4,092	1,094
# of firms	699	699	614	493	675	368
R-squared	0.77	0.78	0.83	0.72	0.81	0.64

Table 5

Impact of Family Heterogeneity on Bond Spreads – Family Firm Subsample

This table shows the cross-sectional regression results of the effect of family heterogeneity on bond spreads at issuance for the subsample of family-owned firms. The subsample comprises 817 bond issuances of 151 firms in the S&P 1500 during the period from 1995 to 2018. The dependent variable is the bond spread, which is the difference between the bond yield and the yield of a comparable treasury security. The T-statistics are based on robust standard errors, which are clustered by firm and are reported in parenthesis. The variables are winsorized at the 5% level. The statistical significance at the 10%, 5% and 1% levels is indicated as *,**, and ***, respectively. The variables are described in detail in Appendix 1.

	Total Sample Period					Below Average Market Stress Subsample					Above Average Market Stress Subsample				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Fam_Stake	0.38					0.57**					0.20				
	(1.16)					(2.10)					(0.34)				
CeoFounder		-17.44**					6.33					-39.26**			
		(-2.61)					(0.88)					(-2.43)			
CeoDescendent			4.11					-11.04					25.06		
			(0.49)					(-1.24)					(1.49)		
CeoDescendent/FounderChairman				22.85					-6.10					36.31	
				(0.94)					(-0.21)					(1.42)	
CeoHire					9.34					3.06					3.76
					(1.34)					(0.45)					(0.28)
FinStress_Dummy	37.06***	36.55***	36.70***	36.74***	36.85***										
	(5.39)	(5.32)	(5.35)	(5.36)	(5.33)										
Intercept	37.06***	630.15***	615.67***	615.50***	612.96***	540.14***	550.49***	553.28***	550.67***	547.91***	585.36***	648.41***	594.61***	599.30***	598.03***
	(5.39)	(16.65)	(16.04)	(16.05)	(15.91)	(15.38)	(15.92)	(15.88)	(15.85)	(15.56)	(6.09)	(7.63)	(6.92)	(6.83)	(6.91)
Credit Rating FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	817	817	817	817	817	509	509	509	509	509	308	308	308	308	308
Number of firms	151	151	151	151	151	122	122	122	122	122	113	113	113	113	113
R-squared	0.83	0.83	0.83	0.83	0.82	0.87	0.87	0.87	0.87	0.87	0.80	0.81	0.80	0.80	0.80

Table 6

Impact of Family Ownership on Likelihood of Bond Issuance After Rating Downgrade/Upgrade

This table displays the cross-sectional regressions of the effect of founding family ownership on the likelihood of bond issuance after a rating downgrade (Panel A) or rating upgrade (Panel B). The sample comprises 5,186 bond issuances of 699 firms in the S&P 1500 during the period from 1995 to 2018. The dependent variable is a dummy variable that takes the value of 1 if there was a rating downgrade (or upgrade respectively) between the bond issuance and the end of the preceding financial year t-1. The table shows the regression coefficients with t-statistics and the corresponding odds ratio in parenthesis. The T-statistics are based on robust standard errors clustered by firm. The data is winsorized at the 5% level. The statistical significance at 10%, 5% and 1% is shown as *,**, and ***, respectively. The variables are described in detail in Appendix 1.

Panel A: Bond Issuance after Rating Downgrade

	Total Sample Period		Below Average Market Stress Subsample		Above Average Market Stress Subsample		Non-Crisis Years Subsample		Crisis Years Subsample	
	(1)		(2)		(3)		(4)		(5)	
	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio
FamFirm	0.32	1.38	0.16	1.18	0.57*	1.77*	0.10	1.10	0.92***	2.51***
	(1.29)		(0.45)		(1.81)		(0.26)		(2.75)	
Control Variables	Yes		Yes		Yes		Yes		Yes	
Credit Rating FE	Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes	
# observations	5,004		3,100		1,812		3,813		1,055	
# firms	688		595		479		656		362	

Panel B: Bond Issuance after Rating Upgrade

	Total Sample Period		Below Average Market Stress Subsample		Above Average Market Stress Subsample		Non-Crisis Years Subsample		Crisis Years Subsample	
	(1)		(2)		(3)		(4)		(5)	
	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio
FamFirm	0.16	1.17	0.06	1.06	0.31	1.36	0.15	1.16	0.18	1.20
	(0.99)		(0.31)		(1.31)		(0.82)		(0.53)	
Control Variables	Yes		Yes		Yes		Yes		Yes	
Credit Rating FE	Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes	
# observations	5,011		3,042		1,779		3,839		920	
# firms	689		597		485		660		336	

Table 7

Impact of Family Ownership on Bond Spreads with Rating Downgrade/Upgrade Control

This table details the cross-sectional regression results of the effect of founding family ownership on bond spreads. The sample comprises 5,186 bond issuances of 699 firms in the S&P 1500 during the period from 1995 to 2018. The dependent variable is the bond spread which is the difference between the bond yield and the yield of a comparable treasury security. We control for rating downgrades and rating upgrades in the control variables. The rating downgrade and upgrade dummy variables take the value of 1 if there was a rating downgrade or upgrade, respectively, between the bond issuance and the end of the preceding financial year t-1. T-statistics based on robust standard errors clustered by firm are reported in parenthesis. Variables are winsorized at the 5% level. Statistical significance at the 10%, 5% and 1% levels indicated as *,**, and ***, respectively. The variables are described in detail in Appendix 1.

	Total Sample Period	Total Sample Period	Below Average Market Stress Subsample	Above Average Market Stress Subsample	Non-Crisis Years Subsample	Crisis Years Subsample
	(1)	(2)	(3)	(4)	(5)	(6)
FamFirm	-6.51	-6.14	-11.73***	0.62	-13.45***	14.94
	(-1.63)	(-1.55)	(-3.16)	(0.09)	(-3.45)	(1.58)
FinStress_Dummy		41.11***				
		(11.94)				
Duration	2.31***	2.43***	3.34***	0.68	3.13***	-2.48**
	(7.88)	(8.41)	(12.30)	(1.11)	(11.54)	(-2.29)
Issue Size	7.14***	6.97***	7.98***	6.11	7.50***	4.34
	(2.76)	(2.73)	(2.95)	(1.34)	(2.92)	(0.64)
Firm Size	-8.30***	-8.36***	-10.41***	-6.50*	-8.84***	-5.35
	(-4.01)	(-4.06)	(-5.48)	(-1.92)	(-4.42)	(-1.03)
Leverage	-6.51	-8.98	5.37	-31.37*	-0.23	-18.04
	(-0.66)	(-0.89)	(0.60)	(-1.70)	(-0.03)	(-0.71)
Perform	-206.87***	-207.81***	-162.62***	-271.16***	-205.00***	-223.94**
	(-5.35)	(-5.43)	(-4.58)	(-4.07)	(-5.84)	(-2.12)
Risk	3.28*	3.37*	3.87**	1.74	3.96**	1.31
	(1.84)	(1.94)	(2.19)	(0.50)	(2.21)	(0.26)
Call	29.14***	28.94***	22.38***	42.62***	27.82***	54.33***
	(7.58)	(7.66)	(5.67)	(5.89)	(7.10)	(4.45)
RatingDowngrade	19.34***	18.38***	12.29**	25.10***	15.52***	33.72***
	(3.84)	(3.68)	(2.47)	(3.11)	(3.09)	(3.03)
RatingUpgrade	-0.03	0.21	9.43**	-16.98**	5.12	-25.85**
	(-0.01)	(0.05)	(2.04)	(-2.28)	(1.27)	(-2.19)
Intercept	470.09***	458.16***	528.98***	338.48***	591.28***	441.99***
	(6.50)	(6.25)	(30.51)	(8.86)	(30.23)	(8.21)
Credit Rating FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	5,186	5,186	3,272	1,914	4,092	1,094
# of firms	699	699	614	493	675	368
R-squared	0.78	0.79	0.84	0.72	0.82	0.64

Table 8

Distribution of Rating Changes

This table presents the distribution of rating changes (upgrade, no change, downgrade) for all firms, family-owned firms and non-family-owned firms for the panel dataset of the 699 bond issuers. The table displays the distribution of rating changes for the full period from 1995 to 2018 (10,089 firm-year observations) and the subperiods for years of market stress and years of financial crisis. The variables upgrade, stable and downgrade are dummy variables with the value of 1 if the company's long term-credit rating at the end of the financial year j has been upgraded, stable or downgraded compared to the end of financial year j-1.

	All Firms		Family-Owned Firms		Non-Family-Owned Firms		
	#	%	#	% (1)	#	% (2)	% Difference [(1)-(2)]
Panel A: Full Period							
Upgrade	1107	10.97	203	10.99	904	10.97	0.0
No Change	7,779	77.1	1399	75.74	6,380	77.41	-1.7
Downgrade	1203	11.92	245	13.26	958	11.62	1.6
Firm-Year Observations	*10,089*		*1,847*		*8,242*		
Panel B: Below-Average Market Stress							
Upgrade	645	12.46	119	13.92	526	12.18	1.7
No Change	4,076	78.76	661	77.31	3,415	79.05	-1.7
Downgrade	454	8.77	75	8.77	379	8.77	0.0
Firm-Year Observations	*5,175*		*855*		*4,320*		
Panel C: Above-Average Market Stress							
Upgrade	462	9.4	84	8.47	378	9.64	-1.2
No Change	3,703	75.36	738	74.4	2,965	75.6	-1.2
Downgrade	749	15.24	170	17.14	579	14.76	2.4
Firm-Year Observations	*4,914*		*992*		*3,922*		
Panel B: Non-Crisis							
Upgrade	872	11.88	163	12.82	709	11.68	1.1
No Change	5,741	78.19	984	77.42	4,757	78.36	-0.9
Downgrade	729	9.93	124	9.76	605	9.97	-0.2
Firm-Year Observations	*7,342*		*1,271*		*6,071*		
Panel C: Crisis							
Upgrade	235	9	40	6.94	195	8.98	-2.0
No Change	2,038	74	415	72.05	1,623	75	-2.7
Downgrade	474	17.26	121	21.01	353	16	4.8
Firm-Year Observations	*2,747*		*576*		*2,171*		

Table 9

Impact of Family Ownership on Likelihood of Rating Downgrade/ Upgrade For Bond Issuers

This table presents the panel data logit regression results of the effect of founding family ownership on the likelihood of a rating downgrade (Panel A) or rating upgrade (Panel B) during periods of below average and above-average market stress. The sample comprises 10,089 firm-year observations of the 699 bond issuers during the period from 1995 to 2018. The dependent variable is a dummy variable that takes the value of 1 if the company's long-term S&P credit rating at the end of the financial year t has been downgraded (or upgraded respectively) compared to the end of financial year t-1. The table shows the regression coefficients with t-statistics in parenthesis and odds ratio. Variables are winsorized at the 5% level. Statistical significance at the 10%, 5% and 1% levels displayed as *,**, and ***. The variables are described in Appendix 1.

Panel A: Rating Downgrade

	Total Sample Period		Below Average Market Stress Subsample		Above Average Market Stress Subsample		Non-Crisis Years Subsample		Crisis Years Subsample	
	(1)		(2)		(3)		(2)		(3)	
	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio
FamFirm	0.35***	1.41***	0.12	1.12	0.40***	1.50***	0.18	1.18	0.58***	1.79***
	(3.13)		(0.66)		(3.25)		(1.19)		(3.79)	
Control Variables	Yes		Yes		Yes		Yes		Yes	
Credit Rating FE	Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes	
Number of observations	9,958		5,081		4,844		7,237		2,707	
Number of firms	689		674		666		685		562	

Panel B: Rating Upgrade

	Total Sample Period		Below Average Market Stress Subsample		Above Average Market Stress Subsample		Non-Crisis Years Subsample		Crisis Years Subsample	
	(1)		(2)		(3)		(2)		(3)	
	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio	Coef.	Odds Ratio
FamFirm	-0.09	0.91	0.03	1.03	-0.20	0.82	-0.00	1.00	-0.37*	0.69*
	(-0.94)		(0.23)		(-1.40)		(-0.02)		(-1.79)	
Control Variables	Yes		Yes		Yes		Yes		Yes	
Credit Rating FE	Yes		Yes		Yes		Yes		Yes	
Year FE	Yes		Yes		Yes		Yes		Yes	
Industry FE	Yes		Yes		Yes		Yes		Yes	
Number of observations	9,989		5,078		4,838		7,274		2,676	
Number of firms	687		673		660		684		555	

Appendix 1

Description of Variables

The table displays the definition of the variables used in the analyses.

Variable	Description
Spread	Yield to maturity of a corporate bond at bond issuance minus the yield to maturity of a comparable US treasury bond
FamFirm	Dummy variable that has the value of 1 if the founding family (including descendants) owns more than 5% of the firm's equity, 0 otherwise
FamStake	Aggregate percentage of beneficial ownership of the founding family in the family-owned firm
CEOFounder	Dummy variable with value of 1 if the founder is the CEO of the family firm
CEODescendent	Dummy variable with value of 1 if a descendent of the founder is the CEO of the family firm
CEODesc_FounderChairman	Dummy variable with value of 1 if a descendent of the founder is the CEO and the founder is the chairman of the board of the family firm
CEOHire	Dummy variable with value of 1 if an external professional is the CEO of the family firm
Crisis	Dummy variable with value of 1 if the bond was issued during 2001-2004 [Dotcom] or 2007-2009 [GFC]
FinStress_Dummy	Dummy variable with value of 1 if the St. Louis Fed Financial Stress Index was above 0
VIX	Dummy variable with value of 1 if the VIX was above its historical average over the sample period three months prior to bond issuance
Duration	Macaulay duration of the bond at bond issuance
Credit Rating	S&P long-term corporate credit rating which has been transformed to a numerical scale from 1 to 22 (Appendix 2).
Firm Size	Natural log of the sum of debt and equity of the firm (in USD millions)
Leverage	Ratio of total debt to total capital
Perform	Ratio of cashflow (net income+depreciation+amortization) to total assets
Risk	Standard deviation of cashflows scaled by long-term debt over the preceding 5 years
Call	Dummy variable with value of 1 if the bond has a call option
Issue Size	Natural log of the bond amount at bond issuance (in USD millions)
Downgrade	Dummy variable with value of 1 if the credit rating at issuance is worse than at year j-1
RatingDowngrade	Dummy variable with value of 1 if the company's long-term S&P credit rating at the end of the financial year j has been downgraded compared to the end of financial year j-1
Upgrade	Dummy variable with value of 1 if the credit rating at issuance is better than at year j-1
RatingUpgrade	Dummy variable with value of 1 if the company's long-term S&P credit rating at the end of the financial year j has been upgraded compared to the end of financial year j-1

Appendix 2

Credit Rating Numerical Conversions

This table displays the numerical conversion codes for the S&P credit ratings.

Conversion Number	S&P Rating
22	AAA
21	AA+
20	AA
19	AA-
18	A+
17	A
16	A-
15	BBB+
14	BBB
13	BBB-
12	BB+
11	BB
10	BB-
9	B+
8	B
7	B-
6	CCC+
5	CCC
4	CCC-
3	CC
2	C
1	D

Appendix 3

Distribution of Bond Issuances Sample by Industry

This table displays the sample distribution of 5,186 bond issuances of 699 firms during the period 1995 to 2018 with respect to the industry distribution of the bond issuer for the full sample, for family-owned firms and for non-family-owned firms.

		Full Sample		Family Firms		Non-Family Firms	
SIC Code	Industry Type	N	%	N	%	N	%
0	Agriculture	2	0.04	2	0.23	0	0.00
1	Mining	665	12.82	148	17.37	517	11.35
2	Construction	1,392	26.84	164	19.25	1,228	26.95
3	Manufacturing	1,369	26.40	149	17.49	1,220	26.77
4	Transportation	369	7.12	97	11.38	272	5.97
5	Wholesale Trade	728	14.04	127	14.91	601	13.19
7	Retail Trade	476	9.18	118	13.85	358	7.86
8	Services	119	2.29	12	1.41	107	2.35
9	Public Administration	66	1.27	0	0.00	66	1.45
	Total	*5,186*		*852*		*4,557*	

Appendix 4

Detailed Descriptive Statistics - Entire Sample

This table displays the descriptive statistics of the bond issue characteristics and bond issuer characteristics of 5,186 bond issuances of 699 firms during the period 1995 to 2018. The variables are winsorized at the 5% level. The spread (in bps), the duration (in years) and the issue size (in USD millions) refer to the characteristics of the bond issuance. The spread is calculated as the difference between the bond yield and the yield of a comparable treasury security. The firm size (in USD millions), the leverage, the performance, risk and credit rating refer to the bond issuer. The variables are described in detail in Appendix 1.

	Mean	SD	Median	P25	P75	Min	Max
Panel A: Bond Issue Characteristics							
Spread	195.98	139.13	150.00	90.00	262.00	48.00	545.00
Duration	7.50	3.47	7.11	4.82	8.37	2.74	16.41
Issue Size	581.47	394.80	500.00	300.00	750.00	9.5	1,500
Panel B: Bond Issuer Characteristics							
Firm Size	25,607.27	53,885.32	8,879.9	3,362.53	22,561.00	617.88	479,788
Leverage	0.48	0.17	0.47	0.36	0.60	0.20	0.82
Perform	0.10	0.05	0.10	0.06	0.13	-0.01	0.19
Risk	0.45	0.77	0.17	0.09	0.40	0.02	3.65
Credit Rating	14.78	3.08	15.00	13.00	17.00	9.00	21.00

Appendix 5

Descriptive Overview of Bond Spreads per Rating Category

This table presents the mean bond spread at issuance per credit rating category for the full sample, family firms and non-family firms.

	Full Sample			Non-Family Firms			Family Firms		
Credit Rating	Spread	# of bond issues	% of bond issues	Spread	# of bond issues	% of bond issues	Spread	# of bond issues	% of bond issues
AAA	85.2	125	2.4	61.8	13	1.6	87.9	112	2.6
AA+	96.6	82	1.6	N/A	0	0.0	96.6	82	1.9
AA	83.8	167	3.2	73.2	54	6.6	88.8	113	2.6
AA-	90.1	239	4.6	129.6	44	5.4	81.2	195	4.5
A+	104.6	350	6.7	107.9	59	7.2	103.9	291	6.7
A	115.1	632	12.2	117.5	71	8.7	114.7	561	12.8
A-	126.2	468	9.0	109.2	46	5.6	128.0	422	9.7
BBB+	154.5	647	12.5	167.9	46	5.6	153.4	601	13.8
BBB	174.4	837	16.1	170.5	131	16.0	175.1	706	16.2
BBB-	220.3	494	9.5	211.4	96	11.8	222.4	398	9.1
BB+	304.8	266	5.1	290.6	53	6.5	308.3	213	4.9
BB	382.9	313	6.0	344.6	83	10.2	396.7	230	5.3
BB-	409.7	241	4.6	389.4	56	6.9	415.9	185	4.2
B+	495.5	170	3.3	487.8	44	5.4	498.2	126	2.9
B	534.2	116	2.2	568.3	18	2.2	527.9	98	2.2
B-	561.9	28	0.5	639.0	2	0.2	556.0	26	0.6
CCC+	726.6	9	0.2	N/A	0	0.0	726.6	9	0.2
CCC	636.8	2	0.0	711	1	0.1	562.6	1	0.0
CCC-	N/A	0	0.0	N/A	0	0.0	N/A	0	0.0
CC	N/A	0	0.0	N/A	0	0.0	N/A	0	0.0
C	N/A	0	0.0	N/A	0	0.0	N/A	0	0.0
D	N/A	0	0.0	N/A	0	0.0	N/A	0	0.0
Total		*5,186*			*4,369*			*817*	

Appendix 6

Univariate Analysis per Credit Rating Category – Non-Crisis and Crisis Period

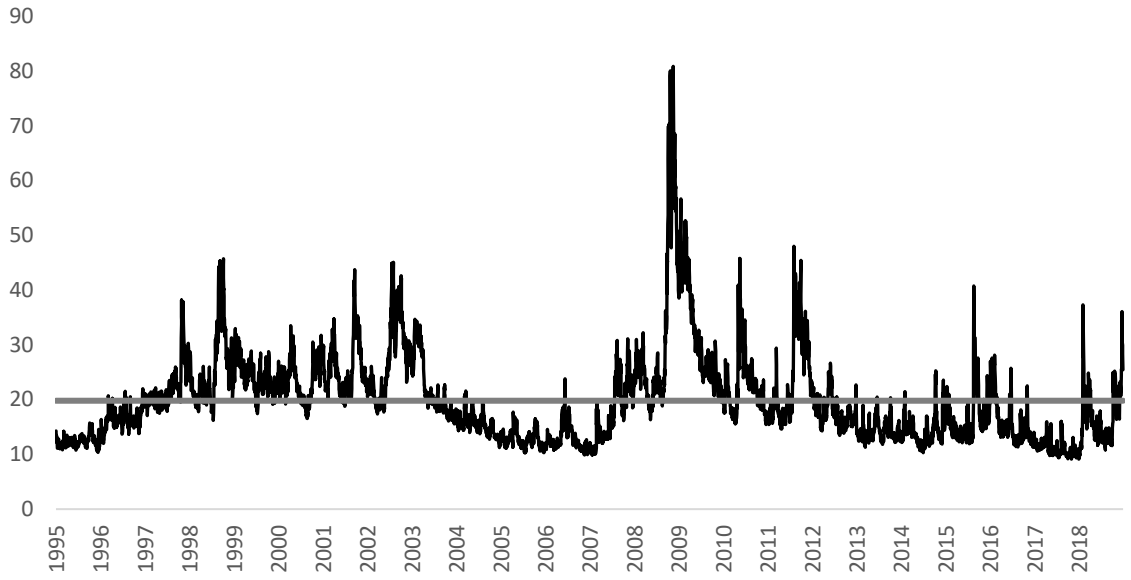
This table presents the mean bond spread at issuance per credit rating category for the full sample, family firms and non-family firms during the non-crisis and crisis period.

	Bond Spreads during Non-Crisis Period				Bond Spreads during Crisis Period			
	Family	Non-Family	Difference	T-Statistic	Family	Non-Family	Difference	T-Statistic
AAA	49.8	63.2	-13.4	(-1.2)	101.7	124.6	-22.9	(-0.5)
AA+	NA	90.1	N/A	N/A	NA	118.0	NA	N/A
AA	61.0	67.9	-6.9	(-1.2)	95.7	120.4	-24.7	(-1.2)
AA-	100.8	59.5	41.3***	(6.8)	191.4	109.9	81.5***	(3.6)
A+	78.2	77.8	0.5	(0.08)	170.5	133.7	36.8*	(1.8)
A	87.4	83.6	3.8	(0.56)	150.3	161.3	-11.0	(-0.6)
A-	86.8	102.7	-15.9**	(-2.5)	151.2	171.2	-20.0	(-1.1)
BBB+	120.6	125.1	-4.5	(-0.5)	248.6	205.4	43.3	(1.4)
BBB	139.2	142.9	-3.7	(-0.6)	219.6	235.2	-15.7	(0.8)
BBB-	145.1	185.0	-39.9***	(-4.1)	321.9	272.5	49.4	(2.0)
BB+	249.4	279.9	-30.6	(-1.4)	364.4	368.9	-4.6	(-0.2)
BB	280.3	348.8	-68.4***	(-3.6)	420.8	488.2	-67.5	(-1.9)
BB-	322.7	376.0	-53.3***	(-2.6)	542.3	520.7	21.7	(0.4)
B+	437.0	452.0	-15.0	(-0.5)	543.4	618.4	-75.0	(-1.5)
B	545.5	489.8	55.7	(1.4)	648.3	639.2	9.0	(-0.1)
B-	639.0	504.7	134.3	(1.5)	NA	727.0	NA	N/A
CCC+	NA	665.7	N/A	N/A	NA	848.3	NA	N/A
CCC	711.0	NA	N/A	N/A	NA	562.6	NA	N/A
CCC-	NA	NA	N/A	N/A	NA	NA	NA	N/A
CC	NA	NA	N/A	N/A	NA	NA	NA	N/A
C	NA	NA	N/A	N/A	NA	NA	NA	N/A
D	NA	NA	N/A	N/A	NA	NA	NA	N/A

Appendix 7

Graph of VIX Index

This graph shows the Cboe Volatility Index over the period from 1995 to 2019. The VIX represents the market's expectation of the near-term volatility of the S&P 500 index.



Appendix 8

Impact of Family Ownership on Bond Spreads – Robustness - VIX Subsample

This table shows the cross-sectional regression results of the effect of founding family ownership on bond spreads. The sample comprises 5,186 bond issuances of 699 firms in the S&P 1500 during the period from 1995 to 2018. The dependent variable is the bond spread which is the difference between the bond yield and the yield of a comparable treasury security. T-statistics based on robust standard errors clustered by firm are reported in parenthesis. Variables are winsorized at the 5% level. Statistical significance at the 10%, 5% and 1% levels displayed as *,**, and ***, respectively. The variables are described in detail in Appendix 1.

	Low VIX Subsample	High VIX Subsample
	(1)	(2)
FamFirm	-12.79***	2.29
	(-3.00)	(0.38)
Duration	3.79***	-0.18
	(14.72)	(-0.28)
Issue Size	10.10***	7.24*
	(3.75)	(1.70)
Firm Size	-10.24***	-8.11**
	(-5.77)	(-2.39)
Leverage	0.57	-15.35
	(0.06)	(-0.93)
Perform	-162.93***	-236.37***
	(-3.98)	(-3.92)
Risk	6.58***	-1.98
	(3.08)	(-0.71)
Call	17.42***	45.45***
	(4.95)	(6.04)
Intercept	535.95***	405.70***
	(32.88)	(10.38)
Control Variables	Yes	Yes
Credit Rating FE	Yes	Yes
Year FE	Yes	Yes
Industry FE	Yes	Yes
Number of observations	2,867	2,319
Number of firms	575	535
R-squared	0.84	0.73

Appendix 9

Impact of Family Ownership on Bond Spreads – Robustness – Interaction Effects

This table entails the cross-sectional regression results of the effect of founding family ownership on bond spreads. The sample comprises 5,186 bond issuances of 699 firms in the S&P 1500 during the period from 1995 to 2018. The dependent variable is the bond spread calculated as the difference between the bond yield and the yield of a comparable treasury security. T-statistics based on robust standard errors clustered by firm are reported in parenthesis. Variables are winsorized at the 5% level. Statistical significance at the 10%, 5% and 1% levels indicated as *,**, and ***, respectively. The variables are described in detail in Appendix 1.

	(1)	(2)	(3)
FamFirm	-9.95**	-11.83***	-11.26**
	(-2.37)	(-2.94)	(-2.21)
FinStress Index	39.77***		
	(10.73)		
FamFirm X FinStress Index	11.58		
	(1.44)		
Crisis		195.66***	
		(18.35)	
FamFirm X Crisis		26.04**	
		(2.37)	
VIX			27.38***
			(8.70)
FamFirm X VIX			12.25
			(1.52)
Control Variables	Yes	Yes	Yes
Credit Rating FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Number of observations	5,186	5,186	5,186
Number of firms	699	699	699
R-squared	0.78	0.78	0.78

Appendix 10

Univariate Statistics – Robustness - Propensity Score Matched Sample

This table presents the differences in bond spreads of family-owned firms and non-family-owned firms of a propensity score matched sample for the entire sample period, market stress subsamples and crisis years subsamples. The propensity score matching criteria are based on the following control variables duration, issue size, firm size, leverage, perform, risk, call, credit rating and industry.

Panel A: Entire Sample Period

	Entire Sample Period			
	Family	Non-Family	Difference	t-statistic
Spread	213.16	219.75	-6.6	(-0.90)

Panel B: Market Stress Subsamples

	Below Average Market Stress				Above Average Market Stress			
	Family	Non-Family	Difference	t-statistic	Family	Non-Family	Difference	t-statistic
Spread	176.48	200.19	-23.72***	(-2.81)	272.96	253.46	19.50	(-1.53)

Panel C: Crisis Years Subsamples

	Non-Crisis Years Period				Crisis Years Period			
	Family	Non-Family	Difference	t-statistic	Family	Non-Family	Difference	t-statistic
Spread	185.38	210.75	-25.37***	(-3.24)	305.81	276.67	29.14*	(1.83)

Appendix 11

Impact of Family Ownership on Bond Spreads – Main Analysis – Robustness - PSM Sample

This table presents the cross-sectional regression results of the effect of founding family ownership on bond spreads. The sample comprises the propensity score matched sample of 1,630 bond issuances in the S&P 1500 during the period from 1995 to 2018. The dependent variable is the bond spread calculated as the difference between the bond yield and the yield of a comparable treasury security. Variables are winsorized at the 5% level. Statistical significance at the 10%, 5% and 1% levels shown as *,**, and ***, respectively. The variables are described in detail in Appendix 1.

	Total Sample Period	Below Average Market Stress Subsample	Above Average Market Stress Subsample	Non-Crisis Years Subsample	Crisis Years Subsample
	(1)	(2)	(3)	(4)	(5)
FamFirm	-4.80	-13.06***	7.86	-11.78***	18.52*
	(-1.40)	(-3.69)	(1.17)	(-3.46)	(1.87)
Duration	1.70***	2.71***	-0.01	2.66***	-1.85
	(2.81)	(4.56)	(-0.01)	(4.67)	(-0.85)
Issue Size	3.30	9.22**	-5.21	4.45	-5.21
	(0.81)	(2.10)	(-0.70)	(1.09)	(-0.47)
Firm Size	-9.99***	-11.86***	-8.09*	-13.09***	3.32
	(-3.98)	(-4.41)	(-1.72)	(-5.22)	(0.46)
Leverage	-5.33	9.11	-14.56	4.37	6.76
	(-0.46)	(0.74)	(-0.67)	(0.37)	(0.21)
Perform	-258.03***	-153.33***	-383.93***	-215.36***	-261.40**
	(-6.35)	(-3.49)	(-5.17)	(-5.13)	(-2.44)
Risk	1.60	4.34*	-3.58	3.42	-1.51
	(0.67)	(1.75)	(-0.77)	(1.48)	(-0.21)
Call	25.84***	17.77***	50.56***	23.69***	62.11***
	(5.23)	(3.62)	(4.72)	(5.07)	(3.35)
Intercept	464.96***	534.37***	446.19***	572.50***	429.59***
	(8.67)	(8.79)	(3.74)	(8.94)	(4.02)
Control Variables	Yes	Yes	Yes	Yes	Yes
Credit Rating FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
# Observations	1,630	1,037	593	1,269	361
R-squared	0.80	0.85	0.77	0.82	0.71

Appendix 12

Impact of Family Ownership on Issue Size and Bond Duration

This table presents the cross-sectional regression results of the effect of founding family ownership on bond issue size and bond duration. The sample comprises 5,186 bond issuances of 699 firms in the S&P 1500 during the period from 1995 to 2018. The dependent variables are the bond issue amount (in log form) and the bond duration. T-statistics based on robust standard errors clustered by firm are reported in parenthesis. Variables are winsorized at the 5% level. Statistical significance at the 10%, 5% and 1% levels indicated as *,**, and ***, respectively. The variables are described in detail in Appendix 1.

Panel A: Dependent Variable Issue Size

	Total Sample Period	Total Sample Period	Below Average Market Stress Subsample	Above Average Market Stress Subsample
	(1)	(2)	(3)	(4)
FamFirm	0.13**	0.13**	0.07	0.20**
	(1.97)	(1.97)	(1.04)	(2.38)
FinStress_Dummy		-0.04		
		(-0.66)		
Intercept	3.03***	3.04***	-0.78**	1.51*
	(4.57)	(4.53)	(-2.51)	(1.92)
Control Variables	Yes	Yes	Yes	Yes
Credit Rating FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
# of observations	7,930	7,930	5,035	2,895
R-squared	0.58	0.58	0.65	0.48

Panel B: Dependent Variable Duration

	Total Sample Period	Total Sample Period	Below Average Market Stress Subsample	Above Average Market Stress Subsample
	(1)	(2)	(3)	(4)
FamFirm	-0.09	-0.10	-0.07	-0.12
	(-0.52)	(-0.53)	(-0.30)	(-0.61)
FinStress_Dummy		-0.24**		
		(-1.98)		
Intercept	5.61***	5.70***	4.56***	5.52***
	(7.09)	(7.24)	(4.75)	(3.07)
Control Variables	Yes	Yes	Yes	Yes
Credit Rating FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
# of observations	7,808	7,808	4,982	2,826
R-squared	0.09	0.09	0.09	0.10