



Board gender diversity and cash holding: the effect of family ties

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Abstract

Using a sample of 630 firm-year observations of non-financial Spanish listed companies for the period 2004–2020, this study examines linkages of family and non-family female directors and cash holding. We show that family and non-family female directors affect cash holdings differently. When the presence of family female directors is scarce, their role is eclipsed, thereby encouraging actions related to family goals and increasing cash holdings. However, when the presence of family female directors reaches a critical mass, the cohesion between the interests of the dominant family and external investors increases, thereby reducing the level of cash holdings. When the number of non-family female directors is low, the cash level of family firms is reduced, suggesting that non-family female directors encourage the family firm's cash reduction as a result of their greater capacity to control and their orientation towards an effective corporate governance system. This cash-decreasing effect will occur even if the number of non-family female directors is low, since the purpose of appointing non-family female directors is less likely to be symbolic. In addition, non-family female directors are concerned about threats to reputational capital, such that reducing cash holdings would promote their reputation as credible supervisors, protect their current appointments, and also boost the likelihood of future appointments. However, the presence of a critical mass of non-family female directors becomes a sufficiently powerful instrument of control and legitimation for external investors, allowing for increased cash levels without increasing agency conflicts.

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1 Introduction

Companies worldwide are currently experiencing a crisis which is characterized—among other aspects—by high inflation, scarcity of raw materials as well as growing social and economic concern about unprecedented uncertainty that increases the risk to which firms are subject. In this context, understanding the drivers of cash levels in firms is increasingly relevant for the media, investors, market regulators, and society, as it directly affects investment and financing decisions as well as company sustainability.

Previous literature has identified different motivations for determining the level of cash, such as caution due to uncertainty, transaction costs, taxes or agency conflicts (Miller and Orr 1966; Jensen 1986; Opler et al. 1999; Foley et al. 2007; Tran 2020). Consequently, the relationship between corporate governance and cash holding has been the subject of considerable research (Khatib et al. 2022). Although family businesses dominate the business landscape (Family Business Index, Ernst and Young 2023), few studies have explored the relationship between family control and cash holding policies. As a result, research on cash holding in family firms remains far from conclusive. Ozkan and Ozkan (2004) show that family ownership is associated with higher cash holdings, since cash enables the dominant family to obtain private benefits, reduce capital market discipline and increase their likelihood of remaining in control of the company—thereby increasing agency conflicts with external investors. Using a sample of western European family firms, Durán et al. (2016) show that family control incentivises increased cash levels in order to support continued family control over the firm. Consistent with this result, studies by Kuan et al. (2011), Steijvers and Niskanen (2013), and Caprio et al. (2020) show that this effect is moderated by elements of corporate governance, such as ownership structure, board independence as well as the role and characteristics of the CEO.

Parallel to the interest in corporate cash holding policy in family firms, there has been increasing social, regulatory, and academic pressure to raise awareness of the role played by women on the board of directors. Although still far from the socially required level, the presence of female directors has increased sufficiently to encourage research on corporate decision-making based on gender differences (Croson and Gneezy 2009). Studies examining gender diversity and its effect on cash holding have produced mixed results. Zeng and Wang (2015), La Rocca et al. (2019), and Xu et al. (2019) show that the presence of female directors is associated with higher cash holdings as a consequence of women's greater risk aversion and their preference for preserving the firm's survival in the face of adverse scenarios. However, Atif et al. (2019) and Cambrea et al. (2020) find a negative relationship between the increase in female board members and cash holdings, in line with the more effective

control and lower tendency of female board members to engage in opportunistic practices.

However, research into the influence of female directors on the cash holding policy of family firms remains relatively scarce. Women have traditionally played an invisible role in family businesses in a way that has been associated more with the family than with the business side (Ward and Sorenson 1989; Martínez-Jiménez 2009; Calabró et al., 2023). However, this situation seems to have changed in recent years, with the active role played by women in family firms having increased (Amore et al. 2014; Bianco et al. 2015; Kubicek and Machek, 2019; Samara et al. 2019). According to the report “Women in leadership. The family business advantage” by Ernst and Young (2017), based on the results of a survey of 525 of the world’s largest family businesses in each of the top 21 global markets, 55% of family businesses have at least one woman on their board, with female directors accounting for an average of 16% of board seats. In addition, 70% of family firms are considering a woman for their next CEO.

Women’s ever-increasing prominence in family firms thus motivates research into what role they play in determining cash holding policies. In this context, family female directors may play a different role to family male directors because they may differ in aspects such as decision-making power and legitimacy (Calabró et al. 2023), the importance attributed to reputation and stakeholder demands (Akhmedova et al. 2020), or leadership style (Martínez-Jiménez 2009; Campopiano et al. 2017; Kubicek and Machek 2019; Bauweraerts et al. 2022). Moreover, female directors may have different capabilities and incentives depending on their affiliation to the firm (Rodríguez-Ariza et al. 2017; Poletti-Hughes and Briano-Turrent 2019; Cordeiro et al. 2020), which may lead to different effects on cash policies. Compared to female directors with family ties, non-family female directors place greater weight on the interests of the firm over family objectives (Cumming et al. 2015; Hoskisson 2017; Miller and Le Breton-Miller 2014; Cruz et al. 2019; Campopiano et al. 2019; Hillebrand et al. 2019; Herdhayinta et al. 2021). They also tend to have greater social capital, personal competence and legitimation (Cruz et al. 2019; Campopiano et al. 2019; González et al. 2020), added to which their appointment is usually based more on merit and ability (González et al. 2020; Herdhayinta et al. 2021). We shed light on this issue by examining the women director-cash holding relationship in family firms, using a sample of 630 firm-year observations of non-financial Spanish listed companies included in the OSIRIS (Bureau Van Dijk) database for the period 2004–2020. Spain is an interesting context in which to address these issues since—as in most continental European countries—it is characterized by a weak legal system in terms of protecting the interests of minority shareholders (La Porta et al. 1998; Djankov et al. 2008), which helps when studying differences between family and non-family female directors (Saeed and Sameer 2017). This is because in the presence of weak institutional environments, family firms find it easier to achieve family objectives—to the detriment of economic goals (Herdhayinta et al. 2021). In addition, Spain—like most European countries—is also characterized by a high concentration of ownership in the hands of dominant family owners. (La Porta et al. 1999; Faccio and Lang 2002, Sacristán-Navarro and Gómez-Anson 2007; Pindado et al. 2012; Bona-Sanchez et al. 2019). Together with strong

social and regulatory pressure, this has led to a significant increase in the number of female directors on company boards (Peña-Martel et al. 2022). We thus examine the role of female directors in addressing—through cash holding—the agency conflict between dominant family owners and external investors (Type II agency conflict), which is the main agency conflict in the continental European setting. Supporting Kanter's (1977) arguments, we show that the effect of female directors on cash holding in family firms depends on the number of women on the board. In addition, we show that family affiliation affects the incentives and interests of female directors, such that family and non-family female directors impact cash holdings differently. Accordingly, when the presence of family female directors is scarce, their role is eclipsed, thereby encouraging actions related to family goals and increasing cash holdings. However, when the presence of female directors with family ties to the dominant family reaches a critical mass, the cohesion between the interests of the dominant family and external investors increases, thereby reducing the level of cash holdings. On the other hand, when the number of non-family female directors does not reach a critical mass, the cash level of family firms is reduced, suggesting that non-family female directors encourage the family firm's cash reduction as a result of their greater capacity to control and their orientation towards an effective corporate governance system. This cash-decreasing effect will arise even if the number of non-family female directors is low, since tokenism is less likely to be the reason why female directors without family ties are appointed. Furthermore, non-family female directors are concerned about threats to reputational capital. By reducing cash holdings, non-family female directors promote their reputation as credible supervisors, which in turn protects the current board appointments of these non-family female directors and increases the likelihood of future appointments. However, the presence of a critical mass of non-family female directors becomes a sufficiently powerful control and legitimation instrument for external investors, allowing for increased cash levels without increasing agency conflicts. Our results are also robust to different econometric specifications that consider endogeneity problems.

Our research makes several contributions. First, we provide new evidence related to cash policy in family firms (Ozkan and Ozkan 2004; Kuan et al. 2011; Steijvers and Niskanen 2013; Durán et al. 2016; Caprio et al. 2020) by analysing a hitherto unknown board characteristic—gender diversity—thus responding to calls for more research on diversity in family firms (Bannò et al. 2023), since the family nature of the firm may alter the effect of gender diversity on a firm's behaviour (Chadwick and Dawson 2018; Rubino et al. 2017; González et al. 2020; Maseda et al. 2022; Calabró et al. 2023; Gjergji et al. 2023). Consequently, we seek to understand the impact of women's leadership on cash policy in order to further current understanding of women's role in business, beyond what is merely gender diversity (Hoobler et al. 2018). Secondly, we add to the growing literature focusing on female leadership and its influence on corporate decisions (Amore et al. 2014; Sciascia et al. 2014; McGuinness et al. 2017; Chadwick and Dawson 2018; García-Meca et al. 2022). In particular, although family male and female directors share a common history, identity, status and feelings related to the company, our research aligns with studies that point to the existence of differences between male and female family members vis-à-vis their behaviour and goals (Martínez-Jiménez 2009; Fang, et al. 2016;

Campopiano et al. 2017; Gimenez-Jimenez et al. 2021; Akhmedova et al. 2020; Bauweraerts et al. 2022; Calabró et al. 2023). Moreover, we consider differences between family and non-family female directors, given that gender interactions at the top of the corporate hierarchy may influence investment decisions (Amore et al. 2014), since family or non-family female director status will affect their role on the board (Cumming et al. 2015; Hoskisson 2017; Miller and Le Breton-Miller 2014; González et al. 2020; Cruz et al. 2019; Campopiano et al. 2019; Hillebrand et al. 2019; Herdhayinta et al. 2021). This is important because the role played by female directors in family firms has thus far yielded scarce empirical evidence (Kubiček and Machek 2019). Finally, we provide new insights on the tokenism debate and relative power of female directors (Torchia et al. 2011), in accordance with the limited research exploring the presence of a critical mass of female directors in cash policies (Atif et al. 2019). In this regard, we show that the effect of women's relative power on boards is determined by the presence of family ties. In so doing, we provide theoretical arguments and empirical evidence to the effect that examining the critical mass of female directors when determining board power goes beyond merely counting the number of seats held by women on the board but should also extend to include the incentives and capabilities of female directors.

1.1 Institutional context

The first recommendation on gender diversity in Spanish company boards was introduced by the “Corporate Governance Code-2006” (CNMV 2006), although no quota was determined. Companies only needed to appoint a single female board member in order to comply with the code's recommendation. 1 year later, Spain became the first EU country to implement the Equality Law—recommending gender quotas on the boards of listed firms (‘Equality Law’, Organic Law 3/2007). The regulation's aim was to reach a threshold of 40 percent of female directors by 2015 (Reguera-Alvarado et al. 2017). In an effort to encourage companies, the regulation included an incentive to give preference to compliant companies when awarding public administration contracts (De Cabo et al. 2019). However, both the recommendations and the regulation met with limited success, resulting in the coming into force of a new corporate governance code in 2015 (CNMV 2015), which reduced expectations to a 30 percent share of female directors by 2020. Although some companies reported that the low presence of female directors was due to the lack of women willing to sit on boards, and to the effects of the financial crisis (Gabaldon and Giménez 2017), the fact is that by 2020 a large number of Spanish listed companies had managed to reach a quota of around 30 per cent, which encouraged a new recommendation of 40 per cent to be reached in two years (CNMV 2020). Gender diversity regulations in Spain have thus been voluntary or “soft”, since non-compliance does not entail sanctions (Martínez-García et al. 2023). This contrasts with the “hard” regulations adopted in countries such as Norway, France or Belgium. Consequently, achieving social legitimacy or improving corporate reputation are cited as the main reasons why Spanish listed companies appoint female directors (Navarro-García et al. 2022; Peña-Martel et al. 2022).

Moreover, as in most continental European countries, the Spanish institutional environment is characterised by weak investor protection from the legal system, low litigation risk and a high prevalence of ownership concentration (La Porta et al. 1999; Faccio and Lang 2002; Djankov et al. 2008). Such an environment displaces the main agency conflict to the potential expropriation of minority shareholders by controlling owners. In this context, family firms take a prominent position (La Porta et al. 1999; Faccio and Lang 2002, Sacristán-Navarro and Gómez-Anson 2007; Pindado et al. 2012; Bona-Sanchez et al. 2019), with family owners possibly exercising significant control over board appointment policies (Ben-Amar et al. 2013; García-Meca and Santana-Martín, 2023). Moreover, these dominant family owners effectively control the firm and, consequently, the cash holding policy (Ozkan and Ozkan 2004; Kuan et al. 2011; Steijvers and Niskanen 2013; Caprio et al. 2020). Examining what impact female directors have on cash holdings in a country with gender quotas on boards based on soft law, a high presence of family firms, and weak legal protection of external investors thus makes this research both interesting and valuable.

2 Theoretical background

2.1 Family firms and cash holding

Family firms have their own characteristics, as dominant family members may consider non-financial goals more broadly than financial ones and may focus on goals related to their legacy and socioemotional wealth, such as affective family needs, identity, influence, family reputation or the preservation of long-term family control (Gómez-Mejía et al. 2007; Chua et al. 2011; Berrone et al. 2012; Sciascia et al. 2014). Socio-emotional endowment can be defined as the set of affective values a family derives from its dominant position in a firm, including the unrestricted exercise of personal authority vested in family members, enjoying family influence over the decision-making process, and close identification with the firm (Berrone et al. 2012). These family characteristics have triggered increased interest in research into cash holding policies in family firms, since the role of family control in cash policy remains unclear. The level of voting rights in the hands of dominant families gives them the incentives to control the potential risks associated with opportunistic actions by managers that allow for excess cash (Jensen 1986; Bates et al. 2009; Bou-baker et al. 2015). However, Yeh et al. (2001) argue that controlling families have incentives to make corporate decisions that are more in line with their own personal interests than with those of minority shareholders. Ozkan and Ozkan (2004) show that dominant families have incentives to increase cash holdings in order to defend their privileged position. Durán et al. (2016) show that family control incentivises increased cash levels in order to help perpetuate family control over the firm. Kuan et al. (2011) find that family firms with a higher presence of independent directors can increase their cash levels, since their control over the dominant family reduces agency conflicts with minority shareholders. Caprio et al. (2020) report that family

firms have a higher level of cash holding, and that this result is more pronounced when the CEO is a family member and when the firm is less subject to external control. However, examining what influence female directors have on the cash holding policy of family firms remains a relatively unexplored issue.

2.2 Family female directors

Family female directors are no exception to the discrimination and gender stereotypes that affect all women, yet they do face problems specific to their family affiliation as regards their relationships with parents, siblings, conflicts over roles and loyalties, as well as power and authority struggles (Martínez-Jiménez 2009; Akhmedova et al. 2020) that can ultimately complicate their legitimacy as leaders (Martínez-Jiménez 2009; Akhmedova et al. 2020; Calabró et al. 2023).

Although male and female directors share a common history, identity, status and feelings in relation to the firm, gender norms and roles formed from an early age lead to different experiences during their socialisation process (Glover 2014; Hytti et al. 2017), which influences their behaviour and goals (Fang, et al. 2016; Decker et al. 2017; Gimenez-Jimenez et al. 2021). Accordingly, in family firms the leader and successor are often identified with the father and the first-born male, while women are more identified with the care and emotional control of the family, to the detriment of corporate tasks (Ridgeway and Correll 2004; Martínez Jiménez 2009; Chizema et al. 2015). As such, family female directors may have less decision-making power and legitimacy compared to their male relatives, which leads to them being trapped in a ‘golden cage’, i.e. in a protective setting in which they should prioritise their role in the family over their role in the family firm (Martínez-Jiménez 2009; Eddleston and Sabil 2019; Herrera and Agoff 2019; Triklani 2019; Calabró et al. 2023). Consequently, when family female director representation is low, family female directors may play a limited role in favour of male leadership, as family firms tend to promote phenomena such as the ‘old boys’ network or homosociality (Gregory 2009; Holgersson 2013), thereby accentuating the possibilities of family female directors playing an ‘invisible and informal’ role that is more related to the family than to the firm (Martínez-Jiménez 2009; Eddleston and Sabil 2019; González et al. 2020; Bauweraerts et al. 2022). In addition, as gender biases may prevail in family businesses (Dawley et al. 2004; González et al. 2020), the lower presence of family female directors may be a sign of a greater appreciation of family male members. The role of family female directors might thus be overshadowed if they do not reach a critical mass of board seats. In this context, incentives for private family benefits increase (Burkart et al. 2003; Pérez-González 2006)—thereby inducing higher cash levels.

In addition, family female directors may have a greater long-term vision and concern for the family’s reputation, “family pride” and public image with internal and external stakeholders than family male directors (Campopiano et al. 2019; Akhmedova et al. 2020). Moreover, the leadership style of family male and female leaders differs. Danes and Olson (2003) and Amarapurkar and Danes (2005) point out that conflicts and tensions are perceived and experienced differently by family male

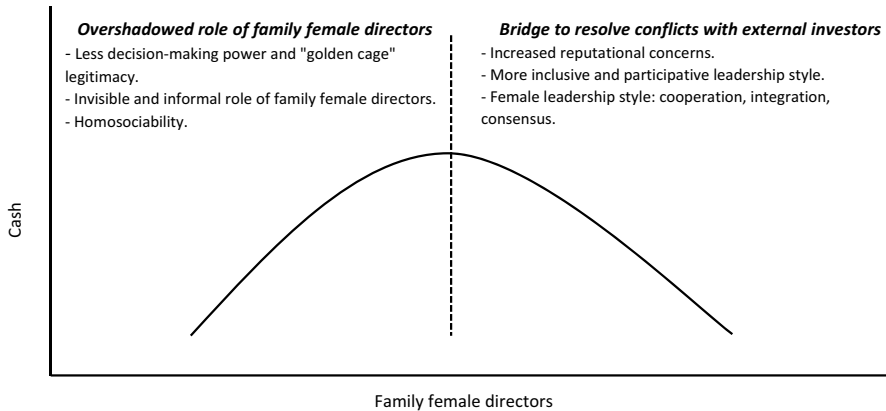


Fig. 1 Family female directors and cash holding

and female members. For example, men are more likely to withdraw from conflict while women are more likely to try to resolve it in a “wife demand-husband withdrawal pattern” (Cupach and Canary 1995). In addition, family men and women members show differences in objective prioritisation, with women attaching greater importance to good family relationships, while men emphasise corporate objectives (Danes et al. 2000; Kubicek and Machek 2019). In this sense, Bauweraerts et al. (2022) note that while male directors tend to emphasise goal-setting, women tend to be characterised by a more inclusive and participative leadership style, keeping communication channels open with more heterogeneous networks of links. In a context where emotion-based relationships, parent–child conflicts or sibling rivalry are relevant, family female directors might therefore play a differentiating role in resolving agency conflicts (Gómez-Mejía et al. 2001). Schwartz (1992) shows that women are better at overcoming different forms of conflict within family firms, including conflict with minority shareholder interests. Studies refer to a ‘feminine’ management style characterised by an orientation towards cooperation, integration, and consensus (Martínez-Jiménez 2009; Campopiano et al. 2017; Kubicek and Machek 2019). However, for female characteristics to manifest themselves, family female directors need power (Bauweraerts et al. 2022). Consequently, if family female directors gain representation on the board, they may have more power to align family interests with those of external investors, i.e. to act as a bridge to resolve conflicts between the dominant family and external investors –thereby reducing cash holdings. The above arguments allow us to state our first hypothesis:

H1 The presence of family female directors has a non-linear inverted U-shaped effect on the level of cash holdings of family firms.

The conceptual model of theoretical arguments is illustrated in Fig. 1.

2.3 Non-family female directors

Part of the research exploring the impact of gender diversity in family firms has focused on analysing the differences between family and non-family female directors, since female directors are not homogenous (Herdhayinta et al. 2021). Family female directors might not be appointed based on their qualifications for monitoring or advisory roles but because of aspects such as nepotism or the inclusion of family quotas (Sliwa and Johansson 2014; Bianco et al. 2015; Holt et al. 2017; González et al. 2020; Herdhayinta et al. 2021). However, non-family female directors are often appointed through a competitive selection process based on their professional experience (Herdhayinta et al. 2021). Accordingly, González et al. (2020) argue that the glass ceiling effect affects non-family female directors more than women with family ties. As such, non-family female directors can be expected to have higher than average personal competence, as they have to go through a much stricter selection process as a result of job discrimination for top management positions and lack of family ties (Adams and Kirchmaier 2015; Schmid and Urban 2017). More often, non-family female directors tend to have greater social capital, as female directors with family ties rely primarily on a personal network, while non-family female directors might benefit from a wider network and from experiences prior to their joining the family firm (Greve and Salaff 2003; Campopiano et al. 2019). On the other hand, family female directors share a culture, values and socioemotional goals that are not shared by non-family female directors (Sharma et al. 2003; Cruz et al. 2010), which results in different incentives and interests between the two (Bammens et al. 2011; Vandebek et al. 2016; Filser et al. 2018; Herdhayinta et al. 2021; García-Meca and Santana-Martín, 2023). Family and non-family female directors thus tend to emphasise different priorities, which may influence their behaviour and decision-making (Chrisman et al. 2012; Cordeiro et al. 2020). The lack of family ties means that non-family female directors are not constrained to achieve family objectives, such that they have less incentive to serve the interests of the owning family than those of the firm (Gimenez-Jimenez et al. 2021; Hillebrand et al. 2020). Non-family female directors may therefore show greater concern for how their decisions affect the firm, thereby increasing the likelihood that they serve the interests of all stakeholders rather than those of the owner family (Cojuharenco et al. 2012; Cruz et al. 2019; Campopiano et al. 2019; Herdhayinta et al. 2021). Consequently, non-family female directors can effectively monitor and promote effective corporate governance practices to a greater extent than family female directors (Adams and Ferreira 2009; Samara et al. 2019; Herdhayinta et al. 2021).

Consequently, we argue that non-family female directors tend to exert greater control and to reduce cash as an instrument to reduce agency conflicts between the dominant family and external investors since they are more active in monitoring, and exhibit greater accountability, thus reducing opportunistic behaviour (Gul et al. 2008; Adams and Ferreira 2009; Ongsakul et al. 2021). This cash-decreasing effect will arise even if the number of non-family female directors is low, as tokenism is less likely to be the reason for having appointed female directors who have no family ties (Gonzalez et al. 2020; Herdhayinta et al. 2021). Moreover, non-family female directors are more concerned about threats to reputational capital than their

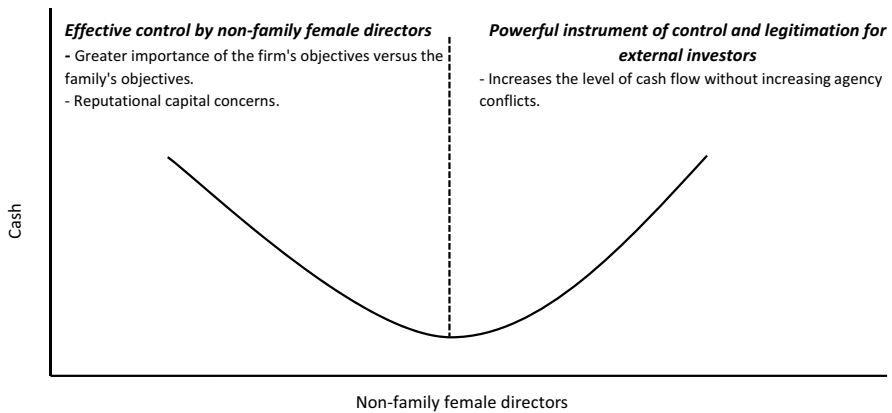


Fig. 2 Non-family female directors and cash holding

male counterparts (Gilson 1990; Godfrey et al. 2020). By reducing cash holdings in order to curb agency conflicts, non-family female directors thus promote their reputation as credible supervisors, which in turn protects the current board appointments of these non-family female directors and increases the likelihood of future appointments.

However, the presence of a critical mass of non-family female directors becomes a sufficiently powerful control and legitimation instrument for external investors (Cruz et al. 2019; Campopiano et al. 2019; Herdhayinta et al. 2021), allowing for increased cash levels without increasing agency conflicts. In other words, the increased control and legitimation associated with the presence of a critical mass of non-family female directors implies that the cash holding preference of family firms (Ozkan and Ozkan 2004; Kuan et al. 2011; Durán et al. 2016; Steijvers and Niskanen 2013; Caprio et al. 2020) does not lead to increased agency conflicts between dominant family and minority shareholders. Considering the above, we state the second hypothesis:

H2 The presence of non-family female directors has a non-linear U-shaped effect on the level of cash holdings of family firms.

The conceptual model of the above arguments is illustrated in Fig. 2.

3 Research design

3.1 Sample and variables

We obtain a sample of 103 non-financial Spanish listed companies from the OSIRIS (Bureau Van Dijk) database for the period 2004–2020, giving an unbalanced

sample of 1232 firm-year observations, with 88.39% of the firms having six or more observations during the period. Choosing 2004 as the starting year for the period analysed is due to the coming into force of Law 26/2003, in which the Spanish government made it compulsory for listed firms to publish an Annual Corporate Governance Report. The Spanish Market Securities Exchange (*Comisión Nacional del Mercado de Valores*, CNMV) established the model for this report in its Act 1/2004. The sample represents 98.25% of Spanish market capitalization in 2020. To define a firm as family-owned, we identify the ultimate owner. We use the chain of control methodology to draw the total control structure through which the dominant family owners control the firms. As a consequence, we obtain a final sample of 72 family firms and 630 firm-year observations.

3.1.1 Cash holding measures

Consistent with previous literature, we use two variables widely employed in the literature to measure cash holding: *CASH*, defined as cash and cash equivalents divided by total assets, and *CASH_ADJUST*, defined as the previous variable adjusted to the industry median (Ozkan and Ozkan 2004; Harford et al. 2008; Bates et al. 2009; Steijvers and Niskanen 2013; Caprio et al 2020).

3.1.2 Family firms and family ties of female directors

To analyse the effect of female director family affiliation on the level of cash holdings, we start from the García-Meca and Santana-Martín (2023) database, which identifies Spanish listed family firms and the family affiliation of female directors in the period 2003–2020. Due to the generalised presence of pyramidal ownership structures among listed companies in Spain (La Porta et al. 1999; Faccio and Lang 2002), we used the chain of control methodology, which identifies a firm's ultimate owner in order to determine company control. For this, previous literature considers two levels of control—10 and 20 percent—with the latter being the minimum level of control considered in our study.¹ A family firm will thus be one in which a family is the ultimate owner of the firm, i.e., a family is the main shareholder, holds at least 20 percent of the voting rights, and is represented on the board. Once companies were identified as family firms, the presence of family ties between the female directors and the controlling family was analysed. To do this, the coincidence of surnames was examined and family-in-law relationships were searched for on the internet. We also asked the company itself. Being a Latin country, Spain has two advantages in this regard that make it easy to identify family relationships. Firstly, married women keep their maiden names. Secondly, there are two surnames, the first being the father's and the second the mother's. We thus define the variables

¹ The study by Caprio et al (2020) –which analyses the level of cash holding in family firms– uses 10 per cent as the level of control. In this study, this level has been considered, and the results do not change from the reported results.

WOMEN_FAMY and *WOMEN_Non-FAMY* as the percentage of family and non-family female directors out of the total number of directors, respectively.

3.1.3 Control variables

The remaining variables include specific characteristics that may be related to the level of cash holding, in line with the study by Opler et al. (1999). We thus include the lagged cash holding variable in order to control for the possible existence of a target level of cash, with the presence of a positive sign in the estimated coefficient signalling a target level of cash flow (Kuan et al. 2011; Durán et al. 2016; Caprio et al. 2020). We therefore include firm size (*SIZE*), defined as the natural logarithm of total assets, a proxy for acquisition deterrence and the presence of economies of scale to cash holdings, and we expect a negative relationship between size and cash holdings. The level of leverage is measured by the variable *DEBT*, defined as the sum of short- and long-term debt divided by total assets. The sign of the impact on cash holding of this variable is unclear, as a negative relationship may indicate that debt is sufficiently constraining, which incentivizes the use of cash holding to reduce financial risk (Bates et al. 2009). However, debt may play a hedging role (Acharya et al. 2007), consistent with a positive relationship between debt and cash holding. The effect of cash flows on the level of cash holdings is considered through the ROA, computed as earnings before interest, taxes, depreciation and amortization divided by total assets, estimating that firms with higher cash flows will accumulate higher levels of cash. Following Harford et al. (2008) and Chen et al. (2020a), we consider *INTANG*, computed as intangible assets divided by total assets as a proxy for financial distress costs. In addition, *VOL.CN* is included as the standard deviation of the last three years of sales. In accordance with the trade-off theory, firms that have more volatile cash flows are more likely to experience cash shortages in the future (Lozano and Durán 2017).

Additionally, corporate governance might be a driver of firms' cash policies (Amess et al. 2015). The board of directors therefore has an impact on agency conflicts. However, the relationship between board size and agency conflicts is not evident, which does not allow us to expect any single sign vis-à-vis the effect of board size on the level of cash (Harford et al. 2008). We include *BOARD* as the natural logarithm of the number of directors. In addition, CEO duality directly affects corporate policies—particularly cash holdings (Krause et al. 2014; Chen et al. 2020b)—although the expected sign is unclear. We thus include *DUALITY* as a dummy variable that equals one if the CEO is the chair of the board, and 0 otherwise. Finally, to consider the role of family directors in determining cash levels in isolation, we include two variables: *VOTING*, measured as the percentage of voting rights held by the controlling family, and *MEN_FAMY*, calculated as the percentage of family male directors divided by the total number of directors. Consistent with previous literature, we expect a positive impact of both variables on the level of cash holding (Ozkan and Ozkan 2004; Kuan et al. 2011; Steijvers and Niskanen, 2012; Caprio et al. 2020). We reduce the impact of outliers on continuous variables by winsorizing at the 1st and 99th percentiles. All variables are defined in the Appendix.

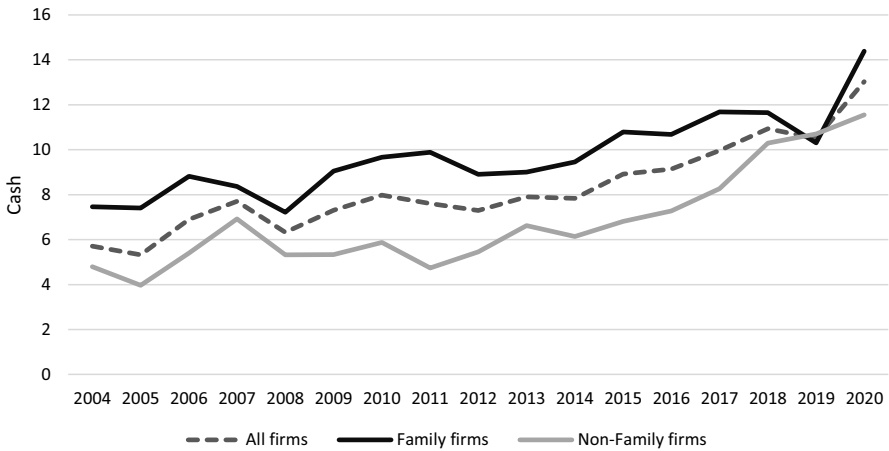


Fig. 3 Cash holding of family vs non-family firms

3.2 Model specification and estimation

After carrying out a prior descriptive analysis, we estimate the main regressions by employing Blundell and Bond's (1998) Generalized Method of Moments (GMM). Using this technique enables us to deal with endogeneity problems, given that the firm endogenously determines both the number of female board directors and cash reserve levels. This leads to certain issues that emerge as a result of omitted unobservable firm characteristics, and which might impact the possible appointment of women directors. For instance, when exploring the impact of board diversity on cash holding, corporate culture (which is not observable) might play a key role in the sense that companies who are more forward-thinking might retain both better cash holding and more women directors. GMM thus enables us to address potential endogeneity problems by using as instruments the variables on the right-hand side of the model lagged one to four times (two to five times for the lag of cash holdings); the only exceptions are the year effects variables, which are considered exogenous. More specifically, we use the two-step system GMM estimation included in the Stata routine set *xtabond2* developed by Roodman (2009). The two-step estimation estimates the regression with heteroscedasticity-robust standard errors. To analyse the effect of board gender diversity on cash holding, we estimate the following empirical model:

$$\begin{aligned}
 CASH_{it} = & \alpha + \beta_1 Gender_{it} + \beta_2 CASH_{it-1} + \beta_3 SIZE_{it} + \beta_4 ROA_{it} \\
 & + \beta_5 DEBT_{it} + \beta_6 BOARD_{it} + \beta_7 VOTING_{it} + \beta_8 INTANG_{it} \\
 & + \beta_9 VOL.CN_{it} + \beta_{10} DUALITY_{it} + \beta_{11} MEN_FAMY_{it} \\
 & + \theta_t + \alpha_j + \varepsilon_{it}
 \end{aligned}$$

where θ_t and α_j are a set of dummy variables representing time and industry, respectively. The error term is represented by ε_{it} .

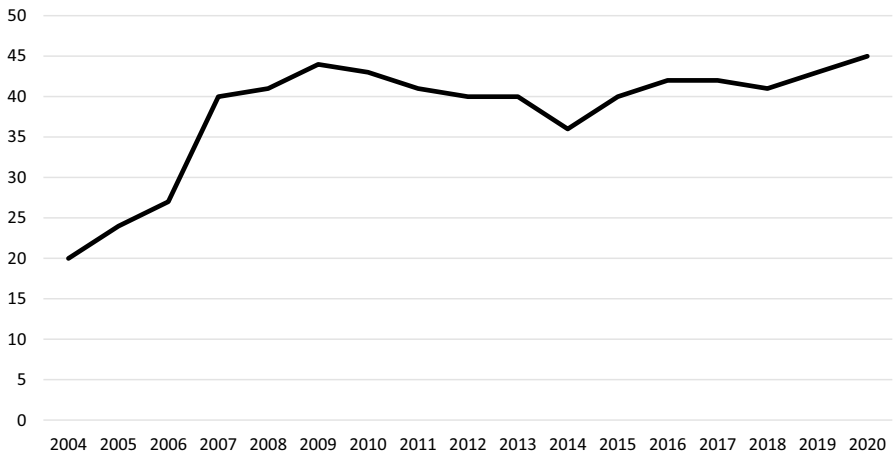


Fig. 4 Family firms (%)

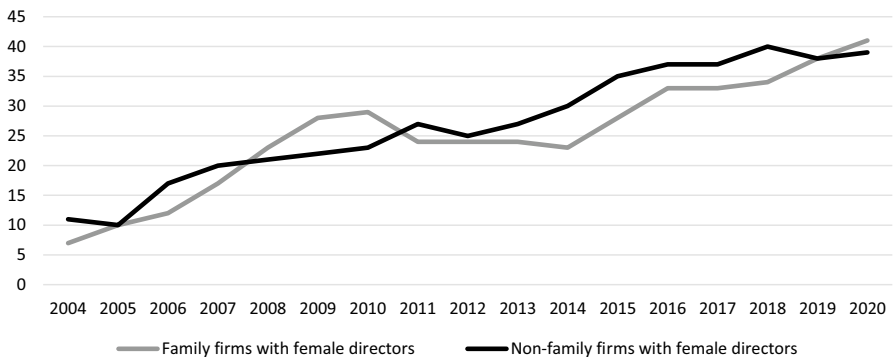


Fig. 5 Family and non-family firms with at least one female director

4 Results

4.1 Sample distribution

Figures 3, 4, 5, and 6 show the sample distribution of the main variables of interest used in the analysis. Initially, we observe the cash accumulated by the companies, the family firms, the presence of at least one woman on the board, and the fraction of female directors on the board. All of this is expressed in percentages. Figure 3 shows that the percentage of cash accumulated by companies more than doubled between 2004 and 2020, thereby reflecting the growing relevance of cash holding in firms' assets. Moreover, in accordance with previous literature, family firms show a greater use of cash than non-family firms (9.70 vs. 6.80, on average). This result is in line with previous studies that relate family control to higher risk aversion, trade-off

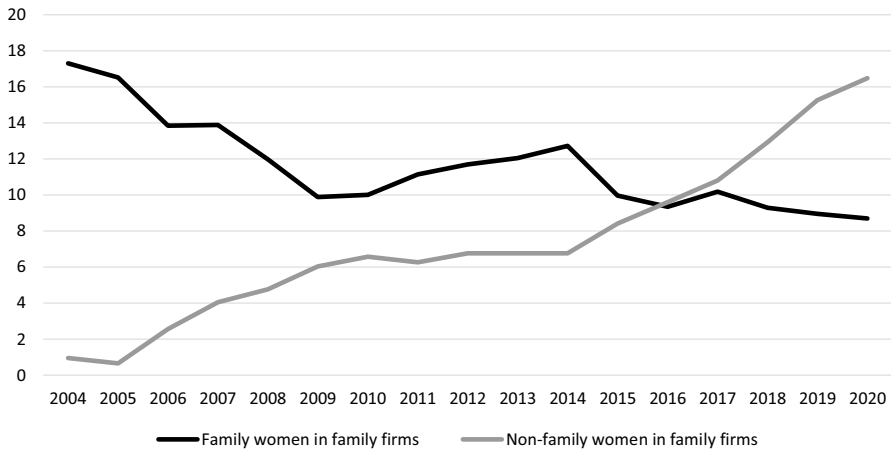


Fig. 6 Women directors and family ties. ^aData are calculated for companies with at least one female director

costs and agency conflicts (Ozkan and Ozkan 2004; Kuan et al. 2011; Durán et al. 2016; Steijvers and Niskanen 2013; Caprio et al 2020).

Figure 4 shows the percentage of family-owned firms among Spanish listed non-financial firms. Results indicate that as of 2007, between 40 and 45 per cent of listed firms in Spain were under family control. These results are in accordance with those obtained in previous research in Spain (Sacristán-Navarro and Gómez-Anson 2007; Pindado et al. 2012; Bona-Sanchez et al., 2019).

Furthermore, in family firms, the number of boards with at least one female member rose from 7% in 2003 to 41% in 2020 (11 to 39 percent in non-family firms) (Fig. 5). This figure shows that, although in 2020 the two types of firms tend to be equal, in most years it is family firms that distinguish themselves by not appointing any women as directors, which may reflect the fact that phenomena such as “old boys” or homosociality are more prevalent in family firms (Gregory 2009; Holgersson 2013; González et al. 2020).

The percentage of female directors in terms of their family affiliation is shown in Fig. 6.² Data indicate that the presence of both types of female directors has evolved in opposite directions; while family female directors are occupying fewer seats on the board of directors, non-family female directors are becoming more prominent. This result seems to indicate that companies seek non-family knowledge, experience and contacts as well as a higher level of independence linked to gender diversity.

4.2 Descriptive statistics

Table 1 shows descriptive statistics for all the variables. In Panel A, data show that at 25% of the sample, cash levels do not reach 3.70% of total assets, with the mean reaching 9.87%, while the median is 7.38%. In addition, the mean percentages of

² Data are calculated for companies with at least one female director.

Table 1 Descriptive statistics

Panel A: Summary statistics										
	Mean	Median	SD	1st Q	3rd Q					
CASH	9.87	7.38	8.65	3.70	13.20					
WOMEN_FAMY ^a	10.74	8.33	10.92	0.00	18.46					
WOMEN_Non-FAMY ^a	8.92	7.69	9.35	0.00	14.28					
SIZE	13.77	13.99	1.92	12.30	15.03					
ROA	5.82	5.77	12.33	2.39	9.75					
DEBT	64.72	65.48	25.00	47.34	79.58					
BOARD	2.28	2.30	0.32	2.07	2.48					
VOTING	46.00	47.00	18.25	29.00	59.46					
INTANG	13.92	6.13	16.12	1.58	23.90					
MEN_FAMY	20.03	16.66	14.81	11.11	26.66					
VOL. CN	0.03	0.03	0.24	0.07	0.12					
DUALITY	0.64	1.00	0.47	0.00	1.00					

Panel B: Correlation matrix											
	CASH	WOMEN_FAMY	WOMEN_Non-FAMY	SIZE	ROA	DEBT	BOARD	VOTING	INTANG	MEN_FAMY	VOL. CN
WOMEN_FAMY	-0.045										
WOMEN_Non-FAMY	0.095**	-0.099**									
SIZE	0.020	0.042	0.195***								
ROA	0.236***	0.039	0.007	0.071*							
DEBT	0.072*	-0.122***	0.065*	0.177***	-0.395***						
BOARD	-0.034	-0.042	0.114***	0.623***	0.085**	0.089**					
VOTING	0.070*	0.073*	0.053	0.111***	0.085**	0.148***	-0.222***				

Table 1 (continued)

Panel B: Correlation matrix											
CASH	WOMEN_FAM	WOMEN_Non-FAM	SIZE	ROA	DEBT	BOARD	VOTING	INTANG	MEN_FAM	MEN_FAM VOL_CN	VOL_CN
INTANG	-0.119***	0.144***	0.126**	0.005	-0.009	0.177***	0.031				
MEN_FAM	-0.003	-0.228***	-0.190***	-0.063	0.021	-0.309***	0.205***	-0.276***			
VOL_CN	0.005	-0.020	0.069*	0.247***	-0.106***	0.052	-0.036	0.066	-0.014		
DUALITY	0.132***	-0.019	0.146***	0.085**	0.064*	0.130***	-0.044	-0.170***	-0.090**	0.024	
WOMEN_FAM	WOMEN_Non-FAM	SIZE	ROA	DEBT	BOARD	INTANG	VOTING	MEN_FAM	MEN_FAM VOL_CN	CEO_DUALITY	VOL_CN
VIF	1.16	1.96	1.36	1.34	2.06	1.20	1.33	1.36	1.08	1.11	1.11

Panel C: Firm-year observations with and without women directors											
Family firm-year observations with women directors N = 416						Family firm-year observations without women directors N = 214					
	Mean	Median	SD	Mean	SD	Mean	Median	SD	Mean	SD	t-student
CASH	10.03	8.09	7.92	9.55	5.91	9.55	5.91	9.92	9.55	5.91	-0.674
SIZE	14.13	14.41	2.00	13.08	13.21	13.08	13.21	1.54	13.08	13.21	6.798***
ROA	6.49	5.38	10.75	4.53	6.11	4.53	6.11	14.87	4.53	6.11	1.920*
DEBT	64.22	65.84	24.88	65.69	63.75	65.69	63.75	25.26	65.69	63.75	0.710
BOARD	2.34	2.39	0.29	2.16	2.19	2.16	2.19	0.34	2.16	2.19	7.082***
VOTING	46.58	57.92	17.91	44.88	44.00	44.88	44.00	18.88	44.88	44.00	1.125
INTANG	15.65	7.51	16.64	10.56	3.45	10.56	3.45	14.52	10.56	3.45	3.849***
MEN_FAM	17.74	14.28	12.77	24.48	18.18	24.48	18.18	17.30	24.48	18.18	-5.623***
VOL_CN	0.038	0.029	0.23	0.037	0.037	0.037	0.037	0.268	0.037	0.037	0.075
DUALITY	0.65	1	0.47	0.61	1	0.61	1	0.48	0.61	1	0.922

*, **, *** indicate significant at 10, 5, 1%, respectively

*Data are calculated for companies with at least one female director

Table 2 Board gender diversity and cash holding in family firms

Dependent variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
	CASH	CASH_ADJUST	CASH	CASH_ADJUST	CASH	CASH
WOMEN_FAM _{<i>t</i>}	0.114 ^{***} (2.56)	0.111 ^{***} (2.92)			0.495 ^{***} (3.11)	
WOMEN_FAM _{<i>t</i>} ²	-0.005 ^{***} (-6.47)	-0.005 ^{***} (-3.44)	-0.193 ^{***} (-3.34)	-0.161 ^{**} (-2.15)	-0.023 ^{***} (-2.85)	-1.757 [*] (-1.82)
WOMEN_Non-FAM _{<i>t</i>}			0.006 ^{***} (4.93)	0.005 ^{***} (3.47)		0.055 [*] (2.01)
WOMEN_Non-FAM _{<i>t</i>} ²			0.679 ^{***} (29.65)		0.146 ^{**} (2.53)	0.186 [*] (1.95)
CASH _{<i>t-1</i>}	0.742 ^{***} (30.64)	0.765 ^{***} (30.02)		0.754 ^{***} (31.50)		
CASH_ADJUST _{<i>t-1</i>}						
SIZE _{<i>t</i>}	-0.526 ^{***} (-3.51)	-0.059 (0.46)	-0.250 [*] (1.71)	-0.055 (-0.47)	-0.365 (-0.88)	4.743 (0.81)
ROA _{<i>t</i>}	0.048 ^{***} (3.29)	0.031 ^{**} (2.09)	0.033 ^{**} (2.31)	0.017 (1.30)	0.025 (0.88)	0.390 ^{**} (2.09)
DEBT _{<i>t</i>}	0.025 ^{***} (3.66)	0.002 (0.40)	0.026 ^{***} (3.76)	0.002 (0.39)	0.010 ^{**} (2.03)	0.041 (1.48)
BOARD _{<i>t</i>}	2.340 ^{***} (2.70)	0.427 (0.52)	0.700 (0.90)	0.529 (0.74)	2.635 (1.10)	1.716 (1.15)
VOTING _{<i>t</i>}	0.001 (0.19)	0.021 ^{**} (2.12)	0.005 (0.48)	-0.002 (0.24)	0.012 (0.35)	0.078 (0.47)
INTANG _{<i>t</i>}	-0.038 ^{***} (-2.74)	-0.025 ^{**} (-1.99)	-0.040 ^{***} (-3.00)	-0.020 [*] (-1.69)	-0.062 [*] (-1.87)	-0.262 [*] (-1.99)
VOL_CN _{<i>t</i>}	0.448 ^{**} (2.33)	0.149 (0.78)	0.034 [*] (1.87)	0.121 (0.68)	0.158 (0.90)	0.096 (0.12)
DUALITY _{<i>t</i>}	1.612 ^{***} (3.75)	0.744 [*] (1.75)	2.358 ^{***} (5.77)	1.090 ^{***} (2.82)	5.409 ^{***} (4.88)	8.472 (1.42)
MEN_FAM _{<i>t</i>}	0.013 (0.89)	0.003 (0.20)	0.004 (0.33)	0.010 (0.78)	0.009 (0.22)	2.108 ^{**} (2.03)
CONSTANT	2.137 (1.10)	-4.386 ^{**} (-2.26)	1.257 (0.62)	1.293 (0.76)	3.901 (0.65)	-1.411 (-1.17)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
F test	1257.36 ^{***}	2797.26 ^{***}	4425.59 ^{***}	2770.65 ^{***}	997.65 ^{***}	771.47 ^{***}
Hansen test	40.29	45.90	27.79	45.01	48.43	9.89
M2	-0.48	-1.18	-1.19	-1.21	-0.18	-1.15

Table 2 (continued)

Dependent variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
CASH	1240.77 ^{***}	1111.99 ^{***}	1184.91 ^{***}	1211.89 ^{***}	74.53 ^{***}	15.80 ^{***}
Z1	27.90 ^{**}	35.57 ^{***}	42.24 ^{***}	35.90 ^{***}	42.24 ^{***}	21.80 ^{***}
Z2	45.71 ^{***}	692.23 ^{***}	58.01 ^{***}	35.90 ^{***}	34.37 ^{***}	10.32 ^{***}
Z3	630	630	630	630	274	274
No. of observations	630	630	630	630	274	274

^{*}, ^{**}, ^{***} indicate significant at 10, 5, 1%, respectively

family and non-family female directors are 10.74 and 8.92 percent, respectively. In Panel B, we report the correlation matrix for all the variables. Given that the correlation between the main variables of interest is low, multicollinearity is unlikely to be the driver behind our regression results, and the low values of the VIF would seem to confirm this (Studenmund 1997).

In addition, a mean difference analysis was conducted to initially study the relationship between board gender diversity and the company's cash holdings. Firm-year observations were divided into two subsamples according to whether or not they appointed women to their board of directors (Panel C). Results indicate no statistically significant differences—in terms of cash holdings—between family firms with and without female directors. Furthermore, data suggest that family firms with female directors are larger (*SIZE*), enjoy greater profitability (*ROA*), have more board members (*BOARD*), and have more intangible resources (*INTANG*). Additionally, family firms with female directors have fewer family male directors. However, there are no statistically significant differences between family firms with and without female directors in the percentage of voting rights of the dominant family (*VOTING*), debt level (*DEBT*), board duality (*DUALITY*), and sales volatility (*VOL.CN*).

4.3 Multivariate analysis

Table 2 presents the estimates to analyse the relationship between board gender diversity and the level of cash holding in family firms. Model 1 shows an inverted U-shaped relationship between the presence of family female directors and the level of cash. This result supports our hypothesis H1. Model 2 reports the results when we measure cash holding by adjusting for the annual industry median, while Model 5 shows the estimates when we use a more restrictive definition of a family firm, i.e., defining a business as a family firm when it has at least a 50 percent level of voting rights in the hands of the dominant family. In contrast, Models 3, 4 and 6 (Table 2) indicate that the effect on the level of cash holding of non-family female directors has a U-shaped relationship—thereby supporting our hypothesis H2. Consequently, estimates show a turning point for family female directors at around 11% of the board and for non-family female directors at around 16%.

As regards the control variables, lagged cash holding (*CASH*), profitability (*ROA*), debt (*DEBT*), and CEO duality (*DUALITY*) present a positive and significant correlation with cash holding. However, firm size (*SIZE*) and intangible assets (*INTANG*) show a negative and statistically significant effect on cash level. Finally, board of director seats (*BOARD*), dominant family's voting rights (*VOTING*), family male directors (*MEN_FAMY*), and sales volatility (*VOL.CN*) show no significant impact on cash holding.

In order to check the consistency of the GMM estimates for all the models, we performed two tests. First, the Hansen test indicates that the instruments used by the GMM regressions are valid. Second, the M2 test shows that second-order autocorrelation is not present in the GMM regressions. Finally, we performed Wald tests for the joint significance of the indicated coefficients (*Z1*), the joint significance of the time dummy variables (*Z2*), and the joint significance of the industry dummy variables (*Z3*).

Table 3 Board gender diversity and cash holding in family firms

Dependent variable	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
	CASH ^a (OLS)	CASH ^a (OLS)	CASH (2SLS)	CASH (2SLS)	CASH (Heckman)	CASH (Heckman)
WOMEN_FAMY _t	0.081* (1.71)		1.391** (1.91)		0.117* (1.88)	
WOMEN_FAMY _t ²	-0.004* (-1.82)		-0.063** (-1.92)		-0.005*** (-2.60)	
WOMEN_Non-FAMY _t		-0.096** (-2.20)				-0.188* (-1.89)
WOMEN_Non-FAMY _t ²		0.003* (1.74)				0.006* (1.68)
CASH _{t-1}	0.719*** (24.31)	0.871*** (25.10)	0.695*** (13.27)	0.712*** (14.58)	0.604*** (12.11)	0.600*** (11.59)
SIZE _t	-0.257 (1.45)	-0.102*** (-2.90)	-0.122 (-0.43)	-0.192 (-0.69)	-0.570** (-2.08)	-1.136*** (-3.22)
ROA _t	0.017 (0.77)	0.008* (1.97)	0.015 (0.44)	0.025 (0.67)	0.029 (0.76)	0.011 (0.29)
DEBT _t	0.012 (1.12)	0.006** (2.46)	0.018 (1.04)	0.009 (0.59)	0.014 (0.86)	0.020 (1.10)
BOARD _t	2.143** (2.01)	0.044 (0.28)	3.955* (1.90)	1.770 (0.90)	3.536** (2.33)	3.745 (1.32)
VOTING _t	0.001 (0.90)	0.001 (0.45)	0.030 (1.28)	0.004 (0.20)	0.023 (1.19)	0.026 (1.13)
INTANG _t	-0.022* (-1.83)	-0.008*** (-3.62)	-0.016 (-0.49)	-0.044** (-2.43)	-0.042* (-1.76)	-0.016 (-0.64)
VOL.CN _t	0.176 (0.92)	0.414 (1.80)	0.206 (1.33)	0.124 (0.82)	1.315 (1.50)	-1.286 (0.76)
DUALITY _t	0.776* (1.85)	0.168** (2.30)	0.727 (1.04)	1.807** (2.19)	1.528** (2.24)	0.855 (0.96)
MEN_FAMY _t	0.007 (0.45)	0.003* (1.73)	0.008 (0.39)	0.008 (0.89)	0.039 (1.32)	0.078*** (2.22)
CONSTANT	2.663 (1.15)	3.332 (0.98)	0.354 (0.50)	0.852 (1.63)	7.884* (2.09)	3.777*** (3.61)
Year effect	Yes	Yes	Yes	Yes	Yes	Yes
Industry effect	Yes	Yes	Yes	Yes	Yes	Yes
F test	43.97***	13.08***	12.57***	15.77***		
Wald Chi2					284.62***	216.90***
Dependent variable			<i>First-stage regression</i>			
Instrument: MEN_LINKED_WOMEN			WOMEN_FAMY	WOMEN_Non-FAMY	D_WOMEN_FAMY	D_WOMEN_Non-FAMY
			0.046*** (2.78)	0.035*** (2.52)	0.042*** (7.26)	0.042*** (7.26)
F test			82.20***	65.60***		

Table 3 (continued)

Dependent variable	Model 7 CASH ^a (OLS)	Model 8 CASH ^a (OLS)	Model 9 CASH (2SLS)	Model 10 CASH (2SLS)	Model 11 CASH (Heckman)	Model 12 CASH (Heckman)
Sargan test			1.07	0.05		
Mills ratio λ					-1.643 (-1.36)	3.649 (-1.14)
No. of observations	630	630	630	630	630	630

Robustness

***, **, * Statistically significant at p.01, p.05 and p.10, respectively

^aIn models 7 and 8, all the independent variables have been lagged to consider endogeneity

4.4 Robustness

In order to analyse whether the results obtained above are determined by the regression method, we use different estimation methods in Table 3. Models 7 and 8 report estimates of OLS regressions, including year and industry fixed effects. Moreover, standard errors are clustered by firm in both models. The results obtained in the two models do not differ from those obtained previously.

Furthermore, analysing the relationship between board composition and cash level may prove problematic, as cash holdings and governance system are determined jointly (Harford et al. 2008). Accordingly, in order to reinforce the integrity of the analysis, we conduct two alternative estimation methods that consider the problem of endogeneity. We use an instrumental variables approach—specifically two-stage least squares (2SLS)—since this may prove useful vis-à-vis removing coefficients of endogeneity bias (Chen et al. 2017). As an instrumental variable, we use the variable *MEN_LINKED_WOMEN*, measured as the fraction of board members who form part of other boards on which there is at least one female director (Adams and Ferreira 2009; Levi et al. 2014; Chen et al. 2017). The more connected a firm's directors are to female members of other boards, the more female directors should be on the firm's board—thereby suggesting a positive relationship between *MEN_LINKED_WOMEN* and the proportion of female directors. The system of simultaneous equations is as follows:

$$\begin{aligned} \text{Gender_Estimated}_{it} = & \alpha + \beta \text{MEN_LINKED_WOMEN}_{it} \\ & + \gamma Z_{it} + \text{Industry}_i + \text{Year}_t + \varepsilon_{it} \end{aligned} \quad (1)$$

$$\text{Cash Holding}_{it} = \alpha + \beta \text{Gender_Estimated}_{it} + \gamma Z_{it} + \text{Industry}_i + \text{Year}_t + \varepsilon_{it} \quad (2)$$

The results obtained through the 2SLS estimation shown in Models 9 and 10 of Table 3 are consistent with those obtained previously. Finally, as a further robustness test, we use Heckman's two-stage correction model in order to mitigate sample selection bias. In the first stage, we estimate the determinants of gender diversity using a probit model, i.e. we model the probability that a firm has a female director as a function of the instrumental variable defined above, estimating the lambda coefficient or non-selection risk. In the second stage, we use our main regression model and include the lambda coefficient. The lambda coefficient describes the covariance between the unobserved factors in the selection equation and the outcome equation. As can be seen, the results found in Models 11 and 12 (Table 3) are consistent with those presented in Table 2. Moreover, in both models, the Mills ratio is not significant, which indicates there is no issue of sample-selection bias. Consequently, although it is not possible to completely rule out all endogeneity problems, the results of the different methods used do confirm the main findings and indicate that the findings are not determined by the application of a different estimation method.

5 Discussion

Despite the key role played by family firms in the business arena and the fact that the number of female director appointments has increased significantly (Family Business Index, Ernst and Young 2023), current knowledge of what impact gender diversity has on family businesses remains very scarce (Kubiček and Machek 2019). Previous literature has shown a tendency of dominant owner families to increase cash levels, with the primary objective of maintaining their privileged position in controlling the firm, and thereby exacerbating conflicts with external investors (Ozkan and Ozkan 2004; Kuan et al. 2011; Durán et al. 2016; Caprio et al. 2020). In this context, we find that family female directors possess distinctive features that distinguish them from their male relatives and, in turn, display interests and incentives that differ from their non-family counterparts. We show that the presence of family and non-family female directors has a different effect on cash holding policies and that their impact depends on the relative power of the two types of female directors on the board of directors.

Results indicate that when the presence of family female directors has not reached a critical mass on the board, their low representation is more likely to accentuate their invisible and informal role, which is more related to family welfare and well-being than to corporate policies (Martínez-Jiménez 2009; Eddleston and Sabil 2019; Herrera and Agoff 2019; Triklani 2019; Bauweraerts et al. 2022; Calabró et al. 2023). This means that family female members may be overshadowed by their male relatives by incentivising higher cash levels—the slope of no-lineal relationship is upwards—in order to favour dominant family control and reduce external financial market discipline (Burkart et al. 2003; Pérez-González 2006). However, when family female members reach a critical mass on the board, cash levels are reduced—the slope of no-lineal relationship is downwards. This result supports arguments that family female members have a different way of understanding and resolving conflicts compared to their male counterparts, since they place greater emphasis on cooperation, integration, and consensus (Martínez-Jiménez 2009; Campopiano et al. 2017; Kubicek and Machek 2019), thereby showing their ability to reduce agency conflicts (Schwartz 1992; Gómez-Mejía et al. 2001). Consequently, findings show that the presence of a critical mass of family female directors serves as a cohesive instrument to reconcile the interests of the dominant family and external investors, encouraging the reduction of cash and thereby reducing conflicts between the family and other investors.

However, the relationship between the presence of non-family female directors and the level of cash is the opposite of what we show in the case of family female directors. Non-family female directors reduce the level of cash, even though the number of board seats does not reach a critical mass—the slope of no-lineal relationship is downwards. This result supports arguments pointing to their greater concern for control and the reduction of agency conflicts vis-à-vis family objectives (Cojuharenco et al. 2012; Cruz et al. 2019; Campopiano

et al. 2019; Gimenez-Jimenez et al. 2021; Hillebrand et al. 2020; Herdhayinta et al. 2021). Moreover, their effect is shown despite low board presence. This is because the appointment of female directors without family ties is less likely to be for symbolic reasons (González et al. 2020; Herdhayinta et al. 2021) or because of their greater concern for reputational capital (Gilson 1990; Godfrey et al. 2020). Consequently, by reducing cash holdings in order to reduce agency conflicts, non-family female directors promote their reputation as supervisors, which in turn protects their current board appointments and increases the likelihood of future appointments. However, the presence of a critical mass of non-family female directors allows cash levels to be increased—the slope of non-linear relationship is upwards—since the appointment of a significant number of non-family female directors becomes a sufficiently powerful control and legitimisation instrument for external investors (Cruz et al. 2019; Campopiano et al. 2019; Herdhayinta et al. 2021).

6 Conclusions

6.1 Theoretical contribution

Our study offers important contributions to the literature that addresses the effect of gender diversity on cash holdings. First, we provide new empirical evidence regarding the impact of female director presence on cash holdings in family firms. Second, we explore a new and in-demand approach (Hoobler et al. 2018; Kubiček and Machek 2019), separating female board members based on their family affiliation with the dominant family, identifying them as two separate and distinct groups with different interests and incentives. In doing so, we distinguish family female directors from their male counterparts—who have the greatest weight in the ‘family effect’—and we show that when family female directors reach a critical mass they might play a more conciliatory role that ensures the common goals of all stakeholders. Furthermore, we add new arguments to the scarce literature that does not consider female directors in family firms to be a homogeneous group. In this way, we show that aspects such as legitimacy, tokenism, capacity or reputational concerns do not act in the same way in family and non-family female directors, which affects their role in terms of determining cash policy. Third, we add evidence to the limited existing literature exploring the effect on cash policy of the presence of a critical mass of female directors (Atif et al. 2019). We bring to light the presence of non-linear relationships between gender diversity and cash level—in line with Kanter’s (1977) arguments. In this sense, we add our arguments to the tokenism debate (Torchia et al. 2011), and posit that the symbolic use of female directors is heterogeneous and may be affected by the presence of family ties.

6.2 Practical implications

The findings have practical implications, especially in environments where weak institutions allow family owners to exercise greater dominance over corporate decisions in favour of their own interests (González et al. 2020; Herdhayinta et al. 2021). In this sense, media, politicians, and regulators should encourage greater transparency about the links between female directors and dominant owners so that external investors can better understand their incentives and interests. In this regard, the results indicate that the effects of gender diversity on boards go beyond merely considering the number of female directors.

6.3 Limitations and future research

The study is not without limitations, especially with regard to the difficulty involved in measuring family ties when they are not formalised. However, the results obtained do pave the way for further research to explore what effect gender diversity has on firms' cash holdings. It could be interesting to examine the role of women by considering what position they hold on the board, e.g. chair or vice-chair, their role in the different board committees, or by looking at other factors such as education, since—as shown herein—women should be considered as a non-homogeneous group. Furthermore, exploring the role of female directors by considering aspects such as their seniority in the company, ownership stake, or educational background and qualifications might also prove enlightening.

Appendix

See Table 4.

Table 4 Definitions of variables and data source

Definitions of variables		Data source
<i>Measure of cash holding</i>		
CASH	Cash and cash equivalents divided by total assets	OSIRIS database
CASH_ADJUST	Cash and cash equivalents divided by total assets adjusted to the industry median	OSIRIS database
<i>Measures of board gender diversity</i>		
WOMEN_FAMY	The percentage of family female directors out of the total number of directors	García-Meca and Santana-Martín (2023) database
WOMEN_Non-FAMY	The percentage of non-family female directors out of the total number of directors	García-Meca and Santana-Martín (2023) database
D_WOMEN_FAMY	Dummy variable that equals one if there is at least one family female director on the board of directors, and 0 otherwise	García-Meca and Santana-Martín (2023) database
D_WOMEN_Non-FAMY	Dummy variable that equals one if there is at least one non-family female director on the board of directors, and 0 otherwise	García-Meca and Santana-Martín (2023) database
<i>Control variables</i>		
SIZE	Natural logarithm of assets	OSIRIS database
DEBT	The sum of short- and long-term debt divided by total assets	OSIRIS database
ROA	Return on assets, computed as earnings before interest, taxes, depreciation, and amortization divided by total assets	OSIRIS database
INTANG	The percentage of intangible assets divided by total assets	OSIRIS database
VOL.CN	The standard deviation of the last three years of sales	OSIRIS database
BOARD	Natural logarithm of the number of directors	Annual corporate governance report
DUALITY	Dummy variable that equals one if the CEO is the chair of the board, and 0 otherwise	Annual corporate governance report

Table 4 (continued)

Definitions of variables	Data source
VOTING	Annual corporate governance report
MEN_FAMY	Annual corporate governance report
<i>Instrumental variable</i>	
MEN_LINKED_WOMEN	Own elaboration from information in the OSIRIS database

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Availability of data and materials The data that support the findings of this study are available from the authors upon reasonable request. However, restrictions do apply to the availability of these data, which were used under licence for the current study, and so are not publicly available.

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