Corporate hedging, family firms, and CEO identity

Corporate hedging, family firms, and CEO identity*

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Abstract

We study the propensity to hedge of closely-held family-managed firms. Family involvement in CEO positions positively affects the likelihood of hedging. The effect is stronger when the CEO belongs to the founding family, especially for long-tenured and founder CEOs. This evidence is consistent with the higher conservatism of family agents, aimed at protecting socioemotional wealth and avoiding loss of reputation and control. Information asymmetry and, more mildly, underdiversification increase the propensity to hedge. Corporate governance attributes proxying agency issues are not significant.

JEL Classification: G30; G32; G34.

Keywords: Family firms; Family generation; Founder CEO; CEO tenure; Hedging.

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1. Introduction

Hedging policies are of paramount importance in corporate finance. Global surveys (Giambona et al., 2018) and single-country surveys (Bodnar et al., 1998, for the US; Mallin et al., 2001, for the UK; Bodnar et al., 2013, for Italy; among the others) report that the vast majority of non-financial firms hedge against the volatility of market variables to reduce its adverse effects on the firm's future cash flows. A large body of research has investigated the theoretical reasons for why firms should hedge (see Smith, 2008, for a review). Several empirical studies have tested such theoretical predictions (Bessler et al., 2019, and Geyer-Klingeberg et al., 2021, provide comprehensive coverage of these works). However, the empirical literature on hedging has mostly focused on corporate environments characterized by dispersed ownership. With few exceptions (e.g., Kim et al., 2014), the investigation of hedging at the level of closely-held family-dominated firms is sparse, mainly due to data limitations. Closely-held firms are expected to deviate from the hedging policy adopted by otherwise comparable diffusely-held firms. In this article, we contribute to the literature on the determinants of hedging in closely-held family firms. We first explore how a firm's "familiness" affects its hedging decisions, analyzing the role of a family CEO, their generation, and their tenure. Second, we elaborate on the possible channels through which family firms and CEO identity affect hedging decisions.

The typical corporate environment of continental European listed firms is characterized by a highly concentrated ownership, with a family being the majority shareholder in most cases (Faccio and Lang, 2002; Barontini and Caprio, 2006). According to a study on corporate control around the world (Aminadav and Papaioannou, 2020), covering 127 countries over the period 2004-2012, family-controlled firms are on average 52% of all listed firms in Germany, 54% in France, 59% in Italy, 32% in Spain, and 32% in the Netherlands, just mentioning the first five continental European countries by GDP. As this evidence suggests, family firms are pervasive in Italy. A recent paper by Bajo et al. (2020) shows that the average first shareholder held a 48% equity stake in Italy over the period 2014-2018. Also, family-controlled firms represent 65% of all listed firms. The annual report on corporate governance elaborated by the Italian financial markets regulator (*Commissione Nazionale per le Società e la Borsa*, CONSOB) suggests that the

average stake of the first shareholder has remained virtually unchanged in the last 20 years (in 1998 it was 49%), and the share of listed firms controlled by a family has even increased in recent years.

Hedging at closely-held family firms departs from the theoretical predictions based on dispersed ownership. First, families are more risk-averse than other shareholders (Anderson and Reeb, 2003; Hiebl, 2013). Families are long-term investors, and their long-term orientation is aimed at assuring firm survival and protecting reputation and socioemotional wealth (Miller and Le Breton-Miller, 2005; Gómez-Mejía et al., 2007; Zellweger et al., 2012; Hoskisson et al., 2017). The higher conservatism also comes from the controlling family holding an underdiversified portfolio, as the equity stake in the firm represents a significant portion of their wealth (Anderson and Reeb, 2003; Bianco et al., 2013; Kim et al., 2014; Boubaker et al., 2016). Second, family firms are more informationally opaque (Anderson et al., 2009), making outside financing more expensive (Boubakri and Ghouma, 2010; Lin et al., 2011). Third, controlling families wish to retain control, pass it on to their heirs, and likely realize wealth extractions (Anderson et al., 2009; Keasey et al., 2015; Bajo et al., 2020). Consequently, family firms should be more inclined to manage the risk of unanticipated market events that would increase the likelihood of sizeable cash outflows.

Like investment and financing decisions, a firm's hedging policy results from the top management's orientation (Hambrick and Mason, 1984). It is well-documented that family-controlled firms run by a family CEO exhibit even more cautious behavior when considering entrepreneurial risk-taking (George et al., 2005; Gómez-Mejía et al., 2010; Huybrechts et al., 2013; Gentry et al., 2016; Lardon et al., 2017). This conservatism is intensified by the family CEO's identity, as both the CEO affiliation to the founding family and its generation play a crucial role (Amore et al., 2011; Cirillo et al., 2019; Abebe et al., 2020). Accordingly, the effect of family status on a firm's hedging policy is expected to be stronger when the CEO is a family member rather than an outside professional, as their actions directly reflect the controlling family's orientation. Also, belonging to the founding family, or being the firm's founder, further increases the extent to which the CEO's values are identified and overlap with those of the firm and the other family members. This, in turn, leads family CEOs to be more concerned with the long-term well-being of

the firm (and family) and engage in corporate strategies in line with such concern (Abebe et al., 2020).

In this article, we explore the association between hedging and the firm's family status. Then, within family firms, we study the propensity to hedge of firms led by a family CEO against an outside professional CEO, and the role of a CEO's generation. We contrast the hedging decisions of CEOs belonging to the founding family to those made by non-founding family CEOs and, within firms managed by a founding family CEO, we disentangle the effect of a founder CEO relative to an heir CEO. We employ a sample composed of the universe of Italian non-financial listed firms over a 10-year period (2009-2018). A country like Italy, with high ownership concentration and significant involvement of families, is fit for our purpose (Faccio and Lang, 2002; Aminadav and Papaioannou, 2020).

We report that family involvement in top-management positions significantly increases a firm's likelihood of hedging. Compared to an outside professional CEO (and non-family firms), a family CEO increases the likelihood of hedging by 12 percentage points. This effect is stronger in family firms led by a CEO belonging to the founding family. A founding family CEO increases the likelihood of hedging by 17 percentage points, relative to family firms not managed by a founding family member (and non-family firms). When we inspect the role of the founding family CEO's generation, we find a prominent role of the founder. A founder CEO (heir CEO) significantly increases the likelihood of hedging by 23 (14) percentage points. Finally, a CEO's tenure impacts the link between family CEO and propensity to hedge, as family (and founder) CEOs are more likely to hedge when they have been at the helm for a long while.

This evidence supports the higher conservatism of family agents who wish to protect socioemotional wealth and avoid loss of reputation and control. Moreover, we identify additional channels through which family firms and family CEOs may affect firm hedging, namely underdiversification, greater information asymmetry, and a higher likelihood of wealth extraction. Underdiversified family owners should be more conservative and hedge more since they have a large portion of their wealth invested in the firm. Family-managed firms are more opaque to the market and suffer from higher information asymmetry, making outside financing costlier. Hedging reduces the likelihood of adverse fluctuations in future operating cash flows,

which would force the firm to raise expensive external capital. Finally, hedging could result from non-value maximizing firm's decisions in a weak corporate governance environment. In family-controlled firms, hedging may be used to favor the largest shareholders, allowing them to extract private benefits and preserve control. Therefore, a higher likelihood of hedging is expected in family-managed firms with weak corporate governance attributes. We empirically investigate whether these three channels contribute to our results. We report that higher information asymmetry and, more weakly, underdiversification significantly increase the propensity for hedging of family and family-managed firms. Corporate governance attributes proxying potential wealth extractions, on the other hand, seem less important. Indeed, while hedging family firms show lower cash flow variability, they are worth the same as non-hedging family firms.

Our evidence survives several robustness exercises. We repeat our analysis for the subsample of family firms and excluding the largest firms in our sample. We employ non-linear models rather than a linear probability model, as in the main analysis. We consider the potential endogeneity of family ownership in explaining hedging, and the endogenous selection between firms and CEOs. We alleviate such endogeneity concerns in three ways. We first use propensity score matching techniques to isolate the effect of family ownership and family CEO's identity from that of observable confounders on the hedging decision. Second, we investigate how a change of family status and CEO's identity impact a change in the firm's hedging policy, hence controlling for unobserved non-time varying firm characteristics correlated with hedging. Third, we limit our analysis to the subsample of firms that underwent a transition in the family CEO status within our sample period, hence avoiding the overlap between firm and CEO identity attributes and controlling for the influence of unobserved firm characteristics on hedging. Our results are robust to these exercises.

Our paper complements the study of Kim et al. (2014), who analyze the value impact of hedging on family and non-family-owned firms, using S&P 500 non-financial firms from 1992 to 1999. They report that hedging is beneficial for non-family firms, and value-neutral for family firms, supporting the notion that underdiversification of family shareholders leads family firms to make suboptimal hedging decisions. Our study adds to the understanding of how a firm's

"familiness" impacts hedging and, more broadly, strategic risk-taking and extends the existing literature in several regards.

First, we investigate hedging decisions by listed firms in Italy, a country characterized by high ownership concentration and significant involvement of families. Family ownership is not uncommon in the US, with founding families being present in one-third of industrial S&P 500 firms and holding an average equity stake of about 18% (Anderson and Reeb, 2004; Kim et al., 2014). However, their pervasiveness and concentration are not comparable with continental Europe, particularly Italy. For example, 70% of the firms in our sample are family-controlled, with an average equity stake of 56%. This means that Italy is an ideal empirical setting to test the hedging incentives of family firms.

Second, in addition to the analysis of family ownership, we also investigate how a firm's "familiness" affects hedging. Family firms are not a homogeneous category (Cirillo et al., 2019). Accordingly, we make a distinction between family firms managed by a family CEO and family firms run by an outside professional CEO, and we study the effect of the founding family CEO and their generation (i.e., whether the CEO is the firm's founder or a founder's heir).

Third, we use a rich set of explanatory variables at the CEO level, including age, gender, tenure, education, and experience, since corporate decisions depend on the identity of the controlling shareholder, but are implemented by the firm's top management (e.g., Bertrand and Schoar, 2003). CEO tenure is especially relevant since long-tenured family and founder CEOs are more conservative and more likely to hedge.

We organize our paper as follows. The following section develops a theoretical framework and presents our testable hypotheses. In Section 3, we describe our data and present our methodology. In Section 4, we discuss our main findings. Section 5 reports several robustness exercises to confirm the main results and support causality. Finally, Section 6 concludes the study.

2. Theoretical framework

There is global evidence that non-financial firms extensively hedge corporate exposures, and why firms do so is a widely investigated area of research (Giambona et al., 2018; Bodnar et

al., 2019). Early contributions show that hedging reduces the expected costs of financial distress (Smith and Stulz, 1985), lowers expected taxes if the firm's tax schedule is convex (Smith and Stulz, 1985), increases debt capacity and mitigates the costs of external financing (Froot et al., 1993), and makes debt overhang and underinvestment problems less likely (Myers, 1977; Froot et al., 1993). Hedging also has agency implications. According to Tufano (1998), hedging reduces the agency costs of managerial discretion on a firm's cash flows. DeMarzo and Duffie (1995) contend that hedging lowers the volatility of a firm's market value and helps shareholders better assess the abilities of the firm's management. On the other hand, the strength of corporate governance is a significant determinant of a firm's hedging. In a cross-country setting, Lel (2012) and Allayannis et al. (2012) suggest that firms with weaker monitoring devices and high agency costs hedge mostly for managerial reasons.

A firm's propensity to hedge may descend from its ownership structure. For a widely-held firm, hedging at the firm level only works on reducing non-systematic risk. Hedging at closely-held firms follows a different logic. Underdiversified owners are more likely to hedge to reduce non-systematic risk (Mayers and Smith, 1990; Tufano, 1996). Family firms are a relevant example of closely-held firms, and controlling families are prominent undiversified shareholders. Family firms are different from their non-family counterparts in many regards, and these differences are expected to shape their hedging policy.

First, families are more risk-averse than other shareholders (Anderson and Reeb, 2003; Hiebl, 2013). Families have a long-term orientation aimed at firm survival and a successful intergenerational transition (Miller and Le Breton-Miller, 2005). The higher conservatism of family firms is also related to the desire of the family to preserve non-financial socioemotional value, i.e., the stock of affect-related value impounded into the firm (Gómez-Mejía et al., 2007). Moreover, families wish to preserve credibility and trustworthiness in the marketplace, and their reputation could be impaired should bankruptcy occur (Miller and Le Breton-Miller, 2005). From a financial point of view, higher conservatism also comes from the controlling family holding an undiversified portfolio composed of a large equity stake in the firm. This investment usually represents a significant portion of a family's wealth (Bianco et al., 2013; Kim et al., 2014; Boubaker

et al., 2016).[1] The empirical evidence shows that family firms pursue a less aggressive investment activity, including research and development (Faccio et al., 2011; Croci et al., 2011; Anderson et al., 2012) and acquisitions (Gómez-Mejía et al., 2010), and have a less debt-oriented capital structure, since excessive leverage may endanger the firm's survival (Anderson et al., 2012; Schmid, 2013). Recently, Caprio et al. (2020) report that precautionary motives lead family firms to hold more cash than non-family firms.

Second, family firms often rely on unique abilities, motivations, and interpersonal connections of family members, undisclosed to outsiders, and difficult to imitate. The downside is the greater information asymmetry of family firms (Anderson et al., 2009; Bianco et al., 2013). Information asymmetry is particularly severe when family firms are managed by family members and when they have been at the head of the company for years (Caprio et al., 2020). Family members are more inclined towards autonomous decision-making and less willing to voluntarily disclose information (Chrisman et al. 2003; Chen et al., 2008; Anderson et al., 2009). This opacity may lead to opportunistic behavior and, in turn, a higher risk premium and more expensive outside financing. Consistent with this hypothesis, Boubakri and Ghouma (2010) find greater bond yield-spreads in family-controlled firms, while Lin et al. (2011) report that family firms face higher loan spreads. Evidence shows that family firms also bear a higher cost of equity. This has especially been the case for a sample of 566 firms from eight East Asian countries since the 1997-1998 Asian financial crisis (Boubakri et al., 2010). The implication is that family firms should reduce the likelihood of significant unexpected cash outflows that would force them to raise external funds.

Third, controlling families wish to retain control (Keasey et al., 2015), pass it on to heirs, and likely realize wealth extractions. Bajo et al. (2020) show that bolstering family control is the main reason for Italian family firms to adopt loyalty shares, a control-enhancing mechanism. Wealth extractions are more likely to occur within family-owned firms (Anderson et al., 2009), and higher involvement of family members on board increases the likelihood of the controlling

[1] Anderson and Reeb (2003) use the families that appear in both Forbes's 400 Wealthiest Americans survey and in the S&P 500 and find that families typically have over 69% of their wealth invested in the firm. Given the higher ownership concentration, it is reasonable to believe that this figure is even higher for Italian families.

family extracting private benefits (Barontini and Bozzi, 2011). From this perspective, hedging strategies could benefit the controlling shareholder in family firms with weak corporate governance. Since controlling families are reluctant to dilute their stake, family firms tend to finance their investment projects through internally generated funds and debt, avoiding new equity issuance. King and Santor (2008) and Croci et al. (2011), among others, find support for the control hypothesis and report a higher debt reliance in family firms. Likewise, Vandemaele and Vancauteren (2015) show that family firms have lower dividend payouts, consistent with a preference for internal financing. Consequently, family firms may be more inclined to hedge to preserve their future debt capacity.

Following this discussion, we present our first testable hypothesis.

H1: Family firms are more likely to hedge than non-family firms.

A firm's hedging strategy can be affected by the identity of its major shareholders, but it is operated by the firm's top management (Hambrick and Mason, 1984). Managerial characteristics are critical determinants of a firm's strategy and can partially predict organizational outcomes (Bertrand and Schoar, 2003). Under this perspective, family firms are heterogeneous, and their hedging decisions may depend on the CEO's identity. Family shareholders' preferences and orientation should directly affect a firm's strategy when such shareholders maintain an active management role (Amore et al., 2011; Anderson et al., 2012).

The existing literature analyzing how a CEO's identity affects a firm's strategy in family firms contrasts family CEOs to outside professional CEOs, and also shows that for founding family CEOs, their generation plays a crucial role (Amore et al., 2011; Cirillo et al., 2019; Abebe et al., 2020). According to the behavioral agency theory (Hoskisson et al., 2017), family CEOs make decisions designed to protect their socioemotional wealth impounded within the firm. Family CEOs behave less aggressively when pursuing strategies that increase a firm's internationalization (George et al., 2005). From a cognitive perspective, family CEOs have limited exposure to the external environment, as most of their professional experience lies within the family business. This may trigger cognitive rigidity, restrict the ability to conceive new opportunities, and foster

the preservation of the *status quo* (Zona, 2016). Therefore, a family CEO might intensify a family firm's conservative behavior and reduce entrepreneurial risk-taking (Huybrechts et al., 2013; Gentry et al., 2016; Lardon et al., 2017).

This leads to our second testable hypothesis.

H2: Family firms managed by a family CEO are more likely to hedge than professionally-managed family firms, and non-family firms.

When a family member holds the helm, their generation plays a decisive role (Miller et al., 2007, 2011; Fahlenbrach, 2009; Block, 2012). Family business literature shows that the family's attachment to the organization is highest when the controlling shareholder is the founding family and the firm is managed by the founder. This attachment tends to weaken as the firm transits into subsequent generations (Gómez-Mejía et al., 2007). Affection, self-identification with the firm, and socioemotional wealth are stronger in founder-led firms and fade as the firm moves into later stages, i.e., when ownership and management are in the hands of the heirs and, eventually, non-founding-family members and professional managers. Accordingly, founding family CEOs may exhibit more limited risk-taking, as highly volatile investment cash flows might jeopardize financial and personal well-being, family control, family relationships, family name, and family reputation (Naldi et al., 2007; Cirillo et al., 2019). Our third testable hypothesis is as follows.

H3a: The propensity to hedge of family firms managed by a family CEO is progressively higher for firms led by a founding family CEO, and founder-led firms.

Another stream of literature focuses on the entrepreneurial spirit of the founder. There is evidence of founder-led firms pursuing more growth-oriented strategies and "aggressive" corporate actions than their non-founder-led counterparts (Le Breton-Miller and Miller, 2008; Fahlenbrach, 2009; Miller et al., 2011). We, therefore, present an alternative hypothesis.

H3b: The propensity to hedge of family firms managed by a family CEO is lower in founder-managed firms than heir-led firms.

A CEO's risk-taking is impacted by their tenure. The propensity to engage in risky strategies increases in the early stages of a CEO's tenure and tends to decline over time (e.g., Souder et al., 2012; Boling et al., 2016; Cirillo et al., 2019). Short-tenured CEOs may be willing to prove their ability to handle highly uncertain activities. In contrast, long-tenured CEOs wish to preserve the *status quo* and follow strategies supporting their consolidated beliefs. This effect is more pronounced for founder-managed family firms. In such firms, the risk attitude of CEOs peaks at the beginning of their tenure and monotonically declines afterward (Souder et al., 2012; Cirillo et al., 2019). A long-tenured founder's conservative behavior aims at preserving family control, and organizational inertia prevails over entrepreneurial spirit. Also, long-tenured founders generally oppose delegating power, as required once a firm's complexity increases. Therefore, founders tend to curb high-growth risky initiatives, which would dilute their influence (Souder et al., 2012). Hence, our last hypothesis follows.

H4: Family firms managed by a family CEO are more likely to hedge when they are led by a longer-tenured CEO.

Overall, theoretical and empirical literature shows a lively and ongoing debate on how a firm's "familiness" affects risk-taking.

3. Data and methodology

3.1 Data

Our initial sample starts with the universe of Italian non-financial firms listed on the main market segment at the Italian stock exchange (*Borsa Italiana*) from 2009 to 2018. The source of information is the end-of-year directory of listed firms available in the historical statistics section of the *Borsa Italiana* website. We exclude financial firms as they are both users and providers of financial products, and it is hardly possible to distinguish between instruments used for hedging and trading activities (Spanò, 2007; Boubaker et al., 2020). On the other hand, it is well documented that non-financial firms mainly use financial derivatives for hedging, rather than for

speculation (Bartram, 2019). We focus on exchange rate risk since it is a relevant risk factor Italian non-financial firms face (Bodnar et al., 2013).[2] Italian firms are heavily involved in import-export activities and foreign direct investments, especially medium- and large-sized firms (as those in our sample). According to the 2020 annual survey on foreign trade and international activities provided by ISTAT (Italian Statistics Agency) and ICE (Italian Trade Agency),[3] about 46% of medium-sized companies (between 100 and 499 employees) and more than 50% of large firms (500 or more employees) are exporting firms. The incidence of importing firms is even higher. Hence, hedging exchange rate risk is a crucial strategic decision for Italian firms.

We manually collect each firm's annual report, for a total of 1,732 (firm-year) reports (i.e., our initial sample is composed of 173 firms per year, on average).[4] Since 2005, Italian listed firms must disclose information on market risk and how it is hedged through financial derivatives in compliance with the international reporting standards (IAS 32 and IFRS 7). The "materiality" requested by the accounting principles to disclose risk information reassures about the relevance of the exposure. We look at the explanatory notes of the annual reports for each firm in search of relevant risk, and we exclude firms stating that risk exposure is not present. We are left with a sample of 1,026 firm-year observations. When a material risk is present, we record the firm's hedging decision.[5] However, we are not able to quantitatively measure the size of the hedging

[2] Interest rate risk is also a relevant marketable risk (Bodnar et al., 2013). However, studying interest rate risk shows some critical points. As we will report later in this section, we can only detect the presence or not of a relevant risk as declared in the firm's annual statement. Interest rate risk can be more easily managed than exchange rate risk, simply by ex-ante preferring fixed-rate indebtedness, or choosing to renegotiate an adjustable-rate product after its inception. In these cases, the firm will declare no material interest rate risk and, as a consequence, we would record no interest rate risk (and no hedging). Also, for about two-thirds of our sample period (i.e., from 2012 to 2018), the Euribor rate (at which most adjustable-rate products are indexed in Italy and in the Eurozone) was zero or negative, with very low variability over time. The expectation of long-lasting zero or negative base rates made hedging interest rate risk a less critical decision than hedging foreign exchange risk for Italian firms.

[3] The annual survey, in Italian, is available at: http://www.annuarioistatice.it/.

[4] The sample is representative of the total number of listed firms in Italy. Excluding financial firms, *Borsa Italiana* reports 219 listed firms in the main market segment at the end of 2009, 190 firms at the end of 2018, and an average number of 197 firms in the decade 2009-2018. The average annual number of firms in our starting sample is slightly lower (173), as in some cases we are unable to find historical annual reports. This especially occurs for firms that are no longer listed, and therefore are private firms (or no longer active) at the time of data collection.

[5] We also followed Graham and Rogers (2002), and we looked at the presence of either international sales, international assets, or foreign exchange income, which would proxy the presence of foreign exchange risk. Starting from the initial sample (1,732 firm-year observations), we are left with 1,379 firm-year observations for which either of the three abovementioned variables is non-missing in Refinitiv Eikon, and with 946 firm-year observations for which either of the three variables is non-zero. This would make our sample smaller. Therefore, we prefer to

position (e.g., relative to the firm's size or total assets), as this information is seldom provided. Hence, we create a binary variable for the hedging decision. This variable takes the value of 1 when the firm discloses a material risk hedging and 0 otherwise.[6] We recognize that the inability to construct a variable for the extent of hedging (e.g., the percentage of a firm's foreign sales that is hedged) is a limitation of our study. However, it depends on the quantity and quality of hedging information publicly disclosed by Italian firms.

We associate hedging decisions to variables at the firm and CEO levels. We get ownership data from the Italian market regulator's (CONSOB) website. We categorize firms as family-controlled if an individual or a family is the largest shareholder, based on a threshold of 20% of the voting capital (Faccio and Lang, 2002; Aminadav and Papaioannou, 2020).[7] We collect CEOs' characteristics from their biographical sketch in Bureau Van Dijk AIDA and Refinitiv Eikon. We manually complement them by checking a CEO's publicly available resume and LinkedIn profile. For each CEO, we collect detailed information on their name, gender, birth year, education level and field, and previous work experience.

We augment our dataset with data on the composition of the board of directors from the annual "Report on corporate governance and ownership structures," available from the Italian stock exchange website.[8] We gather stock price, volume, bid-ask spread, and analyst coverage from Refinitiv Eikon and Datastream. Control variables at the firm level are also drawn from Refinitiv Eikon (Datastream/Worldscope). After collating our final dataset, 851 firm-year

rely on firm's discloses of a material foreign exchange risk in the annual reports. We wish to thank an anonymous reviewer for suggesting this check.

[6] Disclosure of market risks is rarely reported in tabular form. Therefore, we are also not able to analytically record the financial instruments used for this purpose. Consistent with the survey evidence provided by Bodnar et al. (2013) for Italy, we report that most hedging strategies involve linear structures (i.e., spot and cash positions, forward contracts, and cross-currency swaps). Only one-fourth of the hedgers in our sample (i.e., 166 firm-year observations out of 633) use non-linear structures (i.e., plain-vanilla options and their combinations).

[7] All results in our paper are qualitatively similar if we use a 10% threshold to classify family firms (Faccio and Lang, 2002; Barontini and Caprio, 2006). As we will show later in the paper (Table 4), the average equity capital of the first shareholder for family firms in our sample is 56%. The first decile (unreported) is 33%.

[8] Listed firms are required to prepare corporate governance reports in accordance with the Consolidated Law on Finance (Legislative Decree no. 58/1998). This document includes information on the independence of directors, as well as their election from a list presented by majority or minority shareholders (slate voting was introduced in Italy in 2005).

observations remain, belonging to 130 unique firms from 2009 to 2018. This is the sample we use for our empirical investigation.

3.2 Methodology

To test our first hypothesis, we regress the hedging dummy as our dependent variable on a firm's family status and a vector of control variables explaining the hedging decision. For our second and third hypotheses, we explore the role of a family CEO's identity. Following our previous theoretical discussion, within the subsample of family firms, we discriminate those managed by a CEO belonging to the controlling family (*Family CEO*) from firms run by an outside professional CEO (*Non-family CEO*). As family CEOs are not a homogeneous category (Cirillo et al., 2019), we further refine our analysis.

First, we look at the role of the family CEO when they belong to the founding family (*Family CEO, founding family*). Second, within family firms managed by a founding family CEO, we isolate the incremental effect of the founder (*Founder CEO*) relative to that of an heir (*Heir CEO*). Family ties are identified by online searches of the firm's historical profile and family trees. Concerning our last hypothesis, we explore the role of a CEO's tenure, calculated as the difference between the current year and the year the CEO was appointed. In our multivariate analysis, we interact family CEO variables with *CEO high tenure*, a dummy variable taking the value of 1 if the CEO has been in charge for more than the median tenure in our sample (6 years), to ease the interpretation of interacted coefficients.

We use a rich set of variables at the CEO level. There is an established literature on the relationship between CEO personal traits and risk-taking. Our controls at the CEO level include age, gender, education, and past professional experience. Evidence shows that younger CEOs pursue more aggressive investment strategies, have higher acquisition and takeover propensity, and use more leverage (Yim, 2013; Serfling, 2014). Croci et al. (2017) find that the likelihood of hedging increases with CEO age. We include the (log of the) age of the CEO (*Log CEO age*) to control for this effect. It is accepted that women are more risk-averse than males, suggesting that female managers lead to lower risk-taking (Huang and Kisgen, 2013; Faccio et al., 2016). Therefore, we use the dummy variable *CEO male* in our regressions. Top executives holding an

MBA or with specialized postgraduate qualifications are more likely to have superior risk-taking skills and invest more aggressively (Bertrand and Schoar, 2003; Farag and Mallin, 2018). To account for CEO education, we use two dummies, i.e., a binary variable for CEO reaching advanced higher education (*CEO master/PhD*) and a binary variable for CEO graduating in business or economics (*CEO degree business/economics*). Finally, financial expert CEOs might be more or less inclined to hedge. On the one hand, financial experience may temper risk aversion, and expert CEOs might hedge less (Bodnar et al., 2019). On the other hand, hedging with complex derivatives requires advanced financial understanding, and financial expert CEOs might hedge more. We control for this effect through a binary variable (*CEO experience*) that identifies a financial expert CEO, i.e., a CEO with experience in banking or investment firms, large auditing firms, or finance-related roles, as in Custódio and Metzger (2014).

We employ a set of control variables at the firm level. We proxy the firm size with (the log of) *Sales*, we use *ROA* and *Tobin's Q* for profitability and expected growth opportunities, respectively, we include the firm's *Leverage* (net financial position over total invested capital), a liquidity measure (*Cash*, i.e., the ratio between cash and cash equivalents and total assets), and a dummy to detect firms which pay dividends (*Dividend-paying*).

Higher conservatism of family firms aimed at protecting reputation and socioemotional wealth should lead to a progressively stronger impact of *Family CEO*, *Family CEO, founding family*, and *Founder CEO* on a firm's likelihood of hedging. Belonging to the controlling family, founding family or being the firm's founder gradually increases the CEO's attachment to the organization (Gómez-Mejía et al., 2007), and makes family CEOs more concerned with socioemotional wealth, the long-term well-being of the firm (and the family), and reputation (Abebe et al., 2020).

After testing our hypotheses, we investigate the channels through which family and family CEO variables affect a firm's hedging decision. Based on the theoretical discussion, we suggest three testable channels consistent with the higher propensity to hedge of family firms. First, family firms are more conservative because of the underdiversified equity portfolio held by the controlling shareholder, and because families wish to protect a firm's reputation and socioemotional wealth. Second, family firms suffer from greater information asymmetry, leading to potentially costlier external financing. Third, family firms are reluctant to dilute their control,

as the controlling family is prone to wealth extractions. To explore these channels, we interact proxies of underdiversification, information asymmetry, and internal and external corporate governance mechanisms with the family status and family CEO variables, and we use them as regressors for the likelihood of hedging.

We use the equity stake of the first shareholder (*First shareholder's equity*) and the degree of separation between ownership and control to test underdiversification. For the latter, we compute the difference between voting and cash flow rights of the ultimate controlling shareholder, based on a 20% threshold of the voting capital (*OC difference*). We compute voting rights according to the weakest-link principle in pyramidal groups (e.g., Faccio and Lang, 2002), and cash flow rights account for pyramids and dual-class shares. The larger the first shareholder's equity stake, the greater the underdiversification, while the opposite holds for *OC difference*. A higher *OC difference* suggests that the first shareholder controls the firm with less capital invested.

Three common proxies for asymmetric information are related to stock trading (Leuz and Verrecchia, 2000; Caprio et al., 2020). The first is *Turnover*, i.e., the ratio between the monthly volume of trade and the firm's number of shares outstanding (averaged over each year), which is negatively correlated with a firm's information asymmetry. The second is *Bid-ask spread*, i.e., the ratio between the monthly bid-ask price difference and the price midquote (averaged over each year), which positively correlates with information asymmetry. The third is Amihud (2002) illiquidity, i.e. a measure of price impact. As for the bid-ask spread, *Amihud's illiquidity* positively correlates with information asymmetry. Finally, we also use the *Number of analysts* as an alternative proxy of asymmetric information. The higher the analyst coverage, the lower the expected information asymmetry (e.g., Croci et al., 2011).

We rely on corporate governance attributes to proxy for the likelihood of wealth extractions since they correlate with the probability of the controlling shareholder siphoning out private benefits. As for internal monitoring devices, we use variables related to the board of directors. The degree of independence of the board is commonly viewed as beneficial to shareholder value since independent directors should act as active monitors of the firm's management and be less subject to agency issues (Dahya et al., 2008; Nguyen and Nielsen, 2010;

Adams et al., 2010). Therefore, we collect the number of directors (*Board size*) and the fraction of them who are independent (*Independent directors*). Since the share of independent directors has gradually increased over time,[9] we construct a dummy variable (*Highly independent board*) to detect firms with the highest fraction (first quartile[10]) of independent directors each year. Besides director independence, the presence of minority-appointed directors is another device aimed at curtailing agency costs and protecting minorities in firms with concentrated ownership (Bianchi et al., 2011; Belcredi et al., 2013). These directors are unrelated to the controlling shareholder and should serve as an effective monitoring device (Bajo et al., 2020).[11] The dummy variable *Directors from minority list* detects firms in which such minority directors are present.

CEO duality is another variable relating to the board composition which has implications on the quality of a firm's corporate governance. This dummy variable takes the value of 1 if the CEO is also Chair of the Board of Directors. Agency theory predicts that concentrating the two titles in the hands of a single person is value-detrimental and encumbers the firm's governance (Jensen and Meckling, 1976; Fama and Jensen, 1983; Aktas et al., 2019). If the CEO is also the chair, the board's monitoring role is weaker, and agency costs are likely to increase. However, management scholars argue that combining the two positions bolsters the firm's leadership, leading to prompter and more efficient decision-making. This should therefore improve performance (for a discussion of the stewardship theory, see Krause et al., 2014). Ultimately, the validity of *CEO duality* to proxy the likelihood of wealth extractions is an empirical matter (Dey et al., 2011; Byrd et al., 2012).

We also look at external monitoring devices to measure a firm's corporate governance strength. We use a dummy variable that detects the presence of a second institutional shareholder (*Second institutional shareholder*) and their equity stake (*Second institutional*

[9] The average fraction of independent directors in our sample is 38% in 2009 and 48% in 2018. According to the 2020 Report on Corporate Governance in Italy elaborated by Assonime, the association of Italian joint stock companies, "[t]he weight of independent directors is constantly increasing, [up to] 46% in 2020, on average" (Assonime, 2020).

[10] As a robustness exercise, we also use the median and the 90th percentile to classify a firm with a highly independent board. The results of the multivariate analyses using this covariate are qualitatively unchanged.

[11] A 2005 reform introduced the so-called "slate voting" to all Italian listed firms. Since then, minority shareholders can present a slate of candidates, and at least one director has to be elected from the most-voted minority slate.

shareholder's equity). The positive impact of institutional investors on a firm's value and the quality of corporate governance is well documented (e.g., see Ferreira and Matos, 2008, for a cross-country study, and Bajo et al., 2013, for Italy).

All variables are described in detail in Table A1 (in Appendix).

4. Results

4.1 Univariate analysis

Table 1 shows the distribution of firms exposed to currency risk and the share of hedgers, by year (upper panel) and industry (lower panel). For industry classification, we use the 10-Industry Classification Benchmark (ICB) provided by the Italian Stock Exchange (*Borsa Italiana*). Only nine different industries are present, as firms belonging to the financial sector are *ex-ante* excluded.

Please insert Table 1 here

Of the 130 unique firms in our sample, about 74% are hedgers, on average. The share of hedgers is evenly distributed over time. For what concerns industry distribution, we note that hedgers' incidence is higher in oil & gas, consumer goods, telecommunications, and utilities, and lower in healthcare and technology.

Please insert Table 2 here

Table 2 reports the descriptive statistics of the variables for our sample. Mean and median values of firm-level financial variables are generally close, with the interesting exception of size (the average firm in our sample has net sales of €3.8 billion, while the median figure is about six

times smaller, i.e., €669 million). This is because the variable is highly skewed, as the average net sales coincide with the 83rd percentile of the distribution. Our sample is representative of the Italian equity market, where the 40 firms composing the FTSE MIB (the main stock index) account for about three-quarters of the total market capitalization (data as of December 2018, the end of our sample period, as reported by the Italian Stock Exchange). The average firm in our sample has an annual ROA and a Tobin's Q of 3.2% and 1.6 times, respectively. It also shows a leverage ratio of about 44% and has a 12% cash ratio. Finally, about two-thirds of the firms in our sample pay dividends.

When considering the family status, we note that seven firms out of ten are family-controlled. This figure is in line with other papers studying the Italian equity market (see, for instance, Bajo et al., 2020, where family firms account for 65% of the sample in the period between 2014 and 2018). Slightly more than one-third of the firms in our sample (37%) are run by a family CEO. This means that the subsample of family firms is almost equally divided between family firms in which a family member acts as a CEO and family firms managed by an outside professional CEO. About one-fourth of the sample (25.6%) is composed of firms managed by a CEO belonging to the founding family. This represents about 36% of all family firms in our sample (= 25.6/70.7). Finally, 8.3% of the observations involve founder-managed firms, i.e., 12% of family-controlled firms (= 8.3/70.7). Since a founding family CEO is present in 25.6% of the firms, it follows that an heir CEO (i.e., a second or higher-generation CEO) is in charge of two founding family-managed firms out of three (= 17.3/25.6).

Focusing on CEO characteristics, it is worth noting that the average CEO is 56 years old (one-fourth of the CEOs is over 62), and they have been in charge for about eight years (*CEO tenure*). There is almost no variability in gender, as 97% of the CEOs are males. Regarding education and experience, 16% of the CEOs reached advanced higher education (at the level of an MBA or a PhD), about 40% have an educational background in business or economics, and about 13% have had prior professional experience in finance.

Finally, the last set of variables in Table 2 is intended to describe our sample in terms of diversification of the first shareholder, degree of information asymmetry, and strength of corporate governance. The average (median) first shareholder in our sample has a stake of about

50% (54%) of the firm's capital. The third quartile of the variable is 63%, close to two-thirds of the votes required to approve any resolution at the extraordinary general meeting. These figures are in line with other studies of the Italian market (e.g., Bajo et al., 2020). The separation between ownership and control via pyramiding and non-voting shares is not widespread anymore, as it is only present in 22% of the observations in our sample (the average of the dummy variable *OC separation*). Even when ownership and control separation is present, the difference between voting and cash flow rights is modest (the average *OC difference* is 3.5% and the third quartile is zero). These figures are consistent with a decreasing use of such control-enhancing mechanisms by Italian listed firms (Bajo et al., 2020; Bigelli et al., 2011; Caprio and Croci, 2008). The average monthly stock turnover is about 7% of a firm's market capitalization, with significant variability, the average bid-ask spread is 1.3%, and the average firm is covered by 7.3 analysts (we also report the descriptive statistics for *Amihud's illiquidity*, but their interpretation is not meaningful *per se*). As for our corporate governance variables, the average (median) firm has a board consisting of 10 (9) directors. On average, 43% of them are independent, and 37 firms out of 100 in our sample have at least one minority-appointed director. The CEO is also the board's chair in about 36% of the observations. The second shareholder is an institutional investor in more than one-third of the observations, confirming the increasing importance of such investors in Italy, especially after several reforms that favored their activism (Belcredi and Enriques, 2015). Finally, we report that firms in our sample have an annual average (median) cash flow volatility of 6.8% (2.9%).

Please insert Table 3 here

Table 3 compares hedgers and non-hedgers and provides the first univariate evidence of the variables associated with hedging. When considering firm-level variables, we note that hedgers are significantly larger, more profitable, and more likely to pay dividends. They are also more leveraged, less cash-rich, and are worth slightly more, although these differences are statistically insignificant. Finally, hedgers have lower cash flow volatility. Overall, this picture is consistent with early theories of risk management (Smith and Stulz, 1985; Froot et al., 1993).

Regarding firm ownership, hedgers are significantly more likely to be family-controlled (73% of hedgers *vs.* 65% of non-hedgers), but the 8% difference is only significant at the 10% level. When considering the CEO's identity, we note that 40% of hedging firms are managed by a family CEO, against less than 30% of non-hedgers. Here, the 10.6% difference is both statistically significant and sizeable. When looking more closely at the variables linking the CEO to the founding family, the difference between hedgers and non-hedgers becomes even more pronounced. About 29% of hedging firms are managed by a founding family CEO, against 15% of non-hedgers (the 14.7% difference is strongly significant). The founder is at the helm of hedging firms in 10% of the cases, against 3.7% of non-hedgers (the 6.3% difference is again significant). Interestingly, hedgers are also more likely to be managed by an heir CEO than non-hedgers (19 *vs.* 11%). Among CEO personal characteristics, only graduate education in business or economics seems to play a role. This univariate evidence suggests that there is a positive but weak effect of the family status on the likelihood of hedging, and a much stronger impact of the CEO's identity.

Please insert Table 4 here

Table 4 contrasts hedgers and non-hedgers within the subsample of family firms, family firms led by a family CEO, and family firms led by a CEO belonging to the founding family. Comparing hedgers and non-hedgers at a progressively narrower level of classification of family firms provides a clearer picture since we have previously documented that family firms are more likely to be hedgers.

The first remark from Table 4 is that the identity of the CEO is confirmed to be very relevant in discriminating between hedgers and non-hedgers. Within family firms, 55% of hedgers have a family CEO (against 45% of non-hedgers). Within family firms led by a family CEO, 74% of hedgers have a CEO belonging to the founding family (against 50% of non-hedgers). Finally, within family firms managed by a founding family CEO, 34% of hedgers are led by the founder (against 25% of non-hedgers). As a second observation, Table 4 also allows us to draw the first univariate evidence on the channels potentially driving the higher propensity to hedge of family-led firms.

When comparing family hedgers to family non-hedgers based on variables proxying underdiversification, information asymmetry, and quality of internal and external corporate governance, we find some evidence that hedgers are covered by a higher number of analysts (e.g., 7.4 *vs.* 3.4 in the family firms subsample) and are more likely to have a second institutional shareholder (e.g., 40 *vs.* 31% of the observations in the family firms subsample). However, this evidence is inconclusive since it depends on the larger size and profitability of hedgers, for which we will control later in the paper.

Please insert Table 5 here

Table 5 reports the pairwise correlation coefficients between the variables we will later employ in the multivariate analysis. Noteworthy is the significant correlation between *Family CEO* and some CEO-related attributes. In particular, *Family CEO* is negatively associated with *CEO master/PhD*, *CEO degree business/economics*, and *CEO experience*, and positively related to *CEO high tenure*. This highlights how family CEOs seem to be less specialized and have less financial experience. Along with the high tenure, this evidence supports the conjecture that their appointment is likely to be motivated by family ties rather than by their qualification. Similar evidence is also generally registered for *Family CEO, founding family,* and *Founder CEO*. Worth mentioning is the positive and significant correlation between *CEO duality* and *CEO high tenure*, and between *CEO duality* and all family CEO variables. It is not uncommon for family CEOs, especially the founder, to also keep the chairmanship within the board.[12]

4.2 Multivariate analysis

4.2.1 Likelihood of hedging

[12] Some known examples present in our dataset are Mr. Brunello Cucinelli, CEO (until 2020) and chairman of the firm founded with his name, Mr. Nerio Alessandri, founder, CEO, and chairman of Technogym, and Mr. Diego Della Valle, CEO and chairman of Tod's and grandson of the founder, Filippo Della Valle.

Table 6 reports the coefficients of a linear probability model for the likelihood of hedging. In addition to firm-level variables, we control for unobservable factors affecting hedging at time and industry level through year and industry fixed effects. We prefer a linear probability model to non-linear models in order to obtain a more straightforward interpretation of coefficients. However, when we use logit models, all results remain qualitatively unchanged.[13] Standard errors are clustered at the firm level.

Please insert Table 6 here

Model 1 includes the variable *Family* to indicate family-controlled firms, along with firm-specific controls. Models from 2 to 4 investigate the role of a CEO's identity. The variables *Family CEO* and *Non-family CEO* are present in Model 2. Taken together, *Family CEO* and *Non-family CEO* identify family firms. In other words, in Model 2 (and in all subsequent models), the effect of non-family status is subsumed in the constant. Model 3 disentangles the effect of a CEO belonging to the founding family (regardless of their generation). To this purpose, the variable *Family CEO* is broken down into *Family CEO, founding-family* and *Family CEO, non-founding-family*. Again, after considering *Non-family CEO*, the effect of non-family ownership is subsumed into the constant. Finally, Model 4 separates the role of the founder CEO from that of an heir CEO. *Founder CEO* and *Heir CEO*, taken together, constitute the variable *Family CEO, founding-family*, as in the previous model.

The hedging decision is positively associated with the firm's size (*Log sales*), as evident economies of scale exist in hedging. Size is, however, the only significant financial control. Interestingly, Model 1 shows that family-controlled firms are not associated with a significantly increased propensity to hedge. In Model 2, *Family CEO* is positive and significant (at the 10% level). The coefficient indicates that the presence of a family CEO increases the likelihood of hedging by about 10 percentage points, making it also significant from an economic viewpoint. Note that both the constant and *Non-family CEO* are insignificant, meaning that non-family firms

[13] We will present logit regressions in the robustness section later in the paper.

(i.e., the intercept) and family firms run by a professional CEO (i.e., *Non-family CEO*) are not associated with significantly higher propensity to hedge. Overall, the evidence suggests that the presence of a family CEO rather than the family ownership contributes to the propensity to hedge, and it is consistent with the univariate findings.

Model 3 disentangles the role of the CEO belonging to the founding family. The variable *Family CEO, founding-family* is positive and significant at the 5% level. Its coefficient suggests that a founding family CEO (regardless of their generation) increases the likelihood of hedging by about 15 percentage points. It is worth noting that when the CEO belongs to the controlling family, but this is not the founding family, there is no such an effect (*Family CEO, non-founding-family* is insignificant). As we have already documented in Model 2, a professional outsider CEO in family firms (*Non-family CEO*) also does not affect hedging.

Finally, Model 4 analyzes the effect of a CEO's generation when they belong to the founding family. *Founder CEO* is strongly significant (at the 1% level). Its coefficient suggests that the founder, when running the firm, increases the likelihood of hedging by about 25 percentage points. *Heir CEO* is also positive, but insignificant. Neither of the other variables (*Family CEO, non-founding-family* and *Non-family CEO*) complementing the dummy *Family* is significant. Overall, looking at these four models, it appears that *Founder CEO* is the main driver of the results.

We augment all models in Table 6 with CEO personal attributes, including education and experience, as additional controls. We do not tabulate these results, as all CEO attributes are insignificant. The magnitude and the significance of the main variables are virtually unchanged. The only difference concerns *Heir CEO*, which is now significant at the 10% level (but the coefficient is lower than that of *Founder CEO*, i.e. 0.14 *vs.* 0.23). A Wald test of equal coefficients of *Heir CEO* and *Founder CEO* is unable to reject the hypothesis that their difference is equal to zero (p-value = 0.29).

These findings emphasize the significant role of a family CEO—particularly when the CEO belongs to the founding family, and when they are the firm's founder—on the hedging decision. This evidence supports the more conservative behavior of family agents and is in line with hypotheses 2 and 3a.

As we previously documented, a CEO's tenure may affect their risk-taking. In Table 7, we interact a CEO's tenure with family CEO variables to investigate this effect. In so doing, we explore the role of tenure on the propensity to hedge.

Please insert Table 7 here

The results in Table 7 are insightful. In Model 1, the baseline variable characterizing a family CEO, i.e., not interacted with *CEO high tenure*, loses its significance. However, the interaction between *Family CEO* and *CEO high tenure* is positive and significant (at the 5% level). The interpretation is that family CEOs hedge more when they have been at the helm for long. Long-tenured family CEOs are about 10 percentage points (= 0.22 – 0.12) more likely to hedge. For family firms run by a professional manager and non-family firms, a CEO's high tenure is instead associated with a 12 percentage points lower probability of hedging. This result is in line, for example, with Souder et al. (2012), who find that firms led by long-tenured founders have a lower propensity to embark on risky strategies, but the opposite holds in firms led by long-tenured professional managers.

Model 2 disentangles the effect of a long-tenured family CEO belonging to the founding family (regardless of the generation). The same conclusion holds. The interaction between *Family CEO*, *founding-family* and *CEO high tenure* is positive and significant, while the base variable *Family CEO*, *founding-family* is not. Long-tenured founding-family CEOs contribute to the positive significant coefficient of *Family CEO*, *founding-family* in Table 7. Finally, when looking at Model 3, the level variables *Founder CEO* and *Heir CEO* are insignificant. When interacted with *CEO high tenure*, *Founder CEO* recovers its significance, whilst the interaction between *Heir CEO* and *CEO high tenure* does not. Long-tenured founder CEOs increase the probability of hedging by about 36 percentage points (the baseline variable *CEO high tenure* is insignificant, in Model 3), a substantial result. This evidence is in line with hypothesis 4, as long-tenured family CEOs—especially when they coincide with the founder—behave more conservatively and are more likely to hedge.

4.2.2 Underdiversification, information asymmetry, corporate governance, and value

The evidence so far supports the higher propensity to hedge of family agents. Moreover, the desire of family agents to protect their socioemotional wealth and avoid reputational losses is consistent with the increasingly stronger effect of *Family CEO*, *Family CEO, founding family*, and *Founder CEO*, as well as with the significant role of a CEO's high tenure. However, other channels might contribute to these results, namely family firm's underdiversification, greater information asymmetry, and higher likelihood of wealth extractions. In this section, we aim to empirically investigate whether these three channels also have a role in explaining the previous evidence.

Underdiversification

We test whether underdiversified family firms hedge more in Table 8. We use the dummy variable *High concentration* (Panel A) to identify firms whose first shareholder holds an equity stake larger than the median in our sample (54.3%). We prefer the dummy *High concentration*, as the correlation between the continuous variable *First shareholder's equity* and the family firm's status (*Family*) is about 51%, likely plaguing our regressions with multicollinearity.[14] The results of a linear probability model for hedging are reported in Panel A of Table 8.

Please insert Table 8 here

Family CEO variables confirm their positive significance in models 2 to 4, and the coefficients are similar to those previously reported. The interactions between family CEO variables and *High concentration* are insignificant in all models.

In Panel B of Table 8, we replace *High concentration* with *OC separation*. The logic is that family firms can reduce the capital invested (and hence underdiversification) through control-

[14] The correlation between *High concentration* and *Family* is still high (36.5%, as shown in Table 5), as about 62% of family firms have highly concentrated ownership (from Table 4). However, the dummy variable allows a variance inflation factor (VIF) of about 3 to be reached in all models of Table 8. As an example, using the continuous variable *First shareholder's equity* would lead to a VIF of about 9 in Model 4, and none of the family CEO variables (as well as *First shareholder's equity*) would be significant.

enhancing devices, such as pyramids and non-voting shares. Baseline family CEO variables retain their positive significance, but the interaction with *OC separation* is now negative in all models. For example, a family firm has a 12% higher likelihood of hedging than non-family firms (Model 1), but a 10% lower likelihood of hedging in firms with positive ownership-control separation (= 0.117 – 0.221). *OC separation* does not have any effect in non-family firms. A similar interpretation can be extended to family CEO variables in models 2 to 4. Overall, family firms retaining control with less capital invested hedge less. This evidence is mildly consistent with the role of diversification in affecting the hedging policy of family firms. All other things being equal, the lower the equity capital invested for a given amount of voting power, the more diversified the controlling shareholder, and the lower the incentive to hedge.

Information asymmetry

Information asymmetry is also relevant for family-controlled firms. Opaqueness possibly makes outside financing more expensive, leading us to expect a higher likelihood of hedging. In Table 9, we test this channel. In Panel A, we use *Bid-ask spread*. In Panel B, we proxy higher information asymmetry using (the log of) *Amihud's illiquidity* and in Panel C, we use the (log of 1 plus the) *Number of analysts*.[15]

Please insert Table 9 here

Overall, we find some evidence that opacity is a possible channel leading family firms to hedge more. In Panel A, all products between *Bid-ask spread* and family variables are positive and statistically significant, while baseline family variables are not, and the level variable *Bid-ask spread* is negative and slightly significant (but the absolute value of the coefficient is smaller than that of the interacted variables in all models). These results suggest that family and family-led firms with higher bid-ask spread hedge more. However, this conclusion has to be taken cautiously.

[15] We also use *Turnover* as a proxy of asymmetric information. *Turnover* is never significant in explaining hedging, and neither are its interactions with *Family* and family CEO variables. We do not tabulate these results for brevity.

As we will show, hedging reduces cash flow variability, and this might, in turn, reduce the bid-ask spread. This is consistent with the negative and significant coefficient of *Bid-ask spread* in Panel A of Table 9. In other words, endogeneity may blur the impact of *Bid-ask spread* on hedging. We have repeated our analysis in Panel A of Table 9, replacing *Bid-ask spread* with its lagged value. The results (unreported) are qualitatively unchanged, except for the baseline variable *Bid-ask spread* (lagged), which is now no longer significant.

Panel B shows a similar picture when we use *Amihud's illiquidity*, a measure of price impact. Baseline family and family CEO variables retain their significance, but this also holds for the positive interactions between *Amihud's illiquidity* and family variables (*Amihud's illiquidity* alone is insignificant).

Panel C proxies opacity with the analyst's coverage. Here, the higher the number of analysts, the lower the information asymmetry. As previously, baseline family and family CEO variables confirm their significance, and the interaction between *Log (1 + number of analysts)* and family CEO variables is negative and significant. Overall, the exercises in Table 9 support the asymmetric information channel in explaining the higher propensity to hedge of family firms.

Corporate governance

Family firms are reluctant to dilute control as they might be more prone to wealth extractions. We now test whether the quality of internal and external governance mechanisms impacts the propensity to hedge of family firms.

We use *Highly independent board* and *Directors from minority list*, in two distinct sets of regressions, as proxies for the active monitoring role of the board of directors (we also control for the board size). While family CEO variables retain their positive significance, there is no evidence that family-led firms are more likely to hedge when the board is less effective in monitoring the CEO. All interactions between *Highly independent board* with family and family CEO variables are not significant. The same evidence holds when we use *Directors from minority list*. As mentioned, we use two alternative definitions of *Highly independent board* (higher than the annual median and 90th percentile of the fraction of independent directors), but the conclusion is unchanged. For brevity, we do not tabulate these results.

Please insert Table 10 here

Next, we use *CEO duality*. The results are reported in Table 10. Different from before, *CEO duality* positively impacts the likelihood of hedging of family firms in all models. Neither of the baseline family variables, nor *CEO duality* alone is significant. The evidence is similar to that in Table 7 for *CEO high tenure*. This is not surprising, as there is a positive and significant correlation between *CEO duality* and *CEO high tenure* (27%). It is not uncommon for family CEOs to keep the chairmanship within the board. While agency theory suggests that *CEO duality* proxies higher expected agency costs, it is difficult to disentangle its effect from self-identification with the firm and socioemotional wealth, which are stronger in founder-led firms, where (long-tenured) CEOs are more likely to retain the board chairmanship. In other words, *CEO duality* may not validly proxy the likelihood of wealth extractions.

Lastly, we employ the dummy variable *Second institutional shareholder*, detecting an institutional blockholder as the second most relevant shareholder. The negative sign of the interactions between *Second institutional shareholder* and family CEO variables would support the conclusion that institutional investors' active monitoring reduces potential wealth extractions, and thus the hedging utility to family agents. However, none of the interacted variables is significant. We repeat the same empirical exercise replacing the dummy *Second institutional shareholder* with the continuous variable *Second institutional shareholder's equity*. The conclusion is unchanged. We do not tabulate these results to save space.

Taken together, this evidence does not offer much support to the conjecture that family firms with weaker corporate governance mechanisms aim at retaining control and hedge more.

Hedging, value, and risk

Finally, we explore the relationship between hedging, value, and risk. We also test whether the quality of corporate governance mechanisms has a different impact on value for

hedging family firms against non-hedging family firms. That would provide some empirical support for the agency motivation of hedging in the previous paragraph.

First, we run a linear regression of *Tobin's Q* on *Hedging*, *Family*, and family CEO variables, and their interactions. The univariate evidence in Table 3 shows that hedgers have an average *Tobin's Q* of 1.6 times, against 1.5 of non-hedgers. The difference is positive but economically small and statistically insignificant. Hedging family firms are worth the same as non-hedging family firms (*Tobin's Q* is 1.7 times in both subsamples, unreported). Similarly, hedgers and non-hedgers within family firms led by a family CEO, and hedgers and non-hedgers within family firms led by a founding family CEO, exhibit the same insignificant differential *Tobin's Q* (unreported). Consistent with this univariate evidence, the multivariate analysis (untabulated) indicates that hedgers do not have a significantly higher value in our sample.[16] The interactions between *Hedging* and *Family* and family CEO variables are all insignificant.

We then test whether a difference in *Tobin's Q* exists between hedging and non-hedging family firms characterized by different corporate governance characteristics. We regress *Tobin's Q* on the three-way interaction between *Hedging*, *Family* and family CEO variables (one at a time), and *High independent board*. Similarly, we do the same by regressing *Tobin's Q* on the three-way interaction between *Hedging*, *Family* and family CEO variables (one at a time), and each of variables *Directors from minority list*, *CEO duality*, and *Second institutional shareholder*. No significant differences in *Tobin's Q* exist, regardless of the governance proxy we employ, as the three-way interaction is never significant (untabulated). Combining these results with the evidence previously reported yields little support to the agency motivation for hedging. However, it is important to acknowledge that we are only able to distinguish between hedgers and non-hedgers in our sample since we do not have enough information to measure the extent of hedging. While hedgers and non-hedgers are not differently valued by the market, we are unable to be conclusive on whether firms hedging more are worth the same as firms hedging less.

[16] The empirical evidence on the relationship between hedging and value is mixed. Several papers support value creation from hedging (e.g., Allayannis and Weston, 2001; Gilje and Taillard, 2017). Notably, however, some others find an insignificant relationship (e.g., Jin and Jorion, 2006), or even a negative relationship (e.g., Fauver and Naranjo, 2010), in firms with greater agency problems. We do not wish to contribute to the broader debate on hedging and value since our paper is focused on the likelihood of hedging of family firms.

Please insert Table 11 here

Finally, we check whether hedging impacts cash flow volatility. In Table 11, we run a linear regression of *Cash flow volatility* on *Hedging*, *Family* and family CEO variables, and their interactions. In line with our expectations (and with the univariate evidence in Table 4), hedging has a negative impact on the cash flow volatility of family firms (Model 1). This significant relationship is confirmed when a *Family CEO* is present (Model 2). Family firms successfully hedge to reduce the effect of marketable risks on the variability of their operating cash flows.

5. Robustness

Summing up, we reported consistent evidence of a positive correlation between the family status of a CEO—in particular when they belong to the founding family, and when they are the founder—and a firm's propensity to hedge. We now carry out several robustness exercises to corroborate this evidence and reassure on causality.

5.1 Subsamples

Since family firms may be different from non-family firms in terms of firm- and CEO-specific variables, understanding the determinants of hedging within the subsample of family firms is insightful. In Panel A of Table 12, we repeat the analysis on the likelihood of hedging using progressively nested subsamples of family firms. In Model 1, we employ a sample only composed of family firms (602 observations). In Model 2, the sample only includes family firms run by a family CEO (317 observations). Finally, in Model 3, we only use family firms where the family CEO belongs to the founding family (218 observations). Subsampling at progressively narrower levels of classification allows us to disentangle the effect of *Family CEO vs*. *Non-family CEO* within family firms (Model 1), the effect of *Family CEO, founding family vs*. *Family CEO, non-founding family* within firms run by a family CEO (Model 2), and the effect of *Founder CEO vs*. *Heir CEO* within firms run by a founding-family CEO (Model 3).

Please insert Table 12 here

The results are similar to those in Table 6. It is confirmed that *Founder CEO* (Model 3) drives the significant effect of *Family CEO, founding family* in Model 2. *Family CEO* (Model 1) is not significant in this analysis (its p-value is 0.15, it was 0.09 in Table 6), likely due to fewer observations (the subsample here is 30% smaller). Concerning the control variables, only the firm's size (unreported) is significant.

It is apparent from our previous analyses that larger firms hedge (unsurprisingly) more. As the correlation between *Log sales* and *Family* and family CEO variables is generally negative, size should not be a relevant observable confounder on the likelihood of hedging. However, since our sample size is highly skewed, as shown in Table 2, it may be worth checking whether our results are robust when excluding the largest firms. Panel B of Table 12 shows the results once we exclude the first quartile of observations by *Sales*. The results are qualitatively similar to those in Table 6.

5.2 Non-linear models

We have previously used a linear probability model in all our regressions. We now re-run the same set of regressions for the likelihood of hedging but using a pooled logit instead of a linear probability model (Table 13). We report average marginal effects (AMEs) as an alternative to logit coefficients.

Please insert Table 13 here

As already documented, *Family CEO* and *Family CEO, founding family* are significant, and their AME is progressively higher, from Model 2 to Model 3. Model 4 shows that a founder CEO

increases the probability of hedging by about 23 percentage points, while *Heir CEO* is insignificant. These intensities are comparable to the OLS coefficients as in Table 6.[17]

5.3 Causality

Although our evidence is consistent with the theoretical framework we developed, one may argue that there is an endogenous selection between firms and CEOs. Appointing a family CEO can be a non-random event. For instance, observable or unobservable firm characteristics may be correlated with the choice of hiring a family CEO, such that the resulting CEO's hedging decisions are the consequence of this endogenous matching. In this case, the firm's hedging behavior might be driven by confounders at the firm level correlated with CEO attributes. To alleviate such concerns, we proceed as follows.

First, we use propensity score matching to control for observable firm and CEO attributes correlated with family status and family CEO variables, and we estimate the likelihood of hedging using a sample composed of an equal number of treated and untreated observations. Second, we investigate how a change in the family status and family CEO's identity impact a variation in the hedging strategy, therefore controlling for unobserved (time-invariant) firm characteristics that affect the hedging decision. Third, we restrict our analysis to the subsample of firms that underwent a transition in the *Family CEO* variable to avoid the overlap between firm attributes and CEO identity and control for unobserved firm characteristics affecting the likelihood of hedging.

5.3.1. Propensity-score matching

We address the situation where observable firm's characteristics, rather than the family CEO's identity, explain a firm's hedging policy. Propensity score matching techniques allow us to contrast the hedging policy of treated and untreated firms, which are similar regarding firm- and CEO-specific characteristics. The matching procedure employs the set of firm-level variables (*Log sales*, *ROA*, *Leverage*, *Cash*, *Dividend-paying*, *Tobin's Q*) as well as the vector of CEO-level controls

[17] One industry dummy (oil & gas) perfectly predicts the dependent variable in all logit regressions. Hence, 36 firm-year observations for this industry are dropped.

(*Log CEO age*, *CEO male*, *CEO high tenure*, *CEO degree business/economics*, *CEO master/PhD, and CEO experience*). We contrast the hedging policy of four pairs of equally-sized subsamples composed of firm-year nearest neighbors (without replacement), i.e., firm-year observations that minimize the distance between propensity scores (Rosenbaum and Rubin, 1983; Imbens, 2004). Our treatment variables are *Family*, *Family CEO*, *Family CEO, founding family*, and *Founder CEO*.[18]

Please insert Table 14 here

Table 14 shows the results of a linear probability model for hedging. In Model 1, half of the observations are family firms, while the remaining are non-family firms. In Model 2, half of the observations are family firms run by a family CEO, while the remaining are family firms run by a professional (i.e., non-family) CEO. In Model 3, half of the observations are family firms run by a CEO belonging to the founding family, while the remaining are family firms run by a family CEO not belonging to the founding family. Finally, in Model 4, half of the observations are family firms run by a founder CEO, while the remaining are family firms run by an heir CEO. In other words, models 2 to 4 of Table 14 are the propensity-score matching equivalent of the three models in the first panel of Table 12. Matching allows the effect of family and family CEO variables to be isolated from that of potential observable confounders on the hedging decision.

The results of Table 14 suggest a higher likelihood of hedging of firms managed by a founding family CEO, particularly the founder. This evidence is not driven by differences in observable firm characteristics.

5.3.2 CEO change

[18] We check covariance balance using a t-test of mean differences for the variables we use in propensity score matching. The matching procedure is highly successful in reducing the mean differences between the two samples, i.e. treated and untreated, especially with regard to *Log sales*, *ROA* and *Dividend paying*, which have been shown (Table 3) to be significantly different between hedgers and non-hedgers. We do not report the results for brevity.

We now focus on firms that experience a change in the family status and family CEO's identity during our sample period.

Please insert Table 15 here

As Table 15 shows, within our 10-year period, we observe 10 changes in the firm's family status, and 23 changes in the status of a family CEO (in 12 cases, a family CEO is replaced with a non-family CEO, while the opposite occurs in 11 instances). More in detail, when looking at a change of a founding-family CEO, we observe 13 cases, 3 of them involving the founder. We particularly wish to investigate how a change in a firm's family status and family CEO identity impacts a variation of the hedging strategy. Finding a positive relationship between the variation of a firm's family status and family CEO's identity, and a change in the firm's hedging policy allows us to alleviate endogeneity concerns, as we control for unobserved (non-time varying) firm characteristics that affect hedging decisions. As the firm is the same, a change in the hedging strategy is likely to be caused by the identity of the newly appointed CEO.

Table 15 shows univariate evidence of the association between a change in the family (and founding-family) CEO and a change in the firm's hedging behavior. Conditional on a newly appointed family CEO in place of a non-family CEO (11 cases), the firm opts for starting a hedging policy in 4 cases (36% of the total) and ceasing an active hedging policy in 1 case (9%). Conditional on appointing a non-family CEO instead of a family CEO (12 cases), the firm discontinues its active hedging in 5 cases (42% of the total), while the firm never opts for starting a new hedge. Concerning *Founding family CEO*, the univariate evidence is similar, as a change of *Founding family CEO* seemingly impacts a firm's new hedging policy. Table 16 tests this evidence in a multivariate setting.

Please insert Table 16 here

In the first three models of Panel A, we regress a dummy variable taking the value of 1 if the firm shows a positive change in the firm's hedging policy (i.e., from non-hedging to hedging) on the change in *Family* (Model 1), *Family CEO* (Model 2), and *Family CEO, founding family* (Model 3), along with the change in other CEO attributes, and firm controls. In the last three models of Panel A, which are identical for what concerns the covariates, the dependent variable is a dummy taking the value of 1 if the firm shows a negative change in the firm's hedging policy (i.e., from hedging to non-hedging). In other words, we model the likelihood of hedging (not hedging), conditional on being a non-hedger (a hedger) the year before. We only observe three changes of *Founder CEO*, and therefore we are not able to run any multivariate analysis involving this variable. The significant coefficients of *Change family CEO* and *Change family CEO, founding family* confirm their relevance on a change in the firm's hedging policy. Appointing a family CEO in place of an outside professional CEO (a founding-family CEO in place of a CEO not belonging to the founding family) increases the likelihood the firm switches to hedging (from not hedging) by 19 (25) percentage points. It also reduces the likelihood the firm discontinues an active hedging policy by 18 (23) percentage points.

Panel B of Table 16 investigates the likelihood of a change in hedging using a three-way dependent variable. In other words, the dependent variable now takes the value of –1, 0, or +1, depending on whether the firm passes from hedging to non-hedging, keeps its hedging policy unaltered, or passes from non-hedging to hedging, respectively. We use OLS in models 1 to 3 and an ordered logit in models 4 to 6. The coefficients of *Change family CEO* and *Change family CEO, founding family* are positive and significant in all models. The combined evidence of the two panels in Table 16 supports a causal relationship between a CEO's family status and the firm's hedging policy.

5.3.3 Transitioning subsample

As a third approach, we limit our analysis to the subsample of firms that underwent a transition in family CEO status within our sample period (23 CEO changes, corresponding to 16 firms and 131 firm-year observations). Restricting the sample only to firms that experienced a change in the *Family CEO* variable avoids the overlap between firm attributes and CEO identity.

Therefore, such an exercise should control for the effect of unobserved firm characteristics on the likelihood of hedging and attenuate endogeneity concerns (Bajo et al., 2021; Boubaker et al., 2020). Table 17 reports the results of this analysis. As before, due to the lack of variability on the founder CEO in this subsample, we are not able to add this variable to our models.

Please insert Table 17 here

Despite the low number of observations, the results reported in Table 17 confirm the main findings that family CEOs have a positive and significant effect on the likelihood of hedging, especially when they belong to the founding family.

6. Conclusion

This article studies the determinants of hedging in closely-held family-managed firms. We employ a sample of listed family firms in Italy between 2009 and 2018. Italy is an ideal empirical setting, as it is characterized by high ownership concentration and significant involvement of families. We find that family firms led by a family CEO are more likely to hedge, compared with an outside professional CEO. This effect is stronger in family firms led by a founding family CEO. We also report a prominent role of the founder CEO (as opposed to an heir CEO). Family (and founder) CEOs are more likely to hedge when they have been at the helm for long. This evidence supports the higher conservatism of family agents who wish to protect socioemotional wealth and avoid loss of reputation and control.

We investigate additional channels through which family firms and family CEOs may affect firm hedging, namely underdiversification, greater information asymmetry, and a higher likelihood of wealth extraction. Higher information asymmetry and, to a lesser extent, underdiversification significantly increase the likelihood of hedging, whereas corporate governance attributes proxying potential wealth extraction in family firms seem less important.

While hedging family firms have lower cash flow variability, they are worth the same as non-hedging family firms.

These findings underscore the significant role of a firm's "familiness" in explaining hedging decisions and, more broadly, a firm's strategic risk-taking. Although this evidence survives several robustness checks, we acknowledge that our empirical investigation has two main limitations. First, our sample represents the universe of non-financial listed firms in Italy from 2009 to 2018, but its size is limited. Sample size and the ensuing low number of CEO changes do not allow fully conclusive evidence on causality to be drawn. Second, due to the lack of analytic disclosure on hedging practices, we are unable to measure the extent of hedging. Therefore, our conclusions are strictly valid for the likelihood of hedging and are not immediately generalizable to the magnitude of hedging.

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Year	N	N, hedgers	%, hedgers
2009	68	51	75.0
2010	77	60	77.9
2011	78	59	75.6
2012	81	62	76.5
2013	87	66	75.9
2014	96	73	76.0
2015	86	60	69.8
2016	90	66	73.3
2017	102	75	73.5
2018	86	61	70.9
Total	851	633	74.4
Industry	**N**	**N, hedgers**	**%, hedgers**
Basic materials	22	16	72.7
Consumer goods	273	234	85.7
Consumer service	69	52	75.4
Health care	41	21	51.2
Industrials	276	184	66.7
Oil & gas	36	36	100.0
Technology	51	20	39.2
Telecommunication	15	14	93.3
Utilities	68	56	82.4
Total	851	633	74.4

Table 1 – *Distribution of firms and hedgers by year and industry*. This table reports the distribution of firms exposed to exchange rate risk and the share of hedgers, by year and industry.

	N	Mean	SD	Min	Q1	Median	Q3	Max
Sales, € mln	851	3,765.6	12,900.0	0.0	156.4	669.1	2,078.1	126,000.0
ROA, %	851	3.2	6.4	-20.5	0.7	3.4	5.7	22.6
Leverage, %	851	44.0	23.2	0.0	29.7	42.9	58.3	137.4
Cash, %	851	12.0	8.9	0.9	5.9	10.0	15.6	62.3
Dividend-paying, %	851	67.1	47.0	0.0	0.0	100.0	100.0	100.0
Tobin's Q	851	1.6	1.2	0.1	0.9	1.2	1.8	10.4
Family, %	851	70.7	45.5	0.0	0.0	100.0	100.0	100.0
Family CEO, %	851	37.3	48.4	0.0	0.0	0.0	100.0	100.0
Non-family CEO, %	851	33.5	47.2	0.0	0.0	0.0	100.0	100.0
Family CEO, founding family, %	851	25.6	43.7	0.0	0.0	0.0	100.0	100.0
Family CEO, non-founding family, %	851	11.6	32.1	0.0	0.0	0.0	0.0	100.0
Founder CEO, %	851	8.3	27.7	0.0	0.0	0.0	0.0	100.0
Heir CEO, %	851	17.3	37.8	0.0	0.0	0.0	0.0	100.0
CEO age, years	851	55.6	9.0	34.0	49.0	55.0	62.0	90.0
CEO male, %	851	96.9	17.2	0.0	100.0	100.0	100.0	100.0
CEO tenure, years	851	8.5	6.8	1.0	3.0	6.0	13.0	32.0
CEO high tenure, %	851	49.9	50.0	0.0	0.0	0.0	100.0	100.0
CEO master/PhD, %	851	16.0	36.7	0.0	0.0	0.0	0.0	100.0
CEO degree business/economics, %	851	40.2	49.1	0.0	0.0	0.0	100.0	100.0
CEO experience, %	851	12.9	33.6	0.0	0.0	0.0	0.0	100.0
First shareholder's equity, %	851	50.4	17.9	3.9	40.0	54.3	62.8	99.5
High concentration, %	851	50.1	50.0	0.0	0.0	100.0	100.0	100.0
OC difference, %	851	3.5	7.9	0.0	0.0	0.0	0.0	36.3
OC separation, %	851	22.0	41.4	0.0	0.0	0.0	0.0	100.0
Turnover, %	851	6.9	8.0	0.1	1.9	4.1	8.7	54.2
Bid-ask spread, %	851	1.3	1.7	0.0	0.4	0.8	1.6	10.5
Amihud's illiquidity	851	0.6	1.2	0.0	0.0	0.0	0.5	4.1
Number of analysts	851	7.3	8.8	0.0	1.0	3.0	10.0	42.0
Board size	851	10.0	2.8	5.0	8.0	9.0	12.0	18.0
Independent directors, %	851	42.8	16.4	13.3	30.0	40.0	54.5	88.9
Highly independent board, %	851	25.7	43.7	0.0	0.0	0.0	100.0	100.0
Directors from minority list, %	851	36.5	48.2	0.0	0.0	0.0	100.0	100.0
CEO duality, %	851	36.3	48.1	0.0	0.0	0.0	100.0	100.0
Second institutional shareholder's equity, %	851	2.5	4.6	0.0	0.0	0.0	5.0	33.4
Second institutional shareholder, %	851	36.3	48.1	0.0	0.0	0.0	100.0	100.0
Cash flow volatility, %	851	6.8	21.4	0.0	1.7	2.9	4.8	252.8

Table 2 – *Descriptive statistics*. This table reports the descriptive statistics of the sample. Variables are defined as in Table A1. All accounting variables (except *Sales*), *Turnover*, *Bid-ask spread*, and *Amihud's illiquidity*, are winsorized at the 1% level (i.e., 0.5% in both tails).

	Hedgers		Non-hedgers		
	N	**Mean**	**N**	**Mean**	**Difference**
Sales, € mln	633	4,793.7	218	780.4	4,013.4 ***
ROA, %	633	3.5	218	2.2	1.3 *
Leverage, %	633	44.3	218	43.1	1.2
Cash, %	633	11.8	218	12.7	-0.9
Dividend-paying, %	633	69.8	218	59.2	10.7 **
Tobin's Q	633	1.6	218	1.5	0.1
Cash flow volatility, %	633	5.7	218	10.2	-4.5 **
Family, %	633	72.8	218	64.7	8.1 *
Family CEO, %	633	40.0	218	29.4	10.6 **
Non-family CEO, %	633	32.9	218	35.3	-2.5
Family CEO, founding family, %	633	29.4	218	14.7	14.7 ***
Family CEO, non-founding family, %	633	10.6	218	14.7	-4.1
Founder CEO, %	633	10.0	218	3.7	6.3 **
Heir CEO, %	633	19.4	218	11.0	8.4 **
CEO age, years	633	55.8	218	55.1	0.8
CEO male, %	633	97.0	218	96.8	0.2
CEO tenure, years	633	8.4	218	8.8	-0.4
CEO high tenure, %	633	49.9	218	50.0	-0.1
CEO master/PhD, %	633	16.6	218	14.2	2.4
CEO degree business/economics, %	633	42.7	218	33.0	9.6 *
CEO experience, %	633	12.5	218	14.2	-1.7

Table 3 – *Descriptive statistics of hedgers and non-hedgers*. This table reports the descriptive statistics of the sample (851 firm-year observations), both for hedgers and non-hedgers. Variables are defined as in Table A1. ***, **, *, denote statistical significance of mean differences at the 1, 5, and 10% level, respectively.

	Family firms					Family CEO-firms					Founding family CEO-firms				
	Hedgers		Non-hedgers			Hedgers		Non-hedgers			Hedgers		Non-hedgers		
	N	Mean	N	Mean	Difference	N	Mean	N	Mean	Difference	N	Mean	N	Mean	Difference
Family CEO, %	461	54.9	141	45.4	9.5 *	.	.	.	.	.	.	.	.	.	.
Non-family CEO, %	461	45.1	141	54.6	-9.5 *	.	.	.	.	.	.	.	.	.	.
Family CEO, founding family, %	461	40.3	141	22.7	17.7 ***	253	73.5	64	50.0	23.5 ***	.	.	.	.	.
Family CEO, non-founding family, %	461	14.5	141	22.7	-8.2 *	253	26.5	64	50.0	-23.5 ***	.	.	.	.	.
Founder CEO, %	461	13.7	141	5.7	8.0 **	253	24.9	64	12.5	12.4 *	186	33.9	32	25.0	8.9
Heir CEO, %	461	26.7	141	17.0	9.7 *	253	48.6	64	37.5	11.1	186	66.1	32	75.0	-8.9
First shareholder's equity, %	461	56.1	141	56.4	-0.3	253	57.7	64	58.7	-0.9	186	58.3	32	61.1	-2.8
High concentration, %	461	61.0	141	64.5	-3.6	253	62.8	64	75.0	-12.2	186	64.5	32	87.5	-23.0 **
OC difference, %	461	3.9	141	3.7	0.2	253	4.5	64	4.2	0.4	186	2.0	32	1.6	0.4
OC separation, %	461	21.3	141	24.1	-2.9	253	26.5	64	28.1	-1.6	186	18.3	32	21.9	-3.6
Turnover, %	461	5.8	141	6.4	-0.6	253	4.8	64	5.9	-1.1	186	4.8	32	5.5	-0.7
Bid-ask spread, %	461	1.4	141	1.5	0.0	253	1.6	64	1.4	0.2	186	1.6	32	1.5	0.1
Amihud's illiquidity	461	0.6	141	0.8	-0.2	253	0.7	64	0.9	-0.2	186	0.7	32	1.2	-0.5 *
Number of analysts	461	7.4	141	3.4	4.0 ***	253	5.8	64	2.7	3.1 ***	186	6.4	32	3.3	3.1 *
Board size	461	10.3	141	9.5	0.8 **	253	9.8	64	9.1	0.7	186	9.9	32	8.4	1.5 **
Independent directors, %	461	40.7	141	38.7	2.0	253	40.1	64	38.2	1.9	186	40.2	32	35.5	4.7
Highly independent board, %	461	21.0	141	16.3	4.7	253	16.6	64	14.1	2.5	186	18.8	32	6.3	12.6
Directors from minority list, %	461	27.5	141	27.7	-0.1	253	17.8	64	28.1	-10.3	186	16.7	32	21.9	-5.2
CEO duality, %	461	40.3	141	36.2	4.2	253	68.0	64	48.4	19.5 **	186	60.8	32	46.9	13.9
Second institutional shareholder's equity, %	461	2.9	141	1.6	1.3 **	253	2.8	64	1.9	1.0	186	3.3	32	2.1	1.2
Second institutional shareholder, %	461	39.7	141	30.5	9.2 *	253	35.6	64	37.5	-1.9	186	41.9	32	50.0	-8.1
Cash flow volatility, %	461	4.4	141	10.6	-6.2 ***	253	5.2	64	9.7	-4.5 *	186	3.4	32	3.4	0.0

Table 4 – *Descriptive statistics of hedgers and non-hedgers for subsamples of family firms*. This table reports the descriptive statistics of selected variables (underdiversification, information asymmetry, and corporate governance attributes) for hedgers and non-hedgers, for the subsample of family firms (602 firm-year observations), family firms with a family CEO (317 firm-year observations), and family firms with a founding-family CEO (218 firm-year observations). Variables are defined as in Table A1. ***, **, *, denote statistical significance of mean differences at the 1, 5, and 10% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
(1) *Log sales*	1															
(2) *ROA*	0.144***	1														
(3) *Leverage*	0.012	-0.379***	1													
(4) *Cash*	-0.080**	0.225***	-0.161***	1												
(5) *Dividend-paying*	0.292***	0.460***	-0.237***	0.148***	1											
(6) *Tobin's Q*	-0.008	0.494***	-0.174***	0.173***	0.191***	1										
(7) *Family*	-0.173***	0.124***	0.072**	0.060*	-0.033	0.165***	1									
(8) *Family CEO*	-0.129***	0.046	-0.007	-0.041	-0.092***	0.090***	0.496***	1								
(9) *Non-family CEO*	-0.035	0.073**	0.077**	0.099***	0.062*	0.066*	0.456***	-0.547***	1							
(10) *Family CEO, founding family*	-0.070**	0.106***	-0.081**	-0.016	-0.002	0.145***	0.377***	0.762***	-0.416***	1						
(11) *Family CEO, non-founding family*	-0.098***	-0.076**	0.098***	-0.04	-0.136***	-0.062*	0.233***	0.471***	-0.257***	-0.213***	1					
(12) *Founder CEO*	-0.138***	0.102***	0.005	-0.014	0.021	0.137***	0.194***	0.392***	-0.214***	0.514***	-0.109***	1				
(13) *Heir CEO*	0.019	0.048	-0.097***	-0.008	-0.017	0.067**	0.294***	0.593***	-0.324***	0.779***	-0.166***	-0.138***	1			
(14) *Log CEO age*	0.098***	0.032	0.049	-0.017	0.035	-0.055	-0.098***	-0.065*	-0.028	-0.087**	0.02	0.166***	-0.222***	1		
(15) *CEO male*	0.045	0.144***	0.110***	-0.054	0.152***	0.046	0.096***	0.052	0.039	0.057*	0.001	0.054	0.027	0.072**	1	
(16) *CEO high tenure*	-0.023	0.126***	-0.068**	-0.025	0.059*	0.017	0.095***	0.193***	-0.106***	0.162***	0.070**	0.107***	0.109***	0.289***	0.164***	1
(17) *CEO master/PhD*	0.02	-0.053	0.027	0.124***	0.032	-0.060*	-0.065*	-0.137***	0.078**	-0.072**	-0.108***	0.124***	-0.174***	-0.214***	0.077**	-0.025
(18) *CEO degree business/economics*	0.142***	-0.137***	0.117***	-0.132***	-0.048	-0.121***	-0.01	-0.086**	0.079**	-0.075**	-0.028	-0.117***	0	-0.198***	-0.077**	-0.071**
(19) *CEO experience*	0.008	-0.129***	0.117***	-0.018	-0.051	-0.132***	-0.052	-0.108***	0.061*	-0.074**	-0.063*	-0.116***	0	-0.160***	-0.054	-0.112***
(20) *High concentration*	-0.137***	0.057*	0.016	0.044	0.016	0.100***	0.365***	0.235***	0.111***	0.209***	0.069**	0.131***	0.146***	-0.124***	0	-0.041
(21) *OC separation*	0.278***	0.016	0.031	-0.036	0.052	-0.106***	-0.002	0.090***	-0.094***	-0.045	0.197***	-0.057*	-0.01	0.016	0.012	-0.042
(22) *Turnover*	0.036	-0.038	-0.074**	0.161***	-0.104***	0.006	-0.191***	-0.181***	0.001	-0.147***	-0.072**	-0.079**	-0.112***	-0.012	0.034	-0.047
(23) *Bid-ask spread*	-0.396***	-0.199***	0.102***	-0.120***	-0.270***	-0.211***	0.100***	0.104***	-0.01	0.090***	0.034	0.051	0.066*	-0.057*	0.016	0.039
(24) *Amihud's illiquidity*	-0.747***	-0.305***	0.095***	-0.059*	-0.340***	-0.296***	0.149***	0.180***	-0.041	0.116***	0.114***	0.085**	0.071**	-0.043	-0.035	0.052
(25) *Number of analysts*	0.738***	0.280***	-0.144***	-0.008	0.321***	0.251***	-0.100***	-0.171***	0.079**	-0.068**	-0.166***	-0.083**	-0.018	0.057*	0.005	-0.035
(26) *Board size*	0.519***	0.170***	-0.082**	0.051	0.282***	0.085**	0.079**	-0.093***	0.171***	-0.055*	-0.065*	-0.108***	0.015	0.072**	-0.032	-0.022
(27) *Highly independent board*	0.340***	-0.067*	0.100***	-0.080**	-0.023	-0.047	-0.206***	-0.170***	-0.025	-0.118***	-0.096***	-0.012	-0.127***	0.106***	0.011	-0.061*
(28) *Directors from minority list*	0.289***	-0.074**	0.056*	-0.092***	0.100***	-0.014	-0.290***	-0.267***	-0.006	-0.233***	-0.085**	-0.132***	-0.172***	0.019	-0.064*	-0.172***
(29) *CEO duality*	-0.330***	0.018	0.003	-0.045	-0.101***	-0.006	0.099***	0.444***	-0.360***	0.273***	0.298***	0.311***	0.088**	0.161***	0.106***	0.272***
(30) *Second institutional shareholder*	0.139***	0.074**	-0.069**	-0.056*	0.102***	0.067*	0.04	-0.006	0.044	0.083**	-0.122***	-0.007	0.101***	-0.106***	-0.008	-0.002
(31) *Cash flow volatility*	-0.227***	-0.218***	0.137***	0.087**	-0.206***	-0.071**	-0.067*	-0.026	-0.038	-0.093***	0.087**	-0.051	-0.071**	-0.016	-0.007	-0.043

	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
(17) *CEO master/PhD*	1														
(18) *CEO degree business/economics*	0.055	1													
(19) *CEO experience*	0.090***	0.377***	1												
(20) *High concentration*	-0.045	-0.039	-0.176***	1											
(21) *OC separation*	0.001	0.167***	0.092***	0.002	1										
(22) *Turnover*	0.063*	-0.057*	-0.038	-0.236***	-0.019	1									
(23) *Bid-ask spread*	0	0.003	-0.021	0.097***	-0.145***	-0.163***	1								
(24) *Amihud's illiquidity*	-0.064*	-0.041	0.02	0.203***	-0.232***	-0.280***	0.598***	1							
(25) *Number of analysts*	0.026	0.046	-0.073**	-0.151***	0.214***	0.206***	-0.458***	-0.864***	1						
(26) *Board size*	0.009	0.016	0.088**	-0.036	0.136***	-0.017	-0.361***	-0.519***	0.500***	1					
(27) *Highly independent board*	-0.015	0.055	0.062*	-0.154***	0.071**	0.044	-0.096***	-0.281***	0.310***	0.038	1				
(28) *Directors from minority list*	0.115***	0.005	0.079**	-0.257***	0.039	0.076**	-0.254***	-0.330***	0.299***	0.188***	0.212***	1			
(29) *CEO duality*	-0.129***	-0.116***	-0.138***	0.090***	-0.064*	-0.093***	0.182***	0.346***	-0.323***	-0.276***	-0.232***	-0.314***	1		
(30) *Second institutional shareholder*	-0.063*	0.084**	0.110***	0.090***	-0.011	-0.033	-0.019	-0.143***	0.232***	0.119***	0.019	0.031	-0.042	1	
(31) *Cash flow volatility*	0.122***	0.059*	0.218***	-0.031	0.063*	0.102***	0.075**	0.144***	-0.198***	-0.066*	-0.088**	0.05	0.005	-0.088**	1

Table 5 – *Correlation table*. This table reports the pairwise correlation coefficients of the variables we use in the multivariate analyses. Variables are defined as in Table A1. ***, **, *, denote statistical significance at the 1, 5, and 10% level, respectively.

	Model 1	Model 2	Model 3	Model 4
Log sales	0.0745***	0.0748***	0.0749***	0.0771***
	(0.0156)	(0.0158)	(0.0158)	(0.0158)
ROA	0.149	0.162	0.142	0.103
	(0.441)	(0.444)	(0.434)	(0.427)
Leverage	0.0409	0.0577	0.0703	0.0563
	(0.0869)	(0.0895)	(0.0879)	(0.0860)
Cash	0.0371	0.0864	0.0885	0.110
	(0.322)	(0.316)	(0.318)	(0.318)
Dividend-paying	0.00629	0.0161	0.00777	0.00440
	(0.0444)	(0.0464)	(0.0454)	(0.0455)
Tobin's Q	0.00744	0.00576	0.00288	0.00139
	(0.0163)	(0.0166)	(0.0165)	(0.0160)
Family	0.0625			
	(0.0518)			
Family CEO		0.102*		
		(0.0599)		
Family CEO, founding-family			0.151**	
			(0.0644)	
Founder CEO				0.248***
				(0.0859)
Heir CEO				0.106
				(0.0655)
Family CEO, non-founding-family			-0.00211	0.000148
			(0.0815)	(0.0815)
Non-family CEO		0.0143	0.0175	0.0188
		(0.0597)	(0.0597)	(0.0592)
Constant	-0.279	-0.302	-0.264	-0.283
	(0.244)	(0.242)	(0.254)	(0.252)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.188	0.195	0.204	0.210

Table 6 – *Determinants of hedging.* This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. Variables are defined in Table A1. Year and industry fixed effects are included in all models. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

	Model 1	Model 2	Model 3
Family CEO	-0.00490		
	(0.0903)		
Family CEO, founding-family		0.0471	
		(0.110)	
Family CEO, non-founding-family		-0.103	-0.100
		(0.122)	(0.121)
Founder CEO			0.00397
			(0.179)
Heir CEO			0.0635
			(0.104)
Non-family CEO	-0.00803	-0.00656	-0.00395
	(0.0685)	(0.0685)	(0.0688)
CEO high tenure	-0.124*	-0.128*	-0.121
	(0.0736)	(0.0734)	(0.0738)
Family CEO × CEO high tenure	0.222**		
	(0.101)		
Family CEO, founding-family × CEO High tenure		0.213*	
		(0.116)	
Family CEO, non-founding-family × CEO High tenure		0.224	0.216
		(0.139)	(0.139)
Founder CEO × CEO High tenure			0.356*
			(0.189)
Heir CEO × CEO High tenure			0.137
			(0.110)
Non-family CEO × CEO high tenure	0.0298	0.0374	0.0344
	(0.0953)	(0.0956)	(0.0955)
Log CEO age	0.206	0.213	0.177
	(0.144)	(0.151)	(0.156)
CEO male	-0.0381	-0.0410	-0.0352
	(0.0930)	(0.0954)	(0.0971)
CEO degree business/economics	0.0335	0.0338	0.0278
	(0.0480)	(0.0470)	(0.0468)
CEO master/PhD	0.0973*	0.0909	0.0672
	(0.0579)	(0.0572)	(0.0634)
CEO experience	-0.0204	-0.0280	-0.0143
	(0.0600)	(0.0573)	(0.0578)
Constant	-1.019	-1.006	-0.900
	(0.636)	(0.650)	(0.653)
Firm-level controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	851	851	851
R-squared	0.215	0.222	0.227

Table 7 – *Determinants of hedging, interactions with CEO tenure.* This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger, including CEO characteristics and interactions between family CEO variables and *CEO high tenure*. Variables are defined in Table A1. Firm-level controls are included in all models, as well as year and industry fixed effects. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

Panel A – Hedging and High concentration	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	0.0497			
	(0.0553)			
Family CEO		0.118*		
		(0.0696)		
Family CEO, founding-family			0.237***	
			(0.0635)	
Founder CEO				0.296***
				(0.107)
Heir CEO				0.209***
				(0.0633)
Family CEO, non-founding-family			-0.0866	-0.0799
			(0.0904)	(0.0914)
Non-family CEO		-0.0228	-0.0195	-0.0193
		(0.0677)	(0.0667)	(0.0668)
High concentration	-0.151	-0.175	-0.190*	-0.188*
	(0.111)	(0.110)	(0.112)	(0.112)
Family × *High concentration*	0.109			
	(0.123)			
Family CEO × *High concentration*		0.113		
		(0.134)		
Family CEO, founding-family × *High concentration*			0.0304	
			(0.133)	
Family CEO, non-founding-family × *High concentration*			0.284	0.268
			(0.181)	(0.181)
Founder CEO × *High concentration*				0.0357
				(0.177)
Heir CEO × *High concentration*				0.0194
				(0.134)
Non-family CEO × *High concentration*		0.161	0.177	0.177
		(0.133)	(0.134)	(0.134)
Constant	-0.177	-0.851	-1.044	-0.830
	(0.260)	(0.664)	(0.670)	(0.683)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.195	0.212	0.227	0.230
Panel B – Hedging and OC separation	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	0.117*			
	(0.0610)			
Family CEO		0.178**		
		(0.0763)		
Family CEO, founding-family			0.220***	
			(0.0784)	
Founder CEO				0.283**
				(0.110)
Heir CEO				0.184**
				(0.0758)
Family CEO, non-founding-family			0.0189	0.0139
			(0.115)	(0.115)
Non-family CEO		0.0658	0.0659	0.0661

		(0.0632)	(0.0637)	(0.0639)
OC separation	0.101	0.101	0.109	0.100
	(0.0821)	(0.0829)	(0.0830)	(0.0835)
Family × OC separation	-0.221*			
	(0.114)			
Family CEO × OC separation		-0.219*		
		(0.131)		
Family CEO, founding-family × OC separation			-0.268*	
			(0.148)	
Family CEO, non-founding-family × OC separation			-0.0804	-0.0666
			(0.192)	(0.191)
Founder CEO × OC separation				-0.278**
				(0.139)
Heir CEO × OC separation				-0.248
				(0.163)
Non-family CEO × OC separation		-0.279**	-0.293**	-0.288**
		(0.133)	(0.133)	(0.133)
Constant	-0.812	-1.030	-0.839	-0.650
	(0.639)	(0.636)	(0.675)	(0.705)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.204	0.216	0.226	0.228

Table 8 – *Hedging and underdiversification.* This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. Panel A includes a dummy variable for closely-held firms (*High concentration*) and interactions between family and family CEO variables and *High concentration*. Panel B includes a dummy variable for firms with a positive wedge between ownership and control (*OC separation*) and interactions between family and family CEO variables and *OC separation*. Variables are defined in Table A1. Firm-level controls are included in all models, as well as year and industry fixed effects. CEO-level controls are included in models 2 through 4 in both panels. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

Panel A – Hedging and Bid-ask spread	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	-0.0312			
	(0.0656)			
Family CEO		-0.00006		
		(0.0802)		
Family CEO, founding-family			0.0491	
			(0.0871)	
Founder CEO				0.0477
				(0.121)
Heir CEO				0.0519
				(0.0840)
Family CEO, non-founding-family			-0.103	-0.103
			(0.108)	(0.107)
Non-family CEO		-0.0628	-0.0596	-0.0609
		(0.0758)	(0.0755)	(0.0756)
Bid-ask spread	-5.504*	-5.998**	-6.165**	-6.048*
	(3.130)	(2.959)	(3.008)	(3.079)
Family × Bid-ask spread	7.701**			
	(3.195)			
Family CEO × Bid-ask spread		9.154***		
		(3.230)		
Family CEO, founding-family × Bid-ask spread			9.098***	
			(3.472)	
Family CEO, non-founding-family × Bid-ask spread			9.234**	9.092**
			(3.632)	(3.690)
Founder CEO × Bid-ask spread				12.64***
				(3.475)
Heir CEO × Bid-ask spread				6.930*
				(4.013)
Non-family CEO × Bid-ask spread		6.241*	6.311*	6.288
		(3.764)	(3.787)	(3.837)
Constant	-0.183	-0.937	-0.911	-0.712
	(0.295)	(0.652)	(0.658)	(0.675)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.202	0.220	0.229	0.233
Panel B – Hedging and Amihud's illiquidity	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	0.142*			
	(0.0752)			
Family CEO		0.220***		
		(0.0817)		
Family CEO, founding-family			0.255***	
			(0.0920)	
Founder CEO				0.356***
				(0.0974)
Heir CEO				0.190*
				(0.112)
Family CEO, non-founding-family			0.163*	0.160*
			(0.0966)	(0.0963)
Non-family CEO		0.0833	0.0840	0.0847

		(0.0866)	(0.0871)	(0.0874)
Log Amihud's illiquidity	-0.0193	-0.0214	-0.0239	-0.0232
	(0.0164)	(0.0158)	(0.0158)	(0.0160)
Family × Log Amihud's illiquidity	0.0237*			
	(0.0139)			
Family CEO × Log Amihud's illiquidity		0.0322*		
		(0.0173)		
Family CEO, founding-family × Log Amihud's illiquidity			0.0263	
			(0.0186)	
Family CEO, non-founding-family × Log Amihud's illiquidity			0.0570**	0.0558*
			(0.0284)	(0.0289)
Founder CEO × Log Amihud's illiquidity				0.0501***
				(0.0163)
Heir CEO × Log Amihud's illiquidity				0.0112
				(0.0243)
Non-family CEO × Log Amihud's illiquidity		0.0208	0.0202	0.0210
		(0.0171)	(0.0169)	(0.0171)
Constant	-0.274	-1.087	-1.122*	-0.996
	(0.331)	(0.676)	(0.677)	(0.693)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.194	0.211	0.223	0.227
Panel C – Hedging and Number of analysts	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	0.169*			
	(0.0881)			
Family CEO		0.261***		
		(0.0959)		
Family CEO, founding-family			0.339***	
			(0.106)	
Founder CEO				0.448***
				(0.103)
Heir CEO				0.250*
				(0.138)
Family CEO, non-founding-family			0.147	0.142
			(0.107)	(0.107)
Non-family CEO		0.0933	0.0942	0.0951
		(0.107)	(0.108)	(0.109)
Log (1 + number of analysts)	0.0849**	0.0939**	0.0994**	0.0979**
	(0.0384)	(0.0377)	(0.0382)	(0.0388)
Family × Log (1 + number of analysts)	-0.0660*			
	(0.0372)			
Family CEO × Log (1 + number of analysts)		-0.0911**		
		(0.0425)		
Family CEO, founding-family × Log (1 + number of analysts)			-0.107**	
			(0.0442)	
Family CEO, non-founding-family × Log (1 + number of analysts)			-0.0882	-0.0856
			(0.0674)	(0.0687)
Founder CEO × Log (1 + number of analysts)				-0.161***
				(0.0471)
Heir CEO × Log (1 + number of analysts)				-0.0644
				(0.0585)

Non-family CEO × Log (1 + number of analysts)		-0.0538	-0.0518	-0.0535
		(0.0476)	(0.0475)	(0.0482)
Constant	-0.155	-0.921	-0.896	-0.757
	(0.300)	(0.682)	(0.696)	(0.705)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.196	0.214	0.225	0.229

Table 9 – *Hedging and information asymmetry.* This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. Panel A includes a variable for the bid-ask spread (*Bid-ask spread*) and interactions between family and family CEO variables and *Bid-ask spread*. Panel B includes a variable for Amihud's illiquidity measure (*Log Amihud's illiquidity*) and interactions between family and family CEO variables and *Log Amihud's illiquidity*. Panel C includes a variable for the number of analysts covering the firm's stocks, i.e. *Log (1 + Number of analysts)* and interactions between family and family CEO variables and *Log (1 + Number of analysts)*. Variables are defined in Table A1. Firm-level controls are included in all models, as well as year and industry fixed effects. CEO-level controls are included in models 2 through 4 in all panels. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

Hedging and CEO duality	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	0.0269			
	(0.0687)			
Family CEO		0.00387		
		(0.0957)		
Family CEO, founding-family			0.0938	
			(0.0993)	
Founder CEO				0.0780
				(0.108)
Heir CEO				0.0914
				(0.105)
Family CEO, non-founding-family			-0.341***	-0.344***
			(0.122)	(0.123)
Non-family CEO		0.0324	0.0258	0.0246
		(0.0709)	(0.0705)	(0.0707)
Ln board size	-0.0962	-0.0717	-0.0494	-0.0390
	(0.122)	(0.126)	(0.125)	(0.125)
CEO duality	-0.0898	-0.0977	-0.104	-0.100
	(0.0922)	(0.0900)	(0.0898)	(0.0909)
Family × CEO duality	0.161*			
	(0.0941)			
Family CEO × CEO duality		0.243**		
		(0.108)		
Family CEO, founding-family × CEO duality			0.184*	
			(0.105)	
Family CEO, non-founding-family × CEO duality			0.540***	0.538***
			(0.158)	(0.159)
Founder CEO × CEO duality				0.239*
				(0.143)
Heir CEO × CEO duality				0.145
				(0.107)
Non-family CEO × CEO duality		-0.183	-0.172	-0.174
		(0.192)	(0.190)	(0.192)
Constant	-0.698	-0.669	-0.743	-0.654
	(0.644)	(0.636)	(0.600)	(0.607)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.203	0.229	0.251	0.252

Table 10 – *Hedging and CEO duality.* This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. Covariates include a dummy variable that takes the value of 1 if the CEO is also the chair of the board (*CEO duality*), the size of the board (*Log board size*), and interactions between family and family CEO variables and *CEO duality*. Variables are defined in Table A1. Firm-level controls are included in all models, as well as year and industry fixed effects. CEO-level controls are included in models 2 through 4. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

Cash flow volatility	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	0.0353			
	(0.0521)			
Family CEO		0.0432		
		(0.0485)		
Family CEO, founding-family			-0.00315	
			(0.0443)	
Founder CEO				-0.0269
				(0.0633)
Heir CEO				0.00536
				(0.0453)
Family CEO, non-founding-family			0.0883	0.0889
			(0.0578)	(0.0576)
Non-family CEO		0.0271	0.0268	0.0276
		(0.0639)	(0.0642)	(0.0638)
Hedging	0.0562	0.0532	0.0530	0.0537
	(0.0505)	(0.0483)	(0.0482)	(0.0487)
Family × *Hedging*	-0.0799*			
	(0.0464)			
Family CEO × *Hedging*		-0.0723*		
		(0.0414)		
Family CEO, founding-family × *Hedging*			-0.0369	
			(0.0413)	
Family CEO, non-founding-family × *Hedging*			-0.0863	-0.0862
			(0.0521)	(0.0526)
Founder CEO × *Hedging*				-0.0321
				(0.0538)
Heir CEO × *Hedging*				-0.0347
				(0.0407)
Non-family CEO × *Hedging*		-0.0879	-0.0890	-0.0902
		(0.0609)	(0.0612)	(0.0616)
Constant	0.133	0.0728	0.0795	0.0191
	(0.378)	(0.408)	(0.400)	(0.448)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	851	851	851	851
R-squared	0.227	0.230	0.235	0.236

Table 11 – *Hedging and cash flow volatility.* This table reports the coefficients of a linear regression for *Cash flow volatility*. Covariates include family and family CEO variables, a dummy variable that takes the value of 1 if the firm is a hedger (*Hedging*), and interactions between family and family CEO variables and *Hedging*. Variables are defined in Table A1. Firm-level controls are included in all models, as well as year and industry fixed effects. CEO-level controls are included in models 2 through 4. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

Panel A – Family firms		**Model 1**	**Model 2**	**Model 3**
Family CEO		0.0953		
		(0.0667)		
Family CEO, founding family			0.206**	
			(0.0829)	
Founder CEO				0.233**
				(0.105)
Constant		-0.994	0.661	0.436
		(0.824)	(0.932)	(1.148)
Firm-level controls		Yes	Yes	Yes
CEO-level controls		Yes	Yes	Yes
Year fixed effects		Yes	Yes	Yes
Industry fixed effects		Yes	Yes	Yes
Observations		602	317	218
R-squared		0.187	0.270	0.343
Panel B – Excluding largest firms	**Model 1**	**Model 2**	**Model 3**	**Model 4**
Family	0.0771			
	(0.0698)			
Family CEO		0.154*		
		(0.0855)		
Family CEO, founding family			0.197**	
			(0.0965)	
Founder CEO				0.278**
				(0.126)
Heir CEO				0.150
				(0.0982)
Family CEO, non-founding family			0.0728	0.0680
			(0.100)	(0.0982)
Non-family CEO		0.0234	0.0279	0.0279
		(0.0779)	(0.0790)	(0.0789)
Constant	-0.414	-1.376	-1.320	-1.059
	(0.343)	(0.879)	(0.891)	(0.851)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	638	638	638	638
R-squared	0.167	0.191	0.197	0.201

Table 12 – *Determinants of hedging, analyses by subsamples*. This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. Model 1 of panel A uses the subsample of family firms. Model 2 of panel A uses the subsample of family firms run by a family CEO. Model 3 of panel A uses the subsample of family firms run by a CEO belonging to the founding family. The sample excludes the largest firms (i.e., one-quarter of the total observations by *Sales*) in panel B. Firm-level controls are included in all models, as well as year and industry fixed effects. CEO-level controls are included in all models of panel A, and in models 2 through 4 of panel B. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

	Model 1	Model 2	Model 3	Model 4
Family	0.0550			
	(0.0466)			
Family CEO		0.107*		
		(0.0621)		
Family CEO, founding family			0.163**	
			(0.0750)	
Founder CEO				0.234*
				(0.122)
Heir CEO				0.123
				(0.0772)
Family CEO, non-founding family			0.0104	0.00709
			(0.0772)	(0.0753)
Non-family CEO		0.00548	0.00899	0.00864
		(0.0534)	(0.0535)	(0.0534)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	815	815	815	815
Pseudo R-squared	0.166	0.179	0.188	0.190

Table 13 – *Determinants of hedging, logit regressions.* This table reports the average marginal effects of a logit regression for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. Firm-level controls are included in all models, as well as year and industry fixed effects. CEO-level controls are included in models 2 through 4. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

	Model 1	Model 2	Model 3	Model 4
Family	0.0636			
	(0.0626)			
Family CEO		0.100		
		(0.0671)		
Family CEO, founding family			0.182*	
			(0.0933)	
Founder CEO				0.290**
				(0.118)
Firm-level controls	Yes	Yes	Yes	Yes
CEO-level controls	No	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	498	570	198	142
Treated	249	285	99	71
Untreated	249	285	99	71
R-squared	0.168	0.189	0.354	0.399

Table 14 – *Determinants of hedging, propensity-score matched samples.* This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. Each model employs a sample composed of an equal number of treated and untreated observations, based on the nearest-neighbor propensity score matching methodology without replacement (Rosenbaum and Rubin, 1983; Imbens, 2004). Variables used for matching are firm-specific attributes (*Log sales*, *ROA*, *Leverage*, *Cash*, *Dividend-paying*, and *Tobin's Q*) in all models, and CEO-specific attributes (*Log CEO age*, *CEO male*, *CEO high tenure*, *CEO degree business/economics*, *CEO master/PhD*, and *CEO experience*), in models 2 through 4. Model 1 contrasts family firms (treated) and matched non-family firms (untreated). The sample used in Model 2 is only composed of family firms, and the model contrasts firms led by a family CEO (treated) to matched firms without a family CEO, i.e., family firms with a professional CEO (untreated). The sample used in Model 3 is only composed of family firms led by a family CEO, and the model contrasts firms led by a founding-family CEO (treated) to matched firms led by a CEO not belonging to the founding family (untreated). The sample used in Model 4 is only composed of family firms led by a CEO belonging to the founding family, and the model contrasts firms led by a founder CEO (treated) to matched family firms without a founder CEO, i.e., led by an heir CEO (untreated). Year fixed effects are included in all models. CEO-level controls are included in models 2 through 4. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

		To hedge	To not hedge	Hedging unchanged
	N	**N**	**N**	**N**
Change family = +1	7	0	0	7
Change family = -1	3	0	2	1
Change family = 0	677	45	51	581
Change family CEO = +1	11	4	1	6
Change family CEO = -1	12	0	5	7
Change family CEO = 0	664	41	47	576
Change founding family CEO = +1	6	3	0	3
Change founding family CEO = -1	7	0	3	4
Change founding family CEO = 0	674	42	50	582
Change founder CEO = +1	1	0	0	1
Change founder CEO = -1	2	0	0	2
Change founder CEO = 0	684	45	53	586

Table 15 – *Family status and family CEO changes*. This table reports the number of changes in the family firm status, changes in family CEO, change in founding family CEO, and change in founder CEO in our sample, and the resulting hedging policy (from non-hedging to hedging, from hedging to non-hedging, and hedging unchanged). *Change family* = +1 (-1) identifies a change in the firm's family status from non-family to family (from family to non-family). *Change family CEO* = +1 (-1) identifies a non-family CEO replaced by a family CEO (a family CEO replaced by a non-family CEO). The same logic applies to *Change founding family CEO* and *Change founder CEO*. A zero change in the abovementioned variables means that there is no change in the relative variable.

Panel A – Linear probability	**Model 1** **To hedging**	**Model 2** **To hedging**	**Model 3** **To hedging**	**Model 4** **To not hedging**	**Model 5** **To not hedging**	**Model 6** **To not hedging**
Change family	-0.0125			-0.248**		
	(0.0265)			(0.110)		
Change family CEO		0.192*			-0.182*	
		(0.107)			(0.0968)	
Change family CEO, founding family			0.250*			-0.229**
			(0.149)			(0.109)
Firm-level control variables	Yes	Yes	Yes	Yes	Yes	Yes
Change in CEO characteristics	No	Yes	Yes	No	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	687	687	687	687	687	687
R-squared	0.028	0.048	0.048	0.054	0.059	0.059
Panel B – OLS and ordered logit	**Model 1** **OLS**	**Model 2** **OLS**	**Model 3** **OLS**	**Model 4** **OLogit**	**Model 5** **Ologit**	**Model 6** **Ologit**
Change family	0.226**			1.482***		
	(0.106)			(0.522)		
Change family CEO		0.374**			2.303***	
		(0.189)			(0.876)	
Change family CEO, founding family			0.479*			2.672***
			(0.244)			(0.996)
Firm-level control variables	Yes	Yes	Yes	Yes	Yes	Yes
Change in CEO characteristics	No	Yes	Yes	No	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	687	687	687	687	687	687
R-squared/Pseudo R-squared	0.021	0.045	0.045	0.021	0.042	0.040

Table 16 – *Determinants of a change in hedging*. This table reports the coefficients of a linear probability model for the change in the hedging policy (panel A), and the coefficients of an OLS (panel B, first three models) and ordered logit (panel B, last three models) for the change in the hedging policy. In models 1 through 3 of panel A, the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger, but it did not hedge the year before ("to hedging"). In models 4 through 6 of panel A, the dependent variable is a dummy variable that takes the value of 1 if the firm is not a hedger, but it did hedge the year before ("to not hedging"). In panel B, the dependent variable takes the value of –1, 0, or +1, depending on whether the firm passes from hedging to non-hedging, keeps its hedging policy unaltered, or passes from non-hedging to hedging, respectively. Firm-level controls are included in all models, as well as year and industry fixed effects. Change in CEO-level controls are included in models 2, 3, 5, and 6 in both panels. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

	Model 1	Model 2	Model 3
Family	0.337*		
	(0.171)		
Family CEO		0.377*	
		(0.196)	
Family CEO, founding family			0.467*
			(0.231)
Family CEO, non-founding family			0.175
			(0.203)
Non-family CEO		0.266	0.234
		(0.199)	(0.205)
Firm-level controls	Yes	Yes	Yes
CEO-level controls	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Observations	131	131	131
R-squared	0.544	0.551	0.566

Table 17 – *Determinants of hedging, subsample of firms with a change in family CEO.* This table reports the coefficients of a linear probability model for hedging, i.e., the dependent variable is a dummy variable that takes the value of 1 if the firm is a hedger. The sample is restricted to firms experiencing a change of family CEO (16 firms, 131 firm-year observations). Firm-level and CEO-level controls are included in all models, as well as year and industry fixed effects. Heteroskedasticity-robust standard errors clustered at the firm level are reported in parentheses. ***, **, * indicate statistical significance at the 1, 5, and 10% level, respectively.

Appendix A – Definition of variables

Variable	Definition	Source
Sales	Net sales	Refinitiv Eikon
ROA	Ratio between EBIT and total assets	Refinitiv Eikon
Leverage	Ratio between total net debt and the sum of total net debt and equity	Refinitiv Eikon
Cash	Ratio between cash and cash equivalents and total assets	Refinitiv Eikon
Dividend-paying	Dummy variable that takes the value of 1 if the firm pays a cash dividend	Refinitiv Eikon
Tobin's Q	Sum of market capitalization and total debt over the sum of book value of equity and total debt	Refinitiv Eikon
Family	Dummy variable that takes the value of 1 if the firm is family-controlled (based on a threshold of 20% of the equity capital)	CONSOB
Family CEO (*Non-family CEO*)	Dummy variable that takes the value of 1 if the firm is family-controlled and the CEO is (is not) a member of the controlling family	CONSOB
Family CEO, founding family (*Family CEO, non-founding family*)	Dummy variable that takes the value of 1 if the firm is family-controlled and the CEO is (is not) a member of the founding family	CONSOB
Founder CEO (*Heir CEO*)	Dummy variable that takes the value of 1 if the firm is family-controlled and the CEO is the founder (is an heir of the founder)	CONSOB
CEO age	Age of the CEO	CEOs' resume and biographical sketches from Refinitiv Eikon and LinkedIn
CEO male	Dummy variable that takes the value of 1 if the CEO's gender is male	CEOs' resume and biographical sketches from Refinitiv Eikon and LinkedIn
CEO tenure	Tenure of the CEO (current year minus year of appointment)	CONSOB
CEO high tenure	Dummy variable that takes the value of 1 if the tenure is higher than the median figure in our sample (6 years)	CONSOB
CEO master/PhD	Dummy variable that takes the value of 1 if the CEO has reached advanced higher education (master/PhD)	CEOs' resume and biographical sketches from Refinitiv Eikon and LinkedIn

CEO degree business/economics	Dummy variable that takes the value of 1 if the CEO has graduated in business or economics	CEOs' resume and biographical sketches from Refinitiv Eikon and LinkedIn
CEO experience	Dummy variable that takes the value of 1 if the CEO has past experience in banking or investment firms, large auditing firms, or finance-related roles	CEOs' resume and biographical sketches from Refinitiv Eikon and LinkedIn
First shareholder's equity	Voting capital of the first shareholder	CONSOB
High concentration	Dummy variable that takes the value of 1 if the voting capital of the first shareholder is higher than the median value in our sample, i.e. 54.3%.	CONSOB
OC difference	Difference between voting rights and cash flow rights of the ultimate shareholder based on a 20% threshold of the voting capital	CONSOB, AIDA and reports from the Chamber of Commerce
OC separation	Dummy variable that takes the value of 1 if there is a difference between voting rights and cash flow rights, i.e. *OC difference* is greater than 0	CONSOB, AIDA and reports from the Chamber of Commerce
Turnover	Annual average ratio between the monthly number of shares traded and the number of shares outstanding	Refinitiv Eikon
Bid-ask spread	Annual average ratio between the monthly bid-ask spread divided by the price midquote	Refinitiv Eikon
Amihud's illiquidity	Amihud's (2002) illiquidity measure (ILLIQ), i.e. annual average ratio between absolute daily returns and value of all daily trades (multiplied by 10^6)	Refinitiv Eikon
Number of analysts	Number of analysts covering the firm's stocks	Refinitiv Eikon
Board size	Number of a firm’s directors	CONSOB
Independent directors	Fraction of independent directors over total number of board directors	Annual corporate governance reports, Italian Stock Exchange
Highly independent board	Dummy variable that takes the value of 1 if the fraction of independent directors is higher than the third quartile of the annual distribution	Annual corporate governance reports, Italian Stock Exchange
Directors from minority list	Dummy variable that takes the value of 1 if the board of directors comprises at least one director elected from a list presented by minority shareholders	Annual corporate governance reports, Italian Stock Exchange
CEO duality	Dummy variable that takes the value of 1 if the CEO is also the chair of the board of directors	CONSOB
Second institutional shareholder's equity	Voting capital of the second shareholder if institutional	CONSOB

Second institutional shareholder	Dummy variable that takes the value of 1 if the second shareholder is an institutional investor	CONSOB
Cash flow volatility	Annual standard deviation of operating cash flows over net sales	Refinitiv Eikon

Table A1 – *Definition of variables.* The table describes the variables used in this study and the data source.