

Financial Distress of Family-Owned Firms

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Abstract

We study family ownership under financial distress. Our analyses cover 13,127 firm-year observations of 728 publicly listed S&P 500 firms, consisting of 185 family-owned and 543 non-family-owned firms, from 1995 to 2019. Firstly, our paper shows that publicly listed family-owned firms are less likely to be in financial distress in the first place. Secondly, our results show that for firms in distress, family-owned firms are associated with a more conservative liquidity position and capitalization. Family-owned firms in financial distress have significantly higher cash reserves, a higher equity capitalization, higher stock issuance, and higher cashflows from investing activities compared to non-family-owned firms. Our findings are in line with the Socioemotional Wealth (SEW) theory of family owners protecting their socioemotional wealth, which could be threatened by payment defaults to creditors and the associated risk of chapter 11 bankruptcy.

Keywords: family firms, financial distress

JEL Codes: G30, G32

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1 Introduction

All firms are exposed to the risks of organization decline and distress due to both external macro-economic factors and internal firm specific challenges (Trahms et al., 2013). Yet, for family-owners, firm distress not only threatens the economic wealth of their equity stake but also their socioemotional wealth (Berrone et al., 2012). Socioemotional wealth encompasses the various non-economic benefits of family ownership, which are related amongst others to the emotional gains of being a member of the founding family, their role in the company's management or board and their reputation in society associated with their family legacy (Berrone et al., 2012; Gomez-Mejia et al., 2011). In times of financial distress, a firm's management team is forced to coordinate scarce firm resources and is often exposed to increased conflicts between shareholders, creditors, suppliers, and other stakeholders (Trahms et al., 2013). Financial distress puts the company at risk of a potential payment default, which can ultimately end in the extreme case of bankruptcy (Altman, 1968; Altman, 2018). For family-owned firms, family owners and family managers are likely to take strategic and operational decisions that are not solely based on economic principles but also on their socioemotional considerations (Berrone et al., 2012).

Prior research already establishes that family firms are wide-spread not only amongst private firms (Claessens et al., 2000; Faccio & Lang, 2002; Anderson & Reeb, 2003), but also amongst stock-listed companies (Anderson et al., 2003; Villalonga et al., 2020). While various papers contribute to the performance literature on family firms (Villalonga & Amit, 2006; Villalonga et al., 2020), only few papers have focused on family firms in financial distress (Wilson et al., 2013; Gottardo & Moisello, 2017; Gomez-Mejia et al., 2022). Gaining a thorough understanding of how family-owned firms operate in the context of financial distress is relevant for minority shareholders, creditors and employees, which would be adversely impacted by deteriorating firm performance and the potential risk of bankruptcy.

Our paper examines a sample of 13,127 firm-year observations of 185 family-owned and 432 non-family-owned publicly listed S&P 500 firms from 1995 to 2019 to examine publicly listed family-owned firms in the context of financial distress. We base our definition of financial distress on the research of Altman (Altman, 1968; Altman et al.,

1995; Altman, 2002). The Altman Z'' score represents a financial distress measure that predicts the likelihood of bankruptcy filing for a company within two years (Altman, 2018). Our analysis consists of two parts to examine (i) whether family-owned firms have a lower propensity to become financially distressed and (ii) whether distressed family-owned firms are characterized by a different liquidity, cashflow and financial structure compared to distressed non-family-owned firms. We expect that family-owned firms have financial metrics that would optimize their ability to pay creditors during financial distress in order to decrease the likelihood of bankruptcy, which would endanger the family's entire socioemotional and economic wealth.

In the first part of our analyses, we start out by running logit and linear regression analyses of family ownership on various measures of financial distress based on the Altman-Z'' score. The focus of the first analyses is to test whether family ownership impacts the likelihood of financial distress. Our second part of the analysis focuses on firms in distress to examine whether family-owned firms in distress have different liquidity and capital structure characteristics as compared to non-family-owned firms. We start by testing the impact of family firms on various financial variables under the influence of financial distress by running linear regression analyses with two-way interaction effects. To build on this analysis, we further analyse the extreme case of financial distress by building a propensity score matched sample to match the non-family-owned firms that filed for chapter 11 to family-owned firms that did not file for bankruptcy.

The regression results of the first part of our analysis show that publicly listed family-owned firms have a lower propensity to be in financial distress. In practical terms, family-owned firms have a 75 percent lower likelihood to be in financial distress in terms of their Altman-Z'' score. The results of the second part of analyses show that when family-owned firms are in financial distress they are characterized by a more prudent capitalization in terms of higher cash reserves, a higher equity capitalization, more equity issuance and higher cashflows from financing activities. During distress, family-owned firms are associated with a significantly higher cash position compared to non-family-owned firms, in the magnitude of a 0.1 higher ratio of cash to total assets. While family-owned firms have a higher equity position in both non-distress and distress years, the effect is much more pronounced during financial distress years. In

line, our results further indicate that in financial distress years family-owned firms are associated with higher stock issuance. Furthermore, while family-owned firms have lower leverage during non-financial distress years, the impact is fully reversed during financial distress years. In line with both the equity and leverage findings, family firms are associated with significantly higher financing cashflows during financial distress years.

Overall, the results indicate that family-owned firms tilt towards a more conservative liquidity position during years of distress which coupled with a significantly more conservative equity position may support companies to navigate distress without the exposure to payment defaults and the corresponding risk of bankruptcy, which could put an end to the family firm legacy. Our findings are in line with our descriptive statistics that show that for our sample only one family-owned firm in the S&P 500 filed for chapter 11 bankruptcy over the time period 1995 to 2019. This matches with prior research of private family firms which conclude that privately held family firms are associated with a lower propensity of bankruptcy (Wilson et al., 2013; Gottardo & Moisello, 2017).

Our paper builds on the existing management literature on distress on one hand, and the research on family firms on the other hand. While various management research streams have added to the distress literature (D'Aveni, 1990; Daily & Dalton, 1994; Fich & Slezak, 2008), only little focus has been on ownership structure (Abebe & Tangpong, 2018). At the same time, various research streams have examined the performance of family firms, but only few papers in the family firm literature have narrowed in on financial distress and firm survival (Wilson et al., 2013; Gottardo & Moisello, 2017; Gomez-Mejia et al., 2022). Furthermore, we extend the literature on socioemotional wealth theory (Berrone et al., 2012; Gomez-Mejia et al., 2011) by examining financial distress as a threat to firm survival. Our paper is positioned at the intersection of management, family firm and finance literature. It extends the various research streams by studying family ownership in the adverse context of financial distress.

2 Theoretical Background

The challenges that a firm faces during financial distress differ significantly to those faced during a stable non-decline phase (Trahms et al., 2013). Financial distress tends to put pressure on the resources of a firm and deepens conflicts of interest between the various stakeholder groups (Trams et al., 2013). The threat of financial distress and the risk of bankruptcy is especially relevant for a firm's stakeholders since all types of firms are exposed to the risks of organizational decline due to both external macroeconomic factors and internal firm-specific factors (Trahms et al., 2013). However, for family owners, financial distress does not only threaten their concentrated equity stake, but also their socioemotional wealth (Berrone et al., 2012). The socioemotional wealth of family owners refers to the non-economic endowment that comes with the intangible benefits of family ownership including their influence in the firm's strategy, their position of power amongst key stakeholder groups, the emotional attachment to the firm's history and their reputation as family owners (Berrone et al., 2012, Miller & Le Breton-Miller, 2014). When the socioemotional endowment is at risk, family owners and family managers may form decisions that are not solely based on economic logic (Berrone et al., 2012).

Family owners and family managers may differ both in their willingness and their ability to steer the firm's resources in years of financial distress compared to the leadership team of non-family-owned firms. In terms of willingness, family-owned firms are likely to have stronger incentives to navigate distress to avoid chapter 11 bankruptcy. From a financial perspective, family owners frequently rely on a concentrated equity position in the family-owned firms and have a longer investment horizon compared to other shareholders (Anderson et al., 2003). In addition, economic exposure can also be in terms of other types of compensation for the family's involvement in the management or board (Villalonga et al., 2020). In addition, family owners also benefit from non-financial returns through their socioemotional endowment in the family-owned firm (Gomez-Mejia et al., 2007). Family owners often intend to preserve the reputation of the firm since it can directly reflect on the personal reputation of family members (Burkart et al., 2003). In the extreme case, bankruptcy would endanger the survival of the firm and therefore, could result in a total loss of both economic capital and socioemotional wealth for family owners.

In terms of ability, there are multiple characteristics of family-owned firms that give family shareholders and family managers a better lever to impact the course of action of the firm compared to non-family-owned firms. Financial distress creates a unique situation in which scarce resources need to be allocated in an environment of increased stakeholder supervision. Due to family owners frequent dual role as shareholders and managers (Villalonga et al., 2015), family-owned firms are likely able to take more decisive decisions in times of distress. Moreover, family firms also often have a dual class shareholder structure which gives the family owners more voting rights as compared to other shareholders (Anderson et al., 2012). Furthermore, with their emotional attachment and personal identification with the firm, family owners may also be incentivized to bring in their own personal expertise, network, and resources to ensure the long-term performance of the firm (Anderson et al., 2003). The extensive knowledge of the firms' activities and industry dynamics, as well as the profound network of family owners, may be a key resource for the firm's recovery. Moreover, due to the long-term investment horizon and the family history (Bertrand & Schoar, 2006), family-owned firms often have strong long-term relationships with stakeholders including employees, customers, suppliers, advisors, and creditors (Berrone et al., 2012).

Several papers have examined the relationship between governance and management characteristics on distress, turnaround, and bankruptcy (D'Aveni, 1990; Daily & Dalton, 1994; Fich & Slezak, 2008; Abebe & Tangpong, 2018). Yet only few papers have examined family firms in this context (Wilson et al., 2013; Gottardo & Moisello, 2017; Gomez-Mejia et al., 2022). In the broader management literature, D'Aveni (1990) examines the relationship between top management team characteristics and the propensity to file for bankruptcy. Their findings suggest that political and board connections have a negative relation with bankruptcy (D'Aveni, 1990). Daily and Dalton (1994) and Fich and Slezak (2008) further examine the impact of governance characteristics. Daily and Dalton's (1994) findings suggest that bankrupt firms are associated with fewer independent board members and CEO-chairman duality. Fich and Slezak (2008) find that distressed firms with smaller boards and independent boards are more likely to avoid bankruptcy. Abebe and Tangpong (2018) extend the research by examining the role of founder CEOs in the turnaround of declining stock-listed firms.

Their results indicate that declining firms with founder CEOs are more likely have turnaround success (Abebe & Tangpong, 2018).

In the context of family firm research, Wilson et al. (2013) study the firm survival of private family firms in Great Britain. Their findings suggest that family firms are associated with a higher likelihood of firm survival compared to non-family firms (Wilson et al., 2013). Building on the research of Wilson et al. (2013), Gottardo and Moisello (2017) examine the bankruptcy probability of private Italian family firms and find that family firms are less likely to be in a bankruptcy procedure compared to non-family firms (Gottardo & Moisello, 2017). Furthermore, Gomez-Mejia et al. (2022) study the risk return trade-off of family firms in the context of distress. Their findings suggest that family firms get higher financial returns from taking risks during financial distress and lower financial returns from risk taking during non-distress periods (Gomez-Mejia et al., 2022).

Our research is placed at the intersection of management, family firm and finance literature streams. We extend the management literature on financial distress (D'Aveni, 1990; Daily & Dalton, 1994; Fich & Slezak, 2008; Abebe & Tangpong, 2018) and the family firm research on financial distress (Wilson et al., 2013; Gottardo and Moisello, 2017; Gomez-Mejia et al., 2022) in two key manners. Firstly, we study the propensity of publicly listed family-owned firms to be in financial distress. Secondly, we narrow in on distressed firms to analyse the differences in firm characteristics between family-owned firms and non-family-owned firms in financial distress. We contribute to the literature streams by analysing the unique ownership structure of family-owned firms in the high-stakes environment of financial distress.

3 Sample and Research Methodology

3.1 Sample

The sample includes all publicly listed US companies that are part of the S&P 500 in at least one year during the period from 1995 to 2019. The sample period starts in 1995 since the proxy statements needed to identify family-owned firms are only digitalized in the Edgar database from 1994 onwards. The sample excludes certain firms in the public utilities (SIC Codes 4812, 4813, 4911 to 4991) and financial services (SIC codes

6020 to 6799) industries since those firms are characterized by unique firm characteristics (Anderson et al., 2003). Our final sample consists of 13,127 firm-years of annual panel data for 728 firms in the S&P 500 from 1995 to 2019. The 728 sample firms are comprised of 185 family-owned firms and 432 non-family-owned firms.

We manually hand-collect the information on family ownership and family governance for each year of the 25-year period from the published annual proxy statements. The information from the proxy statements is then combined with other sources on company history (FundingUniverse.com, LexisNexis, Factiva and websites) in order to determine the founder and founding family members. We calculate the ownership stake as the aggregate number of shares that members of the founding family own divided by the total number of outstanding shares. All classes of shares are considered for dual class share structures. Following prior research, we use the definition of a family-owned firm as a firm in which the founding family has an equity stake of at least 5% (Anderson et al., 2003; Villalonga et al., 2020). In addition to ownership data, we also collect information about the involvement of the family in management. For the positions of CEO and chairman of the board, we check whether the position is held by the founder, a family member of the founding family or an externally hired professional.

For the identification of chapter 11 bankruptcy filings, we use the UCLA-LoPucki Bankruptcy Research Database. The database entails the bankruptcy filings of large stock-listed US firms. We complement the dataset with an extensive number of accounting and financial variables from the WRDS Research Database in order to account for firm characteristics. All variables are collected annually as per the firm's financial year-end.

3.2 Methodology

Our analyses are based on the Altman Z-score (Altman, 1968), which is used as a measure of financial distress that predicts the likelihood of a company to file for bankruptcy within the following two years. The original Altman Z-score was determined based on a sample of publicly listed manufacturing companies (Altman, 1968).

The Altman Z score is calculated as follows:

$$\begin{aligned} \text{Altman Z Score} = & 1.2 * \frac{\text{working capital}}{\text{total assets}} + 1.4 * \frac{\text{retained earnings}}{\text{total assets}} + 3.3 * \frac{\text{ebit}}{\text{total assets}} \\ & + 0.6 * \frac{\text{market equity}}{\text{total liabilities}} + 0.999 * \frac{\text{sales}}{\text{total assets}} \end{aligned}$$

Building on the research, further variations of the Z-Score were developed, with the Altman-Z' score for private manufacturing firms (Altman, 1983) and the Altman-Z'' score for publicly listed and privately held firms in all industries (Altman et al., 1995; Altman, 2002).

The Altman Z'' score is computed as follows:

$$\begin{aligned} \text{Altman Z'' Score} = & 6.56 * \frac{\text{working capital}}{\text{total assets}} + 3.26 * \frac{\text{retained earnings}}{\text{total assets}} \\ & + 6.72 * \frac{\text{ebit}}{\text{total assets}} + 1.05 * \frac{\text{equity}}{\text{total liabilities}} \end{aligned}$$

The Altman Z'' model (Altman et al., 1995) uses book equity instead of market equity to be applicable to both public and private firms. The sales ratio in the Altman Z score is not used in the Altman-Z'' score since the variable is sensitive to industry differences (Altman, 2018).

The Altman scores are interpreted based on cutoff scores that distinguish between a safe zone, a grey zone, and a distress zone (Altman, 2018), with each Altman-Z score having different cutoff values for the zones. Our main analyses use the Altman-Z'' score to classify firms as financially distressed (Altman et al., 1995; Altman, 2018). A firm is considered as healthy when it has an Altman-Z'' score of more than 2.6 (safe zone). Firms with an Altman-Z'' score of 1.1 to 2.6 are considered in a grey zone, while firms with an Altman-Z'' score of less than 1.1 are distressed (Altman, 1968; Altman et al., 1995; Altman, 2002).

Our first regression analysis in Table 5 tests the impact of family ownership on financial distress metrics. We perform various linear and logit regression analysis. The first dependent variable is the Altman Z'' score.

$$AltmanZ''_{i,t} = a + \beta_1(FamFirm_{i,t}) + \beta_2(Employees_{i,t}) + \beta_3(PPENT_{i,t}) + \beta_4(Leverage_{i,t}) + \beta_5(Time_{i,t}) + \beta_6(Industry_{i,t}) + \varepsilon \quad (1)$$

The second and third dependent variables are distress dummy variables that take the value of 1 if the firm has an Altman-Z'' score that is smaller than 1.1 (Altman Dummy 1) and 2.6 (Altman Dummy 2), respectively. Our explanatory variable is the family-owned firm dummy variable which has the value of 1 if the founding family has an ownership stake of more than 5 percent. The control variables are number of employees as a measure of firm size (Employees), tangible assets ratio calculated as property, plant and equipment divided by total assets (PPENT) and leverage defined as total debt divided by total assets (Leverage).

Our second analyses in Table 6 use interaction effects to examine the impact of family ownership and financial distress on firm characteristics. We perform eight linear regression analyses with family firm and distress interaction effects. The dependent variables are cash ratio (cash & equivalents to total assets), equity ratio (equity to total assets), equity issuance ratio (equity issuance to total assets in percentage), short-term debt ratio (short-term debt to total debt), leverage ratio (total debt to total assets), financing cashflows ratio (cashflows from financing activities to total assets), capex ratio (capex to total assets), and employee growth ((employees_t-employees_{t-1})/employees_t). The explanatory variables are the family firm dummy variable for family ownership and the Altman dummy 1 for financial distress. In addition, we have a similar analysis with subsamples in Appendix 5A-C to test robustness.

$$Cash Ratio_{i,t} = a + \beta_1(FamFirm_{i,t}) + \beta_2(Distress Dummy 1_{i,t}) + \beta_3(FamFirm_{i,t})(Distress Dummy 1_{i,t}) + \beta_4(Revenues_{i,t}) + \beta_5(PPENT_{i,t}) + \beta_6(Leverage_{i,t}) + \beta_7(Time_{i,t}) + \beta_8(Industry_{i,t}) + \varepsilon \quad (2)$$

The third part analyses the extreme scenario of severe distress by creating a subsample based on propensity score matching. We take the subsample of non-family-owned companies that filed for chapter 11 and match it with family-owned firms that did not file for chapter 11. The matching is performance based on the Altman Z'' score and the negative net income dummy in the year prior to Chapter 11. We use the k-nearest neighbour (KNN) approach with k set at two. For this propensity-score matched sample, we run various linear and logit regressions in order to test the impact of family-ownership on capitalization and liquidity for distressed companies. The dependent variables include the cash ratio (cash to total assets), equity ratio (equity to total assets), equity issuance ratio (equity issuance to total assets in percentage) and short-term debt ratio (short-term debt divided by total debt).

4 Results

4.1 Descriptive Statistics

Table 1 displays the descriptive statistics of the entire sample of 728 S&P 500 companies over the period 1995 to 2019. The sample has mean total asset of 14bn, a mean EBITDA margin (Ebitda/revenues) of 18 percent, a mean EBIT margin (Ebit/revenues) of 12 percent, a mean leverage ratio (total debt/total assets) of 0.26, a mean return on assets ratio (Ebit/total assets) of 0.11, a mean cash ratio (cash & equivalents/total assets) of 14 percent, a mean equity ratio (equity/total assets) of 41 percent, a mean equity issuance ratio (equity issuance/total assets) of 2 percent, a mean liquidity ratio (current assets/current liabilities) of 2.00, and a mean interest coverage (Ebit/total interest) ratio of 28 percent.

In terms of distress variables, the mean Altman Z score and Altman Z'' score of S&P 500 companies is 4.7 and 3.7, respectively, representing a healthy mean score. However, ca. 14 percent of firm-years of the entire sample have an Altman Z'' score of less than 1.11 (bankruptcy dummy 1), which indicates that the firm is in financial distress and is at risk to file for bankruptcy in the following 2 years. Furthermore, ca. 36 percent of firm-years have an Altman Z'' score (Altman Dummy 2) below 2.6, which indicates that the firms aren't in a healthy state in those years. Looking further at profitability, ca. 15 percent of firm-years have negative net income and ca. 7 percent have negative EBIT. In terms of companies, 315 companies out of the 728 sample

companies (ca. 43 percent) had a Altman Z'' score of less than 1.1 and 302 (ca. 41 percent) had negative net income in at least one sample year. These descriptive statistics show that financial challenges are common amongst S&P 500 firms.

The sample consists of 185 family-owned firms and 543 non-family-owned firms. In terms of family ownership, the mean family stake that the founding family holds in the family-owned firm is 19.14 percent, which is in line with prior research (Anderson & Reeb, 2003). The smallest family stake in our sample is 5 percent (as the definition of family-owned firm has a threshold of 5 percent) and the largest stake is 74 percent. Of the family-owned subsample, for 72 percent a family member (founder or descendent) holds the position of the CEO or chairman, while for 44 percent the founder still holds the position of the CEO or chairman.

[Insert Table 1 here]

Table 2 shows the univariate statistics of the firm variables and distress variables for family owned and non-family-owned S&P500 companies. Consistent with prior research (Anderson et al, 2003; Villalonga et al, 2020) family-owned firms are significantly smaller in terms of total assets (11.4bn vs 15.3bn USD). Overall, family-owned firms show significantly lower mean leverage (total debt to total assets of 0.21 compared to 0.27), higher mean cash ratio (total cash to total assets of 0.16 compared to 0.14), mean equity ratio (equity to total assets of 0.48 compared to 0.39), higher mean liquidity (current assets to current liabilities of 2.25 compared to 1.95)) and higher mean interest coverage (EBIT divided by total interest of 47.5 compared to 23.92). The t-statistics of the difference in mean of the various variables indicate that there are significant differences in firm characteristics between family-owned firms and non-family-owned firms. The differences are consistent with prior literature that suggests that family firms may act more risk-averse and conservative (Gonzalez et al., 2021).

In terms of our distress variables, the mean Altman Z'' score of family-owned firms is significantly higher with 5.97 compared to that of 4.38 for non-family-owned firms, indicating an on average better financial health of family-owned firms. For ca. 7 percent of family-owned firm-years the Altman-Z'' score is less than 1.1, which is much lower compared to 16 percent of non-family-owned firm years. This indicates that it's less

common for family-owned firms to have financial metrics that would indicate a bankruptcy within the following two years. This is also confirmed on a company level instead of firm-year level, since only 21 percent of family-owned firms experienced a year of an Altman-Z'' score less than 1.1 within the entire sample period in comparison to 49 percent of non-family-owned firms. Similarly, when extending the AltmanZ'' score to also include the companies in the grey zone (score of less than 2.6), for family-owned firms the percentage share of firm-years is 23% as compared to that of non-family-owned firms of 38%. This also indicates that family-owned firms are more often operating with healthy financial metrics. Furthermore, in terms of profitability, family-owned firms and non-family-owned firms have negative net income in 12 percent and 16 percent of firm-years, respectively.

[Insert Table 2 here]

We further gather all chapter 11 filings for our sample of S&P 500 firms. Table 3 shows the distribution of chapter 11 filings of S&P 500 firms per year from 1996 to 2020. Of our sample firms, 6 percent of firms (45 firms) filed for Chapter 11 during our sample period. This further shows that financial distress is not an uncommon issue for even large publicly listed firms. However, the number of chapter 11 filings is almost completely driven by non-family-owned firms. Only one family-owned firm filed for chapter 11, which represents only 0.5 percent of the family-firm subsample. This descriptive finding further indicates differences between family-owned and non-family-owned firms in terms of navigating financial distress.

[Insert Table 3 here]

Lastly, we also investigate the subsample of family-owned firms. Table 4 shows the univariate statistics of the firm variables and distress variables for the subsample of family-owned firms in terms of founder-run firms and non-founder-run firms. Founder-run is defined as a family-owned firm where the founder is in the position of CEO or chairman of the board. The univariate statistics show that founder-run firms are larger in terms of total assets (14.3bn compared to 9.2bn USD), have a lower mean leverage (0.19 compared to 0.22), higher cash ratio (0.23 compared to 0.11), higher mean equity

issuance (0.03 compared to 0.01), higher liquidity (2.58 compared to 1.99) and a higher mean interest coverage ratio (73.25 compared to 30.02). Overall, the descriptive statistics indicate that the financial differences of family-owned and non-family-owned firms as described in Table 2 are amplified to founder-run firms in the subsample of only family-owned firms.

Furthermore, the mean Altman-Z'' score of founder-run firms with 4.99 is higher than that of other family-owned firms with 4.45. However, in contrast, founder-run firms have a higher percentage of firm-years in financial distress (Altman Z'' score of less than 1.1) with 10 percent compared to 5 percent, respectively. They also have a higher percentage of firm-years with negative net income compared to other family-owned firms (14 percent compared to 10 percent).

[Insert Table 4 here]

4.2 Regression Results

We start by analyzing the impact of family ownership on the likelihood of financial distress for S&P 500 companies. We conduct three different panel data linear and logit regression analysis with the Altman Z'' score and the Distress Dummy 1 and 2. The Distress Dummy 1 and 2 are dummy variables that indicate whether the Altman-Z'' score for that firm in that year is below 1.1 (distressed zone) and 2.6 (grey zone), respectively. The main explanatory variable is the family dummy (FamFirm) variable that has the value of 1 if the family owns more than 5% of the firm's equity. The analysis includes total employees, PPENT ratio and leverage ratio as control variables as well as industry and year fixed effects to control for firm characteristics.

The results in the first column in Table 6 show that family ownership is associated with a higher Altman Z'' score, which indicates that family-ownership is associated with better financial health. The impact of family ownership equates to a ca. 0.44 higher AltmanZ'' score. Furthermore, the results in the second and third columns show that family firms are associated with a lower likelihood of having an Altman-Z'' score of below 1.1 and 2.6, respectively. This indicates that family-owned firms are associated with a lower likelihood to be in financial distress and are less likely to file for

bankruptcy within the next 2 years. The odds of family-owned firms to be in distress with an Altman” score of less than 1.1 is 71% lower compared to non-family-owned firms.

[Insert Table 5 here]

Next, we examine the impact of family ownership on firm characteristics under the influence of financial distress. We specifically examine the firm characteristics related to liquidity position, capital structure and investments. Table 6 shows the results of the eight linear regression analyses with two-way interaction effects of family firm and financial distress. We also perform a similar analysis with subsamples instead of interaction effects in Appendix 5A-C to confirm the robustness of our results. The dependent variables are cash ratio (cash & equivalents to total assets), equity ratio (equity total assets), equity issuance ratio (equity issuance to total assets), short-term debt ratio (short-term debt) to total debt, leverage (total debt to total assets), financing cashflows (cashflows from financing activities to total assets), capex (capex to total assets), and employee growth $((\text{employees}_t - \text{employees}_{t-1}) / \text{employees}_t)$.

Firstly, we examine the liquidity position and equity cushion. The results in column 1 show that family firms are associated with a slightly higher cash position in non-distress years, however, this association is strongly amplified in financial distress with a significantly higher cash position. The magnitude is meaningful with family-owned firms being associated with a 0.1 higher ratio of cash to total assets during financial distress years compared to non-family-owned firms, which is in contrast to a 0.01 higher cash ratio during non-distress years. Column 2 shows that family-owned firms have a significantly higher equity ratio, which is amplified during financial distress. The impact equals a 0.05 higher ratio of equity to total assets of family-owned firms in financial distress years compared to non-family-owned firms. Next, column 3 shows that in non-financial distress years family-owned firms don’t have a significant impact on stock issuance, however, in financial distress years family-owned firms are associated with a 1.4 percentage points higher equity issuance ratio compared to non-family-owned firms.

Secondly, we examine debt and financial cashflows. Column 5 examines the leverage ratio and shows that while family-owned firms are associated with lower leverage

during non-distress years, the effect is fully reversed during financial distress years. In terms of financing cashflows column 6 indicates that family-owned firms are associated with slightly higher financial cashflows during non-distress years, but that the effect is amplified during financial distress years with family-owned firms being associated with 0.04 higher ratio of financing cashflows to total assets during distress years compared to non-family-owned firms.

Thirdly, we examine capex and growth metrics. In terms of capex, column 7 indicates that family-owned firms are associated with more capex during both financial distress and non-distress years. Column 8 shows that while family-owned firms have slightly higher employee growth in non-distress years, family-owned firms are associated with higher employee growth in financial distress years.

[Insert Table 6 here]

Finally, we independently analyse the firms that filed for chapter 11 in order to examine the extreme case of financial distress. We use propensity matching to match the subsample of non-family-owned firms that filed for chapter 11 with similar family-owned firms that did not file for chapter 11 based on the Altman Z'' score and a negative net income dummy in the year before the chapter 11 filing. The matching algorithm is based on k-nearest neighbour matching (with k equal to two). Table 8 displays the univariate statistics of the full propensity score matched sample and the family-owned and non-family-owned subsamples. The table supports the prior findings of our regression analysis. The distressed family-owned firms that did not file for chapter 11 have on average a significantly a higher mean cash ratio (0.24 compared to 0.09), a higher mean equity ratio (0.36 compared to -0.08), a higher equity issuance ratio (0.05 compared to 0.01), and less mean short-term debt (0.24 compared to 0.42) compared to the firms that filed for chapter 11. In fact, the mean equity ratio of the non-family-owned firms that filed for chapter 11 is negative.

[Insert Table 7 here]

Lastly, we use the propensity score matched sample to run various panel linear regression analyses for the dependent variables cash ratio (cash to total assets), equity ratio (equity to total assets), equity issuance ratio (equity issuance to total assets), and short-term debt ratio (short-term debt to total debt). Column 1 confirms that even for this extreme subsample, family-owned firms are associated with a significantly higher cash position with family-owned firms being associated with 0.13 higher cash to total assets ratio. Moreover, column 2 shows that family-owned firms have a higher equity ratio with 0.33 higher equity to total assets ratio. While column 3 shows that family-owned firms are associated with a higher equity issuance (albeit only at the 10 percent confidence level), column 4 shows that family-owned firms have a more conservative short-term debt to total debt ratio. Our results confirm that the family-owned firms, that are comparable to the firms that filed for chapter 11 in terms of financial distress, hold a higher cash and equity cushion and have less short-term debt compared to the firms that filed for chapter 11.

[Insert Table 8 here]

Overall, the results of our paper are two-fold. Firstly, our results show that family-owned firms have a lower likelihood to be in financial distress with a distressed Altman-Z' score. Secondly, our results suggest that when already in financial distress, then family-owned firms have a better liquidity position and equity capitalization with better cash and equity ratio, higher equity issuance and higher financing cashflows compared to non-family-owned firms.

5 Robustness Tests

In order to test the robustness of our results, we conduct various additional analyses in the appendix. Firstly, appendix 4A and 4B show additional robustness analyses to support our main analyses of the impact of family ownership on the likelihood of financial distress in Table 5. In the panel A of appendix 4A we replace the explanatory family firm dummy variable with a continuous family stake variable that represents the aggregate share of equity that family members own. This analysis is included to test whether the impact of family ownership also holds for a continuous ownership variable

instead of a dummy variable. The results of all three columns stay significant with Altman Z'', Altman Dummy 1 and Altman Dummy 2 as dependent variables (albeit columns 2 and 3 have a lower level of significance of 5 percent).

Next, in panel B of appendix 4A we replace the dependent variables of the Altman-Z'' score and the related Dummy Variables with the original Altman-Z score and the corresponding dummy variables at the 1.8 and 3 thresholds, respectively. This robustness test is performed in order to ensure that our analysis is not contingent on the specification of the Altman-Z'' score. In line with our main results all columns remain significant at the 1 percent level.

Furthermore, panel C of appendix 4 shows the analyses for subsamples in terms of firm size. We form a subsample of firms in our sample that have above average total assets (big firm subsample) and another subsample with below average total assets (small firm subsample). The inclusion of this subsample analysis is meant to ensure that our results are robust at varying levels of firm size within the S&P 500. The results are consistent with our main analysis and show that the effect is more pronounced for larger firms than for smaller firms.

[Insert Appendix 4A and 4B here]

Furthermore, appendix 5A, B and C show the robustness tests for our main analyses in Table 6. The tables display the corresponding analyses with subsample analyses instead of interaction effects. We include the analyses in order to ensure that our results are also robust when examining the various subsamples. The results of the subsample analyses are in line with our main analyses with interaction effects and give additional insights into the coefficients for the different subsamples. Panel A of appendix 5A indicates that family-owned firms are associated with 0.11 higher ratio of cash to total assets during distress years, while in contrast, there is no association in the non-distress years. Panel B of appendix 5A confirms that family-owned firms have higher stock issuance only during distress years with the full sample and the non-distress sample showing no significant impact. In practical terms, the results indicate that family-owned firms issue more equity in the amount of 1.60 percentage points of total assets compared to non-

family-owned firms. Panel C of appendix 5A and panel D of appendix 5B show that the coefficient for the equity and short-term debt analyses is significant for both distress and non-distress subsamples, but more pronounced for the distress subsample.

Panel E of appendix 5B shows that while family-owned firms are associated with lower leverage during non-distress years, there is no significant difference in the leverage ratio during distress years. In line with the equity issuance and leverage results, Panel F of appendix 5B confirms that family-owned firms have a significantly higher financing cashflow ratio during distress years. Panel G of appendix 5C shows the significant impact of family firms on capex for both distress and non-distress subsamples.

[Insert Appendix 5A, 5B, 5C here]

6 Conclusion

Financial distress forces a company to navigate through scarce resources and increased stakeholder conflict (Trahms et al., 2013). While various family firm research streams have analyzed the overall performance of family-owned firms (Villalonga et al., 2020), only few papers have examined family-owned firms in distress (Wilson et al., 2013; Gottardo & Moisello, 2017). At the same time, various research streams have contributed to the distress literature (D'Aveni, 1990; Daily & Dalton, 1994; Fich & Slezak, 2008; Abebe & Tangpong, 2018), but few papers have focused on ownership structure (Abebe & Tangpong, 2018). Our paper adds to the existing literature by examining family-owned and non-family owned publicly listed firms in financial distress.

We examine a sample of 728 publicly listed S&P 500 firms from 1995 to 2019, resulting in sample of 13,127 firm years. In part one of our analyses, we examine whether family-owned firms have a lower propensity of financial distress. Our results confirm that family-owned firms are associated with a significantly lower likelihood of financial distress. In terms of magnitude, the propensity to have an AltmanZ” score of less than 1.1., which would indicate a high likelihood of bankruptcy within 2 years, is 75 percent lower compared to non-family-owned firms.

The second part of our analyses focuses on firms that are in financial distress and analyses whether family-owned and non-family-owned firms have different capital structure and liquidity characteristics when in distress. Our results indicate that family-owned firms go through financial distress with a more conservative liquidity position and equity capitalization. Firstly, family-owned firms have a higher cash position in financial distress years which in magnitude amounts to a 0.1 higher ratio of cash to total assets compared to non-family-owned firms. Secondly, family-owned firms have a higher equity to total assets ratio compared to non-family-owned firms during distress. Thirdly, in financial distress years family-owned firms are associated with higher stock issuance. In terms of leverage, our results show that family-owned firms are associated with lower leverage during non-financial distress years compared to non-family-owned firms, however, this impact is fully reversed during financial distress years. In line with the impact on equity and leverage, family ownership is associated with significantly higher financing cashflows during financial distress years.

Our analysis contributes to the academic literature of family firms (Villalonga et al., 2020) by examining family firm characteristics during the adverse circumstances of financial distress. This study can also be relevant in terms of practical implications for stakeholders of family-owned firms, for whom financial distress and the associated bankruptcy risks can have severe adverse implications.

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Table 1

Descriptive Statistics

This table displays the descriptive statistics of firm characteristics for our sample of 728 S&P 500 firms during the period from 1995 to 2019. The table includes firm variables in Panel A, distress variables in Panel B and family firm variables in Panel C. The data is winsorized at the 1% level. The total assets variable is displayed in USD millions. The variables are described in detail in Appendix 1.

	Mean	SD	Median	P25	P75	Min	Max
Panel A: Firm Variables							
Total Assets	14,586.16	28,876.81	5,159.72	2,115.55	13,716.20	72.87	199,581.00
Ebitda Margin	0.18	0.15	0.17	0.10	0.25	-0.65	0.62
Ebit Margin	0.12	0.16	0.12	0.06	0.19	-0.97	0.46
Leverage	0.26	0.18	0.24	0.13	0.36	0.00	0.90
ROA	0.11	0.09	0.10	0.06	0.15	-0.25	0.35
Cash Ratio	0.14	0.16	0.08	0.03	0.19	0.00	0.76
Capex Ratio	0.05	0.05	0.04	0.02	0.07	0.00	0.26
Working Capital Ratio	0.18	0.18	0.14	0.04	0.28	-0.15	0.73
Receivables Ratio	0.15	0.12	0.14	0.09	0.19	0.00	0.80
Equity Ratio	0.41	0.23	0.42	0.28	0.56	-0.41	0.88
Equity Issuance Ratio	0.02	0.04	0.01	0.00	0.01	0.00	0.42
Liquidity	2.00	1.33	1.63	1.19	2.36	0.45	8.64
Interest Coverage	27.89	89.53	7.47	3.32	15.86	-27.20	731.67
Short-term debt Ratio	0.17	0.23	0.08	0.01	0.22	0.00	1.00
Panel B: Distress Variables							
Altman Z Score	4.67	4.62	3.48	2.27	5.33	-1.78	31.30
Altman Z' Score	3.69	3.21	3.45	1.96	5.28	-8.73	13.95
Altman Dummy 1	0.14	0.35	0.00	0.00	0.00	0.00	1.00
Altman Dummy 2	0.36	0.48	0.00	0.00	1.00	0.00	1.00
Negative EBIT	0.07	0.26	0.00	0.00	0.00	0.00	1.00
Negative Net Income	0.15	0.36	0.00	0.00	0.00	0.00	1.00
Panel C: Family Heterogeneity for Family-Owned Subsample							
CEO/Chairman Founder	0.44	0.50	0.00	0.00	1.00	0.00	1.00
CEO/Chairman Family	0.72	0.45	1.00	0.00	1.00	0.00	1.00
Family Stake	19.14	12.91	15.00	9.10	25.80	5.00	74.00

Table 2

Univariate Statistics

This table displays the univariate statistics of firm characteristics for our sample of 728 S&P 500 firms during the period from 1995 to 2019. The overview shows the statistics for the entire sample and subsamples of family-owned and non-family-owned firms. The variables are winsorized at the 1% level. The total assets variable is displayed in USD millions. The variables are described in detail in Appendix 1.

	Entire Sample			Family-Owned Firms			Non-Family-Owned Firms			Difference of Mean	
	Mean	SD	Median	Mean (1)	SD	Median	Mean (2)	SD	Median	[(1)-(2)]	t-statistic
Panel A: Firm Variables											
Total Assets	14,586.16	28,876.81	5,159.72	11,431.95	29,137.07	3,132.12	15,283.40	28,773.74	5,717.60	-3851.45***	(-5.8)
Ebitda Margin	0.18	0.15	0.17	0.15	0.14	0.15	0.18	0.16	0.17	-0.03***	(-7.9)
Ebit Margin	0.12	0.16	0.12	0.10	0.16	0.11	0.12	0.16	0.12	-0.01***	(-3.8)
Leverage	0.26	0.18	0.24	0.21	0.18	0.18	0.27	0.18	0.25	-0.06***	(-14.4)
ROA	0.11	0.09	0.10	0.11	0.09	0.11	0.10	0.09	0.10	0.01***	(4.5)
Cash Ratio	0.14	0.16	0.08	0.16	0.17	0.10	0.14	0.15	0.08	0.03***	(7.9)
Capex Ratio	0.05	0.05	0.04	0.06	0.05	0.04	0.05	0.05	0.04	0.01***	(5.3)
Working Capital Ratio	0.18	0.18	0.14	0.22	0.19	0.20	0.17	0.18	0.13	0.05***	(12.6)
Receivables Ratio	0.15	0.12	0.14	0.14	0.10	0.14	0.16	0.12	0.14	-0.01***	(4.9)
Equity Ratio	0.41	0.23	0.42	0.48	0.21	0.47	0.39	0.23	0.40	0.08***	(17.1)
Equity Issuance Ratio	0.02	0.04	0.01	0.02	0.04	0.01	0.02	0.05	0.01	0.30***	(9.5)
Liquidity	2.00	1.33	1.63	2.25	1.47	1.86	1.95	1.29f	1.58	0.30***	(9.5)
Interest Coverage	27.89	89.53	7.47	47.94	127.51	9.39	23.92	79.30	7.16	24.02***	(10.9)
Short-term debt Ratio	0.17	0.23	0.08	0.21	0.27	0.10	0.16	0.22	0.07	0.05***	(9.1)
Panel B: Distress Variables											
Altman Z Score	4.67	4.62	3.48	5.97	5.49	4.38	4.38	4.36	3.31	1.59***	(14.7)
Altman Z' Score	3.69	3.21	3.45	4.69	3.40	4.23	3.47	3.13	3.27	1.21***	(16.1)
Altman Dummy 1	0.14	0.35	0.00	0.07	0.25	0.00	0.16	0.36	0.00	-0.09***	(-10.5)
Altman Dummy 2	0.36	0.48	0.00	0.23	0.42	0.00	0.38	0.49	0.00	-0.16***	(-13.8)
Negative EBIT	0.07	0.26	0.00	0.07	0.25	0.00	0.07	0.26	0.00	-0.00	(-0.8)
Negative Net Income	0.15	0.36	0.00	0.12	0.32	0.00	0.16	0.36	0.00	-0.04***	(-4.8)

Table 3**Sample Distribution – Chapter 11 Filings**

This table displays the sample distribution of chapter 11 filings for our sample of 728 S&P 500 firms during the period from 1995 to 2019 as well as for the subsamples of family-owned and non-family-owned firms.

	Full Sample		Family Firms		Non-Family Firms	
	N	%	N	%	N	%
1996-2000	8	17.78	0	0.00	8	18.18
2001-2005	10	22.22	1	100.00	9	20.45
2006-2010	11	24.44	0	0.00	11	25.00
2011-2015	5	11.11	0	0.00	5	11.36
2016-2020	11	24.44	0	0.00	11	25.00
Total	45		1		44	

Table 4

Univariate Statistics – Family Firm Subsample

This table displays the univariate statistics of firm characteristics and distress variables for our subsample of family-owned firms during the period from 1995 to 2019. The overview shows the statistics for all family-owned firms and subsamples of founder-run and non-founder-run firms. The definition of founder-run is whether the founder holds the position of CEO or Chairman. The data is winsorized at the 1% level. The total assets variable is displayed in USD millions. The variables are described in detail in Appendix 1.

	Family Firm Subsample			Founder Run			Non-Founder Run			Difference of Mean	
	Mean	SD	Median	Mean (1)	SD	Median	Mean (2)	SD	Median	[(1)-(2)]	t-statistic
Panel A: Firm Variables											
Total Assets	11,431.95	29,137.07	3,132.12	14,278.86	35,453.55	2,994.17	9,157.09	22,628.03	3,167.75	5121.77***	(4.2)
Ebitda Margin	0.15	0.14	0.15	0.16	0.18	0.15	0.15	0.11	0.15	0.02***	(2.9)
Ebit Margin	0.10	0.16	0.11	0.11	0.20	0.11	0.10	0.12	0.11	0.01	(1.15)
Leverage	0.21	0.18	0.18	0.19	0.21	0.12	0.22	0.16	0.21	-0.03***	(-3.9)
ROA	0.11	0.09	0.11	0.12	0.11	0.12	0.11	0.08	0.11	0.01*	(1.7)
Cash Ratio	0.16	0.17	0.10	0.23	0.20	0.18	0.11	0.13	0.06	0.12***	(17.57)
Capex Ratio	0.06	0.05	0.04	0.06	0.06	0.05	0.05	0.04	0.04	0.01***	(5.1)
Working Capital Ratio	0.22	0.19	0.20	0.27	0.20	0.25	0.18	0.17	0.18	0.09***	(11.3)
Receivables Ratio	0.14	0.10	0.14	0.15	0.11	0.14	0.14	0.09	0.13	0.02***	(4.1)
Equity Ratio	0.48	0.21	0.47	0.51	0.24	0.52	0.46	0.19	0.45	0.05***	(8.6)
Equity Issuance Ratio	0.02	0.04	0.01	0.03	0.07	0.01	0.01	0.04	0.00	0.02***	(8.0)
Liquidity	2.25	1.47	1.86	2.58	1.73	2.01	1.99	1.16	1.77	0.58***	(9.4)
Interest Coverage	47.94	127.51	9.39	73.25	168.95	10.76	30.02	82.47	8.82	43.23***	(7.5)
Short-term debt Ratio	0.21	0.27	0.10	0.23	0.30	0.10	0.20	0.25	0.10	0.03*	(2.14)
Panel B: Distress Variables											
Altman Z Score	5.97	5.49	4.38	7.32	7.05	4.87	4.92	3.53	4.07	2.40***	(10.4)
Altman Z' Score	4.69	3.40	4.23	4.99	4.02	4.51	4.45	2.80	4.12	0.53***	(3.6)
Altman Dummy 1	0.07	0.25	0.00	0.10	0.30	0.00	0.05	0.21	0.00	0.05***	(4.5)
Altman Dummy 2	0.23	0.42	0.00	0.24	0.43	0.00	0.22	0.41	0.00	0.03	(1.4)
Negative EBIT	0.07	0.25	0.00	0.09	0.28	0.00	0.05	0.23	0.00	0.03***	(3.2)
Negative Net Income	0.12	0.32	0.00	0.14	0.35	0.00	0.10	0.30	0.00	0.05***	(3.5)

Table 5**Impact of Family Ownership on Distress Variables**

This table shows the panel linear and logit regression results of the effect of family-ownership on various distress variables. The dependent variable are the Altman Z' score, and the Altman 1 and Altman 2 dummy that take the value of 1 if the Altman Z' score is below 1.1 and 2.6, respectively. The explanatory variable takes the value of 1 if the members of the founding family hold more than 5 percent of the equity in the company. The variables are winsorized at the 1 percent level. The *, **, and *** represent statistical significance at the 10%, 5% and 1% levels, respectively. The variables are described in detail in Appendix 1

	Altman Z' Score	Altman Dummy 1		Altman Dummy 2	
	(1)	(2)	(3)		
	Coef.	Coef.	Odds	Coef.	Odds
FamFirm	0.44*** (4.95)	-1.22*** (-4.59)	0.29***	-0.89*** (-4.96)	0.36***
Employees	-0.00 (-1.51)	-0.01*** (-4.36)		0.00*** (5.15)	
PPENT Ratio	-1.85*** (-8.23)	1.90*** (3.67)		2.10*** (4.99)	
Leverage	-9.00*** (-65.80)	9.45*** (23.56)		10.82*** (29.95)	
Intercept	8.18*** (5.32)	-7.71*** (-8.97)		-4.52** (-2.21)	
Industry FE	Yes	Yes		Yes	
Year FE	Yes	Yes		Yes	
# of observations	12,174	12,153		12,153	

Table 6

Impact of Family Ownership on Liquidity, Capital Structure and Growth

This table shows the analysis of the panel linear regression results of the effect of family-ownership on various capital structure, liquidity and investment variables with two-way interaction effects. The data is winsorized at the 1 percent 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

	Cash	Equity	Equity Issuance	Short-term debt	Leverage	Financing Cashflows	Capex	Employee Growth
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FamFirm	0.01** (2.14)	0.02*** (5.57)	0.02 (0.12)	0.03*** (5.12)	-0.05*** (-11.61)	0.01*** (4.25)	0.01*** (7.34)	2.07** (2.39)
Altman Dummy 1	0.03*** (8.31)	-0.13*** (-31.72)	1.69*** (9.52)	0.04*** (5.37)	0.17*** (37.52)	0.02*** (6.60)	-0.00 (-1.34)	-2.68*** (-2.64)
FamFirm*Altman Dummy 1	0.09*** (7.74)	0.03** (2.39)	1.44*** (2.72)	0.02 (0.81)	0.05*** (3.79)	0.03*** (3.15)	0.01*** (4.34)	12.73*** (4.22)
Revenues	-0.00*** (-10.31)	-0.00*** (-22.94)	-0.00*** (-5.61)	0.00* (1.83)	-0.00*** (-5.69)	-0.00*** (-4.28)	-0.00*** (-4.24)	-0.00 (-1.48)
PPENT Ratio	-0.22*** (-29.91)	0.02** (2.19)	-3.56*** (-11.47)	-0.12*** (-10.10)	0.12*** (14.48)	-0.04*** (-6.75)	0.13*** (81.09)	-9.45*** (-5.28)
Leverage	-0.22*** (-28.04)	-0.89*** (-114.57)	-2.95*** (-8.65)	-0.31*** (-23.66)		0.07*** (12.25)	-0.03*** (-15.91)	-7.57*** (-3.88)
Intercept	0.16*** (5.19)	0.69*** (22.72)	5.39*** (4.10)	0.40*** (8.35)	0.12*** (3.29)	-0.03 (-1.48)	0.03*** (3.80)	13.28* (1.74)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
# of observations	12,264	12,267	11,818	11,455	12,267	12,261	12,217	11,684

Table 7**PSM Sample – Univariate Statistics**

This table displays the univariate statistics of firm characteristics for our PSM sample over the period from 1995 to 2019. The propensity score matching takes the subsample of non-family-owned companies that filed for chapter 11 and matches it with family-owned firms based on the Altman Z'' score and negative EBIT in the year prior to Chapter 11. The overview shows the statistics for the entire PSM sample and subsamples of non-family-owned chapter 11 firms and the family-owned non-chapter 11 firms. The variables are winsorized at the 1% level. The total assets variable is displayed in USD millions. The variables are described in detail in Appendix 1.

	PSM Sample			Chapter 11 subsample			Non-Chapter 11 subsample			Difference of Mean	
	Mean	SD	Median	Mean (1)	SD	Median	Mean (2)	SD	Median	[(1)-(2)]	t-statistic
Panel A: Firm Variables											
Total Assets	7,345.88	16,723.96	2,714.54	10,160.20	22,518.41	4,244.00	4,531.55	6,599.21	1,990.45	-5628.65*	(-1.72)
Ebitda Margin	-0.01	0.24	0.03	0.00	0.17	0.01	-0.02	0.29	0.05	-0.02***	(0.44)
Ebit Margin	-0.11	0.33	-0.01	-0.07	0.23	-0.02	-0.15	0.40	0.03	-0.08	(-1.24)
Capex Ratio	0.06	0.06	0.04	0.04	0.03	0.04	0.07	0.07	0.05	0.03***	(2.75)
Cash Ratio	0.17	0.19	0.08	0.09	0.08	0.08	0.24	0.23	0.13	0.14***	(4.17)
Working Capital Ratio	0.10	0.18	0.09	0.09	0.16	0.10	0.12	0.20	0.08	0.03	(0.91)
Receivables Ratio	0.13	0.11	0.13	0.11	0.06	0.11	0.16	0.14	0.14	0.05**	(2.24)
Equity Ratio	0.04	0.35	0.04	-0.08	0.29	-0.08	0.16	0.36	0.21	0.24***	(3.74)
Equity Issuance Ratio	0.03	0.07	0.00	0.01	0.03	0.00	0.05	0.09	0.01	0.05***	(3.27)
Liquidity Ratio	1.66	1.24	1.36	1.60	0.93	1.38	1.73	1.50	1.34	0.13	(1.11)
Interest Coverage Ratio	1.59	40.22	-0.07	-2.61	6.26	-0.91	6.48	58.63	0.68	9.09	(0.53)
Short-Term Debt Ratio	0.29	0.35	0.13	0.42	0.38	0.34	0.16	0.24	0.05	-0.26***	(-3.91)

Table 8

PSM Sample - Impact of Family Ownership on Cash and Equity Cushion

This table shows the panel linear regression results of the effect of family-ownership on several cash, equity and short-term debt variables. The dependent variables are cash & equivalents divided by total assets, total equity divided by total assets, equity issuance divided by total assets and short-term debt divided by total debt. The explanatory variable is a dummy variable that takes the value of 1 if the members of the founding family hold more than 5 percent of the equity in the company. Variables are winsorized at the 1 percent level. The *, **, and *** represent statistical significance at the 10%, 5% and 1% levels, respectively. The variables are described in detail in Appendix 1

	Cash Ratio	Equity Ratio	Equity Issuance Ratio	Short-term Debt Ratio
	(1)	(2)	(3)	(4)
FamFirm	0.13*** (3.25)	0.33*** (4.88)	4.57* (1.97)	-0.18** (-2.23)
Revenues	-0.00 (-0.79)	0.00 (0.96)	-0.00 (-0.08)	-0.00 (-0.48)
PPENT Ratio	-0.36*** (-4.64)	-0.11 (-0.82)	-6.80 (-1.46)	-0.25* (-1.73)
Leverage	-0.02 (-0.33)	-0.57*** (-5.84)	5.02 (1.43)	-0.33*** (-2.89)
Intercept	0.27*** (3.76)	0.16 (1.26)	7.49* (1.81)	0.85*** (6.22)
Industry FE	Yes	Yes	Yes	Yes
# of observations	103	103	98	97

Appendix 1

Variable Definitions

This table displays the definitions of the variables that are used in this paper.

Variable	Description
FamFirm	Dummy variable that has the value of 1 if the founding family (including descendants) owns at least 5% of the firm's equity, 0 otherwise
FamStake	Aggregate percentage of ownership of the founding family in the family-owned firm
CEO/Chairman Founder	Dummy variable that has the value of 1 if the founder is the CEO or chairman of the family firm, 0 otherwise
CEO/Chairman Family	Dummy variable that takes the value of 1 if a family member is the CEO or chairman of the family firm, 0 otherwise
Total Assets	Total assets of the firm in the respective year
Leverage	Ratio of total debt to total assets
ROA	Ratio of EBIT to total assets
Liquidity	Ratio of current assets to current liabilities
Interest Coverage	Ratio of EBIT to total interest
Altman Z Score	The Altman Z Score (Altman, 1969)
Altman Z'' Score	The Altman Z'' Score (Altman et al., 1995)
Altman Dummy 1	Dummy variable that has the value of 1 if the Altman Z'' score is below 1.1
Altman Dummy 2	Dummy variable that takes the value of 1 if the Altman Z'' score is below 2.6
Negative Ebit	Dummy variable that has the value of 1 if Ebit is negative
Negative Net Income	Dummy variable that takes the value of 1 if net income is negative
Revenues	Revenues in that respective year
Employees	Employees in that respective year
PPENT Ratio	Ratio of net property, plant and equipment to total assets
Chapter 11	Dummy variable that takes the value of 1 if the firm files for chapter 11
Cash Ratio	Ratio of cash and equivalents to total assets
Equity Ratio	Ratio of equity to total assets
Equity Issuance Ratio	Ratio of equity issuance to total assets (in percent)
Ebitda margin	Ratio of Ebitda to Revenues
Ebit margin	Ratio of Ebit to Revenues
Capex Ratio	Ratio of capital expenditure to total assets
Working Capital Ratio	Ratio of working capital to total assets
Receivables Ratio	Ratio of receivables to total assets
Financing Cashflow Ratio	Ratio of cashflow from financing activities to total assets
Short-term Debt Ratio	Ratio of short-term debt to total debt

Appendix 2

Distribution of Sample Firms by Industry

This table displays the sample distribution of 728 S&P 500 firms during the period from 1995 to 2019 with respect to the industry distribution for the full sample, for family-owned firms and for non-family-owned firms.

SIC Code	Type	Full Sample		Family Firms		Non-Family Firms	
		N	%	N	%	N	%
0	Agriculture	2	0.43	1	0.54	1	0.18
1	Mining, Oil & Gas	59	14.35	11	5.95	48	8.84
2	Construction	172	1.30	36	19.46	136	25.05
3	Manufacturing	229	42.17	47	25.41	182	33.52
4	Transportation	45	6.96	8	4.32	37	6.81
5	Wholesale Trade	89	4.35	30	16.22	59	10.87
7	Retail Trade	103	16.96	42	22.70	61	11.23
8	Finance, Insurance, RE	25	1.30	9	4.86	16	2.95
9	Services	4	12.17	1	0.54	3	0.55
	Total	728		185		543	

Appendix 3

Distribution of Firm-Years with distressed Altman Z'' score

This table displays the distribution of firm-years with a distressed Altman Z'' score for the sample of 728 S&P 500 firms during the period from 1995 to 2019.

Year	Family Firms		Non-Family Firms	
	N	%	N	%
1995	2	1.31	36	2.16
1996	1	0.65	38	2.29
1997	6	3.92	37	2.22
1998	8	5.23	54	3.25
1999	9	5.88	59	3.55
2000	6	3.92	58	3.49
2001	10	6.54	65	3.91
2002	14	9.15	73	4.39
2003	13	8.5	62	3.73
2004	9	5.88	55	3.31
2005	9	5.88	65	3.91
2006	8	5.23	61	3.67
2007	1	0.65	67	4.03
2008	5	3.27	76	4.57
2009	2	1.31	78	4.69
2010	3	1.96	66	3.97
2011	2	1.31	66	3.97
2012	1	0.65	72	4.33
2013	4	2.61	66	3.97
2014	3	1.96	68	4.09
2015	5	3.27	81	4.87
2016	6	3.92	83	4.99
2017	8	5.23	70	4.21
2018	5	3.27	68	4.09
2019	7	4.58	70	4.21
2020	6	3.92	69	4.15
Total	153		1663	

Appendix 4A

Impact of Family Ownership on Distress Variables – Robustness

This table shows the robustness tests for the panel linear and logit regression results of the effect of family-ownership on various distress variables. Panel A shows the regressions of Table 5 with the continuous family stake variable as the explanatory variable instead of the family dummy variable. Panel B replaces the Altman Z'' score as the dependent variable with the Altman Z score. The variables are winsorized at the 1 percent 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.

Panel A: Family Stake					
	Altman Z'' Score	Altman Dummy 1		Altman Dummy 2	
	(1)	(2)	(3)	(3)	(3)
	Coef.	Coef.	Odds	Coef.	Odds
Fam Stake	0.01*** (2.69)	-0.03** (-2.28)	0.97** (-2.28)	-0.02** (-2.07)	0.98** (-2.07)
Employees	-0.00** (-2.36)	-0.00*** (-3.62)		0.00*** (5.15)	
PPENT Ratio	-1.23*** (-5.77)	0.64 (1.34)		1.96*** (5.01)	
Leverage	-8.81*** (-67.80)	9.50*** (24.88)		10.67*** (30.93)	
Intercept	7.91*** (5.08)	-6.54*** (-8.42)		-4.27** (-2.11)	
Industry FE	Yes	Yes		Yes	
# of observations	12,174	12,113		12,153	

Panel B: Altman Z Score (instead of Z'' Score)					
	Altman Z Score	Altman Dummy 3		Altman Dummy 4	
	(1)	(2)	(3)	(3)	(3)
	Coef.	Coef.	Odds	Coef.	Odds
FamFirm	0.90*** (6.12)	-1.19*** (-4.78)	0.30*** (-4.78)	-1.01*** (-5.79)	0.36*** (-5.79)
Employees	-0.00*** (-7.29)	-0.00** (-2.04)		0.00*** (2.96)	
PPENT Ratio	0.66* (1.92)	0.41 (0.89)		-0.18 (-0.48)	
Leverage	-11.21*** (-49.17)	10.57*** (25.63)		10.57*** (31.35)	
Intercept	8.39*** (4.14)	-5.51* (-1.93)		-4.11 (-1.63)	
Industry FE	Yes	Yes		Yes	
Year FE	Yes	Yes		Yes	
# of observations	12,099	12,099		12,099	

Appendix 4B

Impact of Family Ownership on Distress Variables – Robustness

This table shows the robustness tests for the panel linear and logit regression results of the effect of family-ownership on various distress variables. Panel C shows the regressions of Table 5 for two subsamples based on above or below average firm size (total assets). The data is winsorized at the 1 percent 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

Panel C: Firm Size Subsamples										
	Big Firm Size Subsample					Small Firm Size Subsample				
	Altman Z" Score	Altman Dummy 1		Altman Dummy 2		Altman Z" Score	Altman Dummy 1		Altman Dummy 2	
	(1)	(2)		(3)		(4)	(5)		(6)	
	Coef.	Coef.	Odds	Coef.	Odds	Coef.	Coef.	Odds	Coef.	Odds
FamFirm	0.83*** (5.20)	-2.51*** (-3.25)	0.08*** (-3.25)	-2.38*** (-3.42)	0.09*** (-3.42)	0.35*** (-2.89)	0.42*** (-2.89)	0.29***	-0.68*** (-3.39)	0.51*** (-3.39)
Employees	-0.00** (-2.47)	-0.01*** (-4.73)		0.00*** (4.03)		-0.00 (-1.17)	-0.00 (-0.96)		0.01*** (3.77)	
PPENT Ratio	0.11 (0.34)	0.40 (0.30)		-0.81 (-0.75)		-2.46*** (-9.25)	2.96*** (4.91)		3.10*** (6.39)	
Leverage	-5.50*** (-23.81)	14.34*** (9.91)		15.14*** (12.37)		-9.60*** (-60.30)	9.54*** (20.95)		10.76*** (26.75)	
Intercept	5.44*** (3.10)	-7.18*** (-3.30)		-3.82 (-0.96)		7.99*** (5.03)	- (-9.26)	8.78***	-4.76** (-2.05)	
Industry FE	Yes	Yes		Yes		Yes	Yes		Yes	
Year FE	Yes	Yes		Yes		Yes	Yes		Yes	
#observations	2,769	2,735		2,759		9,405	9,378		9,394	

Appendix 5A

Impact of Family Ownership on Liquidity, Capital Structure and Growth - Robustness

This table shows the panel linear regression results of the effect of family-ownership on several cash and equity variables. The dependent variables are cash & equivalents divided by total assets, total equity divided by total assets and equity issuance divided by total assets. The explanatory variable is a dummy variable that takes the value of 1 if the members of the founding family hold more than 5 percent of the equity in the company. Variables are winsorized at the 1 percent 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: Cash		Cash Ratio		
	Full Sample	Distress Subsample	Non-Distress Subsample	
	(1)	(2)	(3)	
FamFirm	0.01*** (3.75)	0.11*** (8.00)	0.00 (1.04)	
Revenues	-0.00*** (-9.75)	-0.00*** (-6.52)	-0.00*** (-8.23)	
PPENT Ratio	-0.20*** (-29.79)	-0.25*** (-13.11)	-0.20*** (-26.08)	
Leverage	-0.19*** (-26.57)	-0.05*** (-3.11)	-0.29*** (-32.59)	
Intercept	0.15*** (4.74)	0.23*** (7.22)	0.17*** (5.63)	
Industry FE	Yes	Yes	Yes	
# of observations	12,656	1,713	10,551	

Panel B: Equity Issuance		Equity Issuance Ratio		
	Full Sample	Distress Subsample	Non-Distress Subsample	
	(1)	(2)	(3)	
FamFirm	-0.03 (-0.23)	1.60** (2.10)	-0.08 (-0.62)	
Revenues	-0.00*** (-6.37)	-0.00*** (-2.79)	-0.00*** (-4.64)	
PPENT Ratio	-3.02*** (-10.27)	-6.56*** (-5.93)	-2.81*** (-9.13)	
Leverage	-1.81*** (-5.85)	0.25 (0.25)	-4.12*** (-11.56)	
Intercept	5.13*** (3.90)	7.08*** (3.85)	5.54*** (4.70)	
Industry FE	Yes	Yes	Yes	
# of observations	12,190	1,658	10,160	

Panel C: Equity		Equity Ratio		
	Full Sample	Distress Subsample	Non-Distress Subsample	
	(1)	(2)	(3)	
FamFirm	0.03*** (9.78)	0.06*** (3.80)	0.02*** (5.02)	
Revenues	-0.00*** (-20.19)	-0.00*** (-4.18)	-0.00*** (-23.20)	
PPENT Ratio	-0.00 (-0.02)	0.02 (0.97)	0.01* (1.85)	
Leverage	-0.96*** (-130.82)	-0.77*** (-35.18)	-0.93*** (-113.29)	
Intercept	0.70*** (22.27)	0.53*** (13.46)	0.70*** (25.42)	
Industry FE	Yes	Yes	Yes	
# of observations	12,687	1,716	10,551	

Appendix 5B

Impact of Family Ownership on Liquidity, Capital Structure and Growth - Robustness

This table shows the panel linear regression results of the effect of family-ownership on several cash and equity variables. The dependent variables are short term debt divided by total debt, total debt divided by total assets and cashflows from financing activities divided by total assets. The explanatory variable is a dummy variable that takes the value of 1 if the members of the founding family hold more than 5 percent of the equity in the company. Variables are winsorized at the 1 percent level. Statistical significance at the 10%, 5% and 1% levels indicated as *, **, and ***, respectively. The variables are described in detail in Appendix 1

Panel D: Short-Term Debt			
	Short-term debt Ratio		
	Full Sample	Distress Subsample	Non-Distress Subsample
	(1)	(2)	(3)
FamFirm	0.03*** (5.58)	0.05*** (2.69)	0.03*** (4.75)
Revenues	0.00*** (4.69)	-0.00 (-0.81)	0.00** (2.48)
PPENT Ratio	-0.13*** (-12.19)	-0.07*** (-2.70)	-0.13*** (-10.06)
Leverage	-0.25*** (-21.01)	-0.24*** (-9.62)	-0.34*** (-21.95)
Intercept	0.40*** (8.25)	0.27*** (6.25)	0.41*** (8.51)
Industry FE	Yes	Yes	Yes
# of observations	11,865	1,657	9,798

Panel E: Leverage			
	Leverage Ratio		
	Full Sample	Distress Subsample	Non-Distress Subsample
	(1)	(2)	(3)
FamFirm	-0.05*** (-12.59)	0.02 (0.95)	-0.05*** (-12.36)
Revenues	-0.00 (-1.13)	-0.00*** (-5.78)	-0.00*** (-3.83)
PPENT Ratio	0.11*** (13.50)	0.22*** (8.39)	0.10*** (12.03)
Intercept	0.11*** (2.94)	0.17*** (3.88)	0.12*** (3.75)
Industry FE	Yes	Yes	Yes
# of observations	12,687	1,716	10,551

Panel F: Cash Flow from Financing Activities			
	Financing Cashflows Ratio		
	Full Sample	Distress Subsample	Non-Distress Subsample
	(1)	(2)	(3)
FamFirm	0.01*** (4.38)	0.04*** (4.14)	0.01*** (4.44)
Revenues	-0.00*** (-4.25)	-0.00 (-0.52)	-0.00*** (-3.95)
PPENT Ratio	-0.03*** (-5.98)	-0.02 (-1.44)	-0.04*** (-6.27)
Leverage	0.09*** (16.71)	0.04*** (4.14)	0.09*** (13.39)
Intercept	-0.04* (-1.66)	0.02 (0.92)	-0.03 (-1.50)
Industry FE	Yes	Yes	Yes
# of observations	12,652	1,714	10,547

Appendix 5C

Impact of Family Ownership on Liquidity, Capital Structure and Growth - Robustness

This table shows the panel linear regression results of the effect of family-ownership on several cash and equity variables. The dependent variable is the ratio of capex to total assets. The explanatory variable is a dummy variable that takes the value of 1 if the members of the founding family hold more than 5 percent of the equity in the company. Variables are winsorized at the 1 percent level. Statistical significance at the 10%, 5% and 1% levels indicated as *, **, and ***, respectively. The variables are described in detail in Appendix 1

	Capex Ratio		
	Full Sample	Distress Subsample	Non-Distress Subsample
	(1)	(2)	(3)
FamFirm	0.01*** (8.11)	0.02*** (5.34)	0.01*** (7.17)
Revenues	-0.00*** (-2.96)	0.00 (0.26)	-0.00*** (-4.75)
PPENT Ratio	0.14*** (87.59)	0.11*** (22.61)	0.14*** (80.56)
Leverage	-0.03*** (-17.04)	-0.00 (-0.42)	-0.04*** (-19.20)
Intercept	0.01*** (1.25)	0.04*** (4.56)	0.03*** (4.24)
Industry FE	Yes	Yes	Yes
# of observations	12,602	1,709	10,509