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Family Control and Investment Efficiency: Does Financial Analyst Coverage Matter?
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Control familiar y eficiencia de la inversión: ¿Importa el siguiente analista financiero?

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Résumé de l'article

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ABSTRACT

The purpose of this paper is to investigate the effect of family control on investment efficiency and to highlight the moderating effect of analyst coverage. Based on a sample of French-listed companies, the results show a negative effect of family excess control and successive generational stage on investment efficiency. This negative effect is mainly driven by the underinvestment problem. These findings suggest that family firms are associated with exacerbated information asymmetry issues leading them to miss investment opportunities. However, analyst coverage, as an external corporate governance device, helps mitigating information asymmetry and the problem of inefficient investments in family firms.

Keywords: Investment efficiency, family firms, information asymmetry, excess control, family generational stage, analyst coverage

Résumé

Ce papier a pour objet d'examiner l'effet du contrôle familial sur l'efficacité des investissements. Sur la base d'un échantillon de sociétés cotées en France, les résultats montrent l'existence d'un effet négatif de l'excès de contrôle familial et du stade générationnel sur l'efficacité des investissements. Cet effet négatif est principalement dû au problème du sous-investissement. Ces résultats suggèrent que les entreprises familiales sont associées à des problèmes d'asymétrie de l'information. Cependant, le suivi par les analystes, en tant que mécanisme externe de gouvernance d'entreprise, aide à atténuer l'asymétrie de l'information, et le problème des investissements inefficaces dans les entreprises familiales.

Mots-Clés : Efficacité des investissements, entreprises familiales, asymétrie de l'information, contrôle excessif, stade générationnel, couverture des analystes

Resumen

Este documento tiene como objetivo examinar el efecto del control familiar en la eficiencia de la inversión. Utilizando una muestra de empresas que cotizan en la bolsa francesa, los resultados obtenidos muestran un fuerte efecto negativo del exceso de control familiar y la etapa generacional sobre la eficiencia de la inversión. Estos hallazgos sugieren que en las empresas familiares existen problemas de asimetría de información exacerbada que las conducen a perder oportunidades de inversión. Sin embargo, la cobertura de los analistas, como un dispositivo externo de gobierno corporativo, ayuda a mitigar el problema de las inversiones ineficientes en las empresas familiares.

Palabras Clave: Eficiencia de inversión, empresas familiares, asimetría de información, control excesivo, etapa generacional familiar, cobertura de analistas

Several studies have focused on the optimal allocation of capital through investment decisions (Richardson, 2006; Biddle *et al.* 2009 and Goodman *et al.* 2014). In a perfect market, Modigliani and Miller (1969) argue that firms will have resources for all investments with positive NPV at the cost of capital. Accordingly, companies engage in investments if the market evaluates their investments at a value higher than their cost. However, market imperfections constrain companies to respond to investment opportunities, and this may lead to sub-optimal investments (Chen *et al.*, 2017a). Indeed, financial markets are far from being perfect and that financial constraints prevent them to invest efficiently (Campello *et al.* 2010 and Chen *et al.* 2011). Previous Literature focuses on two main frictions: information asymmetry and agency problems (Stein, 2003). While information asymmetry models, related to the higher costs of external funds, predict the presence of the underinvestment problem due to the adverse selection problem, moral hazard models put forward the overinvestment problem for "empire building" purposes (Jensen, 1986).

Investment decision-making is associated with ownership structure. Several recent studies investigate whether ownership structure is a determinant of investment (Chen *et al.* 2017a; Fahlenbrach, 2009). Our research focuses more specifically on the relationship between family ownership and investment efficiency in the French context. In many countries, family ownership is the predominant type of ownership structure (Anderson and Reeb, 2003 and Dahya *et al.* 2008). Moreover, family behavior is specific as families are more risk averse than their non-family counterparts (Anderson *et al.*, 2012). This may affect the investment decision as the risk aversion behavior is sub-optimal in the investment decision process (Gao and Yu, 2018). In addition, family ownership is often associated with agency problems between family owners and minority shareholders (Villalonga and Amit, 2008). Family firms have also exacerbated information asymmetries as families often retain information for private purposes (Patelli and Prencipe, 2007).

Previous research focus on the effects of other types of ownership structure i.e. state and foreign ownership on investment efficiency (Chen *et al.* 2017a and Chen *et al.* 2011). The effect of family firms in the investment process is rarely explored in the literature (Pindado *et al.* 2011; Kuo *et al.* 2012). We extend existing literature by investigating many facets of family firms i.e. ownership, control, management, and the generational stage effect. We also differ from previous studies that only focus on the behavior of family firms relative to the cash flow sensitivity of investment. We consider France as the appropriate institutional context to study this relationship since there is a dominance of family firms in the French market (Bouzgarrou and Navatte, 2014). French firms are mostly controlled by families through pyramiding, cross-holding, non-voting shares and double voting rights (Boubaker and Labegorre, 2008). Moreover, France, is a civil law country (La Porta *et al.* 1998) where investors' interests are weakly protected. This would exacerbate the expropriation risk of minority shareholders by French-controlled firms.

The purpose of this study is not limited to the relationship between family control and investment efficiency. It focuses also on external governance devices able to affect this relationship and ensure optimal allocation of resources in family firms. Among these devices, financial analysts, as information intermediaries are likely to mitigate information asymmetry issues in family firms (Chen *et al.* 2010). Second, financial analysts are able to reduce agency conflicts as a monitoring device (Miller, 2006). They are likely to be more effective in their monitoring role in a weak legal environment such as the case in France. To the best of our knowledge, this is the first study that examines the moderating effect of financial analysts' coverage, as an external monitoring device, on investment efficiency in family firms.

More broadly, we first empirically investigate whether the presence of a controlling family exacerbates the problem of capital allocation by considering the effect of the separation between cash flow rights and voting rights in family-controlled firms. Second, we control for the effect of family involvement in management. Third, we explore the effect of the generational stage on investment efficiency as the behavior of the founder regarding investment may be different from its successors. Our study contributes to the investment literature by providing new evidence on how family control harms investment efficiency in the French context. We show that excess control and the generational stage are important drivers of the investment efficiency in family firms. Furthermore, our study sheds light on the behavior of family firms in France and provides market participants with a better understanding of the importance of analysts in enhancing the firm informational environment and then the investment process, particularly in a country where investors' rights are poorly protected.

The remaining of the paper is organized as follows. In section 2, we review the literature and develop our hypotheses. Section 3 describes our sample and the variables used in the study followed by results and discussion in section 4. The last section concludes the paper.

Literature Review and Hypotheses

The Investment Efficiency Concept

According to previous literature, investment efficiency refers to the allocation of firm's financial resources to the most profitable projects (X^e, 2015). According to Kothari et al. (2010), investment efficiency means that capital flows are used optimally to maximize firm value. The traditional neoclassical theory stipulates that the net present value (NPV) criteria is a measure of the firm's additional value creation (Charreaux, 2000). A firm is considered as investing efficiently if it undertakes projects with positive NPV. Miller and Modigliani (1961) suggest that in a perfect market, managers are able to maximize the market value of the firm by investing in projects with positive NPV and rejecting those with negative NPV. Consequently, companies invest efficiently by selecting investment opportunities when the marginal q (the ratio of the marginal return on capital and its marginal cost) is greater than one (Hayashi, 1982). However, this hypothesis was challenged due to various frictions likely to guide companies' investment choices (Bertrand and Mullainathan, 2003). Actually, firms are likely to make inefficient investment decisions and over or under-invest when managerial interests diverge from shareholders' ones (Jensen and Meckling, 1976). This is also the case in presence of financial constraints and information asymmetry issues between the firm and external investors (Myers and Majluf, 1984).

Information asymmetry models, linked to the high costs of external funds, suggest that managers act for the interests of current shareholders at the expense of potential investors (Myers and Majluf, 1984; Greenwald et al. 1984). They are then likely to issue new shares when they hold private information leading to an overvaluation problem (Chen et al. 2017a). The market rationally perceives this news as a bad signal and discounts new share issuance. Consequently, managers of companies with good investment opportunities are reluctant to issue shares at a reduced price even if they will miss the opportunity of valuable projects (Stein, 2003). This means that companies can reject opportunities to raise funds for investment giving rise to an underinvestment problem.

In contrast to information asymmetry models that assume that managers act in the interests of shareholders, agency models (Jensen and Meckling, 1976) suggest that managers seek to privilege their personal well-being at the expense of shareholders' interests. This leads to agency conflicts of interests between managers and shareholders due to managerial preferences toward running large companies rather than profitable ones (Stulz, 1990). Moreover, the free cash flow theory of Jensen (1986) assumes that the motives of "Empire Building" within the company, lead managers with excess cash flow, to over-invest. Hence, managers will prefer to engage in negative NPV projects rather than distributing excess funds as dividends to shareholders. This will allow them to increase the size of the company beyond its optimal size and expand their power over the firm for entrenchment purposes (Shleifer and Vishny, 1989).

Family Ownership and Investment Efficiency

Family firms have become a common form of organization in the modern economy (Shu et al. 2018). Following recent evidence of the heterogeneity of family firms (Labelle et al., 2018), the behavior of family members varies among family involvement within the company. Based on the agency theory and resource-based views, researchers argue that family ownership may bring both benefits and costs to the company (Sener, 2014).

Social Benefits of Family Controlled Firms

According to the resource-based view, family firms have unique abilities and resources that distinguish them from their non-family counterparts and lead them to have competitive advantages (García-Sánchez et al. 2018). Families have a sense of identity and strong emotional ties with the firm and attach considerable importance to their reputation in order to transfer their family inheritance to succeeding generations (Gottardo et al. 2019). In addition, family owners are likely to protect their ownership stake since they consider the company as a social capital to preserve (Colli, 2012) and an asset to be passed to future generations through succession (Berrone et al. 2012).

Recent studies investigate the benefits associated with family businesses. Gavana et al. (2017) and Martin et al. (2016) show that the concern with the family name's reputation leads to higher earnings quality and then less information asymmetry (Pindado et al. 2011). Consequently, the underinvestment issue may
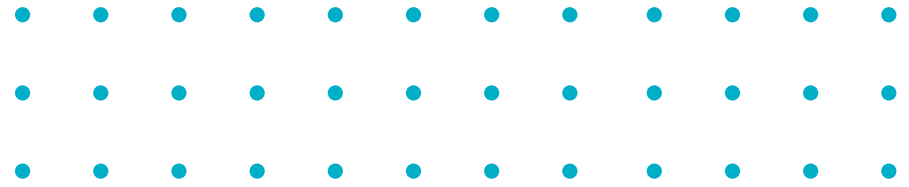
be mitigated in family-controlled firms. Moreover, Díaz-Díaz et al. (2016) suggest that family firms are considered better borrowers. There is also evidence that the cost of debt is lower (Ma et al. 2017), debt contract strictness is less severe (Hillier et al. 2018), and contracts are more favorable in terms of loan spread in family firms (Yen et al. 2015). This evidence suggests that family firms could reduce financial constraints and thereby, the problem of underinvestment (Pindado et al. 2011).

Furthermore, the literature pointed out the effect of the emotional connections that family owners feel for their business on the behavioral, social, psychological, and cognitive aspects of running the firm (Chirico and Salvato, 2008). Martín-ez-Ferrero et al. (2018) notice that family owners are regularly involved in the day-to-day activities and control managers more effectively than non-family businesses. Indeed, the long-term horizon of the family provides them incentives to maximize firm value. This is likely to mitigate the deviation from the optimal investment level (Morgado and Pindado, 2003). Supporting this argument, Caprio et al. (2011) argue that family businesses adopt conservative approaches regarding acquisitions and are less likely to overinvest by means of merger and acquisitions (Pindado et al. 2011).

Agency Costs of Family Controlled Firms

Conversely, the agency view provides opposite arguments regarding the behavior of family firms and their effects on investment decisions especially in weakly-legal environments (Kuo et al. 2012). The preceding literature argue that while family business might mitigate the classical agency problem between managers and shareholders, it gives rise to a new type of agency conflict between family members and minority shareholders (Villalonga and Amit, 2006). Supporting this view, Pindado et al. (2011) argue that family owners are likely to privilege their interests by undertaking projects that are inefficient for minority shareholders but beneficial to family members to extract private benefits (La Porta et al. 1999; Shleifer and Vishny, 1997). This leads to the over-investment problem. In this vein, Poulain-Rehm (2005) argues that the free cash-flow hypothesis of (1986) is in the heart of the agency relationships and shareholder value creation for managerial and family firms. The author documents that the presence of high free cash-flows in firms with low growth opportunities is a source of conflicts between shareholders and managers and leads to an overinvestment problem.

Family ownership is also linked to the under-investment problem due to the existence of asymmetric information. In this context, Patelli and Prencipe (2007) argue that family ownership concentration increases the informational gap between the founders and external shareholders. Family owners seek then to limit the flow of information to extract private benefits and expropriate minority shareholders (Wang, 2006). This information asymmetry might create financial constraints for the firm and affect the efficiency of investment. Accordingly, if shareholders do not have sufficient information to assess the quality of companies' projects, they will require a much higher premium to compensate for the level of risk bared (Stiglitz and Weiss, 1981). This argument hampers the ability of family firms to raise funds to invest and leads to underinvestment.

In addition, Kalm and Gómez-Mejía (2016) argue that the socio-emotional wealth is a main objective for family firms. Indeed, families are likely to preserve non-financial goals (Berrone et al. 2012). According to Chrisman et al. (2002), family-owned firms can undertake risky decisions that preserve their soci-oemotional wealth but mitigate their economic wealth in the long run. On the other hand, family owners can reject risky projects that maximize the economic value of the business because of the socioemotional wealth. In this sense, Gómez-Mejía et al. (2011) argue that the loss aversion of socioemotional wealth might hamper the investment efficiency in family businesses.

Another distinctive aspect of family owners is their altruistic behavior that refers to the desire of parents to take care of their children (Simon, 1993; Corbetta, and Salvato, 2004). However, the benefits of altruism may be offset by agency costs since parents' generosity can damage the children's behavior (Buchanan and Phelps, 1975). The latter can free ride, shirk, and make decisions that threaten the welfare of the family and the business (Schulze et al., 2003). This situation will exacerbate the agency costs in family firms and hence, investment efficiency will be affected.

The preceding discussion shows that there are two opposite theoretical assumptions about the relationship between family ownership and investment efficiency. The empirical evidence (e.g., Chen et al. 2017a) suggests that the institutional context can affect the relationship between ownership structure and investment efficiency. Hence, French listed companies are mostly fami-ly-controlled (Faccio and Lang, 2002 and Boubaker and Labegorre, 2008).

Besides, France is a civil law where investors' rights are weakly protected. We then assume then that agency costs in family-controlled firms in France should predominate their social benefits. This leads to the following hypothesis:

H_1: *Family ownership negatively affects investment efficiency.*

Excess Family Control

In family-controlled firms, the risk of expropriation of minority shareholders' interests is exacerbated in case of excess control by family members. Previous literature has broadly mentioned that family firms incur generally a separation between voting rights and cash flow rights through pyramids, shares with double and multiple voting rights and cross-shareholdings (Bae and Goyal, 2010). Excess control by family owners leads them to extract private benefits at the expense of minority shareholders (Claessens et al. 2002). Supporting this view, Anderson and Reeb (2003) notice that families have both the incentive and the ability to expropriate and to take actions that benefit themselves at the expense of firm performance when their voting rights exceed their cash flow rights. Accordingly, Masulis et al. (2009) document that the separation between voting rights and cash flow rights give rise to conflicts of interests between family members and minority shareholders. Families prefer to invest in negative NPV to extract rents at the expense of minority shareholders. This behavior leads to the overinvestment problem (Kuo and Hung, 2012). Moreover, Wei and Zhang (2008) show that the risk of expropriation is high for firms where there is a separation between voting and cash flow rights. This is likely to exacerbate the entrenchment effect by families and lead to the overinvestment problem.

In addition, Croci et al. (2011) argue that the separation between voting and control rights negatively affects debt and share issuance. Indeed, shareholders and debtholders are reluctant about acquiring shares from firms with excessive control because of the high risk of expropriation. Family firms with excess control are facing difficulties to finance investment opportunities by external funds because the latter become costly relative to internal funds giving rise to the underinvestment issue.

The preceding discussion suggests that the excess of control rights beyond cash flow rights exacerbates the expropriation risk of minority shareholders' interests and leads then to the following hypothesis:

H_2: *Family excess control negatively affects investment efficiency.*

CEO Family Member and Investment Efficiency

The literature documents that there are agency costs and drawbacks of family involvement in management (Schulze et al., 2003) which might be harmful to investment efficiency. Blanco-Mazagatos et al. (2016) suggest that family involvement in management may create a problem of self-control which makes it difficult for family managers to privilege the interests of external shareholders. Relying on the stewardship argument, Miller et al. (2013) argue that family managers hold the position of stewards of the family rather than of the business leading to low levels of firm performance. Burkart et al. (2003) document that the expropriation of minority interests is exacerbated when the CEO is a family member. This situation can lead family firms to engage in investments harmful to firm performance but providing private benefits for them. On the one hand, family firms would invest in negative NPV projects to accentuate their entrenchment within the company (Faccio and Lang, 2002 and Shleifer and Vishny, 1989). On the other hand, excessive power of families resulting in combining management and ownership can exacerbate information asymmetry (Miller and Le Breton-Miller, 2006) leading to the underinvestment problem.
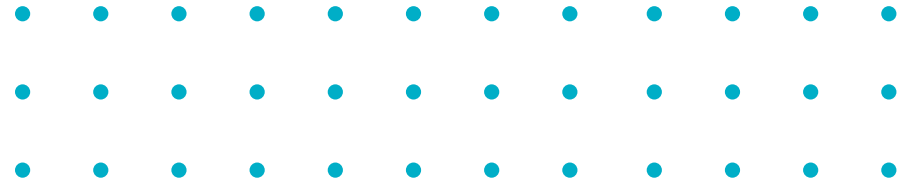
The preceding arguments show that family involvement in management negatively affects investment efficiency. Consequently, we formulate the following hypothesis:

H_3: *The CEO family member negatively affects investment efficiency.*

Family Generational stage and Investment Efficiency

The desire to transfer business control from one generation to another is one of the key factors that differentiates family firms from their non-family counterparts (Gomez-Mejia et al. 2011). Subsequently, the firm's generational stage may be a determinant factor of investment efficiency in family held companies.

In the recent literature, Gottardo et al. (2019) admit that families' conflicts are less likely to occur in the first generational stage due to strong emotional ties between family members (Le Breton Miller and Miller, 2013). However, in later generational stages, family bonds are weaker (Blanco-Mazagatos et al. 2016), different family branches emerge and may be conflicting (Voordeckers et al. 2007). This is likely to diverge family members objectives and to increase

information asymmetry (Blanco-Mazagatos *et al.* 2016). In addition, the weakness of family ties lessens the incentives of family owners to exert efforts in promoting cooperation which gives rise to opportunistic behavior (Fama and Jensen, 1983). Supporting this view, Blanco-Mazagatos *et al.* (2016) suggest that agency conflicts are higher for family firms in second generations. Family members from later generations are likely to pursue personal perks (Miller and Le Breton-Miller, 2006), consume non-pecuniary benefits or use resources in unprofitable investments in which they have private benefits (Siebels and zu Knyphausen-Aufseß, 2012). At this stage, investment efficiency may be compromised.

Moreover, Blanco-Mazagatos *et al.* (2007) state that family firms from following generations have increased information asymmetry which might be detrimental for firm's growth. Anderson and Reeb (2003) suggest that bondholders consider the transfer of a family business from the founder to the next generation as harmful to their wealth since agency costs may arise due to information asymmetries between family members and bondholders (Molly *et al.* 2012). In that sense, the under-investment problem is likely to arise due to financial constraints.

The preceding arguments show that family firms from successive generations may have a detrimental effect on investment efficiency. Consequently, we assume the following hypothesis:

H_4: *Family Generational stage negatively affects investment efficiency.*

The Moderating Effect of Financial Analyst Coverage on Investment Efficiency in Family firms

The negative effect of family control on investment efficiency is driven by agency costs and information asymmetry. Hence, governance devices are important to counteract opportunistic behavior in family held companies. Financial analysts, one of the most important external governance devices (Chen *et al.* 2017b) seem to be able to address this issue in several ways. Sun and Liu (2016) suggest that analyst coverage enhances the monitoring of managers by mitigating the information asymmetry problem. Indeed, as financial intermediaries, analysts can provide market participants with information about the firms' future prospects (Kelly and Ljungqvist, 2012). According to Lang *et al.* (2004), financial analysts are considered as independent monitors. They analyze public information and seek private information by interacting directly with management (Yu, 2008).

This is likely to hamper managerial ability to engage in suboptimal investments (Bowen *et al.*, 2008).

In addition, Derrien and Kecskès (2013) show that analysts exert a monitoring on the company leading to a decrease in the cost of financing and an increase in the level of investment. Miller (2006) argues that financial analysts enhance the efficiency of the external monitoring system by controlling managers through their forecasts and buy and sell recommendations. In addition, by providing earnings forecast, analysts interact with managers. This gives financial analysts the power to properly monitor the firm and subsequently influence its decision-making (Yu, 2008 and Chen *et al.* 2017b). Financial analyst coverage is then considered as a disciplinary mechanism as it pressures managers to better allocate their resources and choose optimal investments strategies. Recently, Brogaard *et al.* (2019) show that analyst's coverage improves the efficiency of investments.

Obviously, the arguments remain valid in the context of family firms. Eugster (2019) suggests that that analyst coverage is strongly related to ownership concentration. The monitoring and information intermediary role of financial analysts will guide family owners' efforts towards an optimal allocation of resources. This would mitigate the problem of information asymmetry in family firms. Analysts' reports and earnings forecasts are used to provide new information to external investors (Chen *et al.* 2010). In addition, as an external governance device, analyst coverage helps reducing the problem of financial constraints faced by family firms, and thus decreasing the problem of underinvestment.

Accordingly, we assume that the number of analysts following the firm will enhance the efficiency of investments in family firms. Our hypothesis is then as follows:

H_5: *The negative effect of family control on investment efficiency is less prevalent in presence of high analyst coverage.*

Research Design

Sample and Data

Our sample covers French companies included in the CAC all shares index from 2013 to 2018. We begin with a sample of 461 firms. We exclude from our sample 89 financial companies because of their specific financial characteristics. We also remove companies with missing data (201). After matching the databases, we

are left with a final sample of 139 companies over a period of 6 years, i.e. a total of 834 observations.

Data on family ownership were hand-collected form annual reports retrieved from the AMF website (Financial Market Authorities). Financial and accounting data were extracted from the "Compustat" database. Data on financial analysts were collected from the "DataStream" database.

Variables and Model Specification

To test the effect of family control on investment efficiency, we use a model based on the investment response to investment opportunities as a measure of investment efficiency. This measure is the investment-Q sensitivity that links total investment with Tobin's Q (Chen *et al.* 2017a). Tobin (1969) documents that if the market value of assets is higher than its replacement value, a firm should increase its investment leading to a greater investment-Q sensitivity (Foucault and Frésard, 2012). We use the basic model presented below to measure investment efficiency.

$$Inv_{it} = \alpha_0 + \alpha_1 MTB_{i,t-1} + \alpha_2 CF0_{i,t} + \alpha_3 Lev_{i,t-1} + \alpha_4 Growth_{i,t-1} + \alpha_5 Size_{i,t-1} + \varepsilon_t \qquad (1)$$

The dependent variable Inv_{it} is total investments. It is calculated as the sum of capital expenditures (Capex), research and development expenses and acquisitions. This measure captures different types of investments and is commonly used in literature (Goodman *et al.* 2014). The $MTB_{i,t-1}$ variable is the Market-to-Book ratio that measures the investment opportunity. It is calculated by the ratio of the market value of assets on their book value.

We include control variables as follows:

Operating cash flow (CF0): is the cash flow from the business activity. Fazzari el al. (1988) argue that in an imperfect market, the cost of internal funds is lower than that of external funds, which leads companies to rely more on cash flow to finance their investments. In addition, a high level of cash flow provides more financial resources to the company (Chen *et al.* 2011).

Leverage (Lev): is the leverage ratio, it is measured by the ratio of total debt to total debt and equity. Myers (1977) and Biddle *et al.* (2009) argue that companies with a high level of debt are more likely to suffer from a problem of excessive debt that forces them to under-invest. In addition, companies with too much debt pay more interest and are less likely to obtain more debt for financing, which hampers their investment capacity.

Growth: is sale's growth. Companies with a high level of sales growth are having more opportunities for growth and to invest more (Goodman *et al.*, 2014).

Firm size (Size): is the size of the firm that is measured by the log of total assets. It is associated with financial constraints, as larger firms have more resources for investment and easier access to the capital market (Chen *et al.* 2011).

To control the effect of unobservable business characteristics on investment spending, we use GLS regressions with year and industry fixed effects. We test the following model:

$$Inv_{it} = \alpha_0 + \alpha_1 (MTB_{it-1}) + \alpha_2 (MTB_{it-1} * Fam\text{-}Var) + \alpha_3 Fam\text{-}Var + \alpha_4 CF0_{it} + \alpha_5 Lev_{it-1} + \alpha_6 Growth_{it-1} + \alpha_7 Size_{it-1} + \varepsilon_t \qquad (2)$$

With:

Fam-Var: is either family ownership, excess control, the CEO family member or family generational stage.

(MTBit-1 * Fam-Var) is the interaction term between investment opportunities and family variables to test the effect of family control on the investment-Q sensitivity.

As for the moderating effect of financial analysts, we test the following model:

$$Inv_{it} = \alpha_0 + \alpha_1 MTB_{it-1} + \alpha_2 MTB_{i(t-1)} * Fam\text{-}Var_{it} + \alpha_3 Fam\text{-}Var_{it} + \alpha_4 MTB_{i(t-1)} * analyst_{it} + \alpha_5 MTB_{it-1} * Fam\text{-}Var_{it} * analyst_{it} + \alpha_6 CF0_{it} + \alpha_7 Lev_{it-1} + \alpha_8 Growth_{it-1} + \alpha_9 Size_{it-1} + \varepsilon_t \qquad (3)$$

This model includes an interaction term between investment opportunities, family variables and the number of analysts following the firm.

Results and Discussion

Descriptive Statistics

Table 1 presents the descriptive statistics. The dependent variable "investment" is the logarithm of total capital expenditures, research and development and acquisitions. It displays an average value of 4.74 (which is equivalent to 105.77

million Euros). We also notice that, on average, French companies have a Market-to-Book ratio of 2.074 suggesting that investors overvalue French firms by assigning on average a higher value for companies than their book value. Table 1 also shows that family firms represent 40% of the total sample controlling on average of 48% of the share capital. In addition, 52% of family firms hold control rights beyond their cash flow rights and 62% of family firms are run by a family member, which implies that most families are involved within management. Also, 70% of family firms are in second or more generational stage. Regarding the number of financial analysts covering companies, Table 1 shows that French companies are covered on average by 11 financial analysts. For control variables, French companies have an average debt level of 60% and an average sales growth rate of 13%.

Table 2 shows the Pearson correlation matrix of our selected variables. The correlation coefficients between family variables (family dummy, family ownership, excess control, CEO family member, and the generational stage) vary between 0.04 and 0.9 and are significant at the 5% level. This means that family

TABLE 1
Descriptive Statistics

Table 1 illustrates descriptive statistics for a sample of 139 firms over a 6-year period. Investment is the natural logarithm of the sum of capital expenditure, R & D expenditure, and acquisition. MTB is the ratio Market to Book value. Fam-Own is the percentage of ownership owned by the family. Analyst is the number of analysts who cover the company. CFO is operating cash flow. Leverage is total debt to total assets. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. Family is a dummy variable that takes the value of 1 if the family is the main shareholder in the company and 0 otherwise. Excess is a dummy variable that takes the value of 1 if the ratio of voting rights on property rights is greater than the average of the distribution and 0 otherwise. Fam-CEO is a dummy variable that takes the value of 1 if a family member holds the CEO position and 0 otherwise. Generation is a dummy variable that takes the value of 1 if the age of family's firm is more than 30 years and 0 otherwise.

	Mean	St. Dev.	Minimum	Maximum
Investment	4.7445	2.3417	-1.5050	11.4960
MTB	2.0747	1.6994	-6.38	16.3
Fam-Own	48.921	16.996	10.14	79.93
Analyst	11.016	9.5406	0	36
CFO	0.0578	0.1065	-0.7954	0.6832
Leverage	0.6031	0.2688	0.0617	3.4587
Growth	0.1294	1.0608	-0.9455	19.042
Size	7.5507	2.3392	-0.0904	14.0394
Dummy variables				
	Proportion (1)		Proportion (0)	
Family	0.3956		0.6043	
Excess	0.5181		0.4818	
Fam-CEO	0.6181		0.3818	
Generation	0.7026		0.2973	

TABLE 2
Pearson correlation Matrix

Table 2 displays the Pearson correlation matrix for a sample of 139 firms over a 6-year period. Investment is the natural logarithm of the sum of capital expenditure, R & D expenditure, and acquisition. MTB is the ratio Market to Book value. Fam-Own is the percentage of ownership owned by the family. Analyst is the number of analysts who cover the company. CFO is operating cash flow. Leverage is total debt to total assets. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. Family is a dummy variable that takes the value of 1 if the family is the main shareholder in the company and 0 otherwise. Excess is a dummy variable that takes the value of 1 if the ratio of voting rights on property rights is greater than the average of the distribution and 0 otherwise. Fam-CEO is a dummy variable that takes the value of 1 if a family member holds the CEO position and 0 otherwise. Generation is a dummy variable that takes the value of 1 if the age of family's firm is more than 30 years and 0 otherwise. * is statistical significance at the 5% level.

|	Investment	MTB	Family	Fam-Own	Excess	Fam-CEO	Genration	Analyst	CFO	Leverage	Growth
Investment	1										
MTB	0.0426	1									
Family	-0.0266	0.0369	1								
Fam-Own	-0.0883*	0.0523	0.9092*	1							
Excess	0.0559	0.0640	0.6345*	0.4576*	1						
Fam-CEO	-0.2199*	-0.1064*	0.7032*	0.6901*	0.3669*	1					
Generation	0.2667*	-0.0566	0.1509*	0.1724*	0.0435	0.0529	1				
Analyst	0.7928*	0.0642*	-0.0007	-0.1114*	0.0879*	-0.1926*	0.2339*	1			
CFO	0.2403*	-0.1091*	0.1846*	0.1869*	0.1125*	0.0703*	0.2160*	0.1350*	1		
Leverage	0.1201*	-0.2291*	-0.0844*	-0.0960*	0.0110	-0.0672	0.1502*	0.1011*	0.1470*	1	
Growth	-0.0529	0.1398*	-0.0325	-0.0355	-0.0223	-0.0136	-0.1166*	-0.0546*	-0.1500*	-0.0436	1
Size	0.8570*	-0.0711*	-0.0019	-0.0932*	0.0591	-0.1499	0.3413*	0.7898	0.2831*	0.2174*	-0.078

variables are correlated. To overcome the multicolinearity problem, we include these variables separately in our regressions to avoid biased results.

Results and Discussion

Table 3 presents the results using GLS regressions with industry and firm fixed effects. The coefficient α_1 measures the investment-Q sensitivity. This coefficient is positive and statistically significant at the 1% level for all regressions indicating a positive relationship between investment and investment opportunities in French companies. This finding is similar to those reported by Chen et al. (2011),

Biddle et al. (2009), Goodman et al. (2014), Chen et al. (2017a) and Richardson (2006) supporting Modigliani and Miller (1958) who assume that investment can only be driven by the investment opportunity measured by Tobin's Q (1969).

Table 3 also shows that the relation between the interaction term (MTB and family ownership) and the investment variable is negative and statistically significant at the 5% level. This finding shows that family ownership negatively affects the investment-Q sensitivity. Our family dummy variable is also negative and statistically significant suggesting that family firms are associated with less investment efficiency. This finding supports our first hypothesis H_1. Table 3
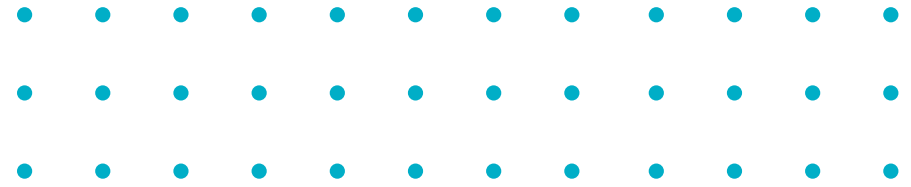
shows that the coefficient α_1 of the MTB variable is equal to 0.1428 (model (1)) but the coefficient (α_3) of the interaction variable between Market to Book and family firms (binary variable) is equal to -0.0415 (model (1)).The magnitude of the coefficients indicates that the association between investment and investment opportunity in family firms is 29.06% lower (-0.0415/ 0.1428) than their non-family counterparts. Similarly, using the proportion of shares held by family firms, an increase in family participation results in a decrease in the investment-Q sensitivity. This finding suggests that family firms invest more than their investment opportunities, and / or do not reduce their investments when investment opportunities are low. This result also implies that family firms do not invest when investment opportunities are high. In other words, the negative investment-Q sensitivity in family firms is due to either an over-investment or an underinvestment problem.

The third column of table 3 includes the interaction variable between MTB and excess family control. The results show that excess control by family firm negatively affects the investment-Q sensitivity at the level of 5%. This means that the investment response to investment opportunity decreases when the family has an excess of control suggesting that family firms with voting rights beyond their cash flow rights invest inefficiently. Therefore, we support our second hypothesis H_2. Particularly, the magnitude of the relationship between excess family control and investment efficiency is stronger than that with family ownership (-0.093 compared to -0.0011). This means that the negative effect of family firms on investment efficiency is more prevalent when the firm holds control rights beyond their cash flow rights.

Column 4 of Table 3 shows the results on the CEO family member variable. The results show that the latter is not significantly associated with the level of investment efficiency, rejecting our third hypothesis. Finally, the results show that family generational stage negatively affects the investment-Q sensitivity at the level of 1% (Column 5 of Table 3). This finding suggests that family firms in later generational stages harm investment efficiency, and that the investment response to investment opportunity decreases when the family is in the second or more generational stages. This unique result supports our fourth hypothesis H_4.

As for the effect of control variables on investment efficiency, results on Table 3 (Models (1) to (5)) show that cash flows from operations have a positive and significant effect on investments. A high level of cash flow indicates large financial resources, leading to a higher level of investment. These results are consistent with the study of Chen et al. (2011) and Richardson (2006). Alternatively, Chen et al. (2017a) suggest that market imperfections make firms more dependent on internal resources to finance their investments and this indicates that a positive relationship exists between cash flows and investment. Leverage has a negative and statistically significant effect on investments suggesting that debt financing hampers company's investments. This result is consistent with Pindado et al. (2011) and suggests that leverage acts as a monitoring device that mitigates investment in unprofitable projects. Our results also show that firm size is positively and significantly associated with investment spending supporting Chen et al. (2011) and Goodman et al. (2014). This finding suggests that larger firms spend more on investments because they have more resources to finance their investments.

We follow previous studies (Morgado and Pindado 2003; Pawlina and Renneboog 2005 and Kuo and Hung 2012) and distinguish now between companies that are under-investing and those that are overinvesting using investment opportunity. Indeed, the overinvestment problem is more severe in low Tobin's-Q companies, as these companies lack opportunities with positive net present value but are investing to extract private profits. However, the problem of underinvestment is more severe in high Tobin's Q firms that have investment opportunities but are suffering from financial constraints.

We divide our sample into 2 sub-samples: the first sub-sample covers companies with low MTB (below the median) and the second sub-sample covers companies with high MTB (above the median). Table 4 shows the results for both sub-samples. For the low MTB sub-sample, the results show that the effect of family variables on investment efficiency is not statistically significant. This means that family firms are not concerned about the overinvestment problem. However, in high MTB regressions, the relationship between the interaction term between MTB and family variables (Family ownership, excess control, generational stage) is negative and statistically significant. These findings suggest that the negative effect of family control on investment efficiency is due to the problem of under-investment supporting the agency theory perspective. Indeed, family firms are associated with information

TABLE 3
The effect of family control on investment efficiency

Table 3 illustrates panel data regression using GLS regressions with industry and firm fixed effects for a sample of 139 firms over a 6-year period. Investment is the natural logarithm of the sum of capital expenditure, R & D expenditure, and acquisition. Family is a dummy variable that takes the value of 1 if the family holds more than 10% of firm's voting rights and 0 otherwise. Fam-Own is the percentage of shares held by the family. Excess is a dummy variable that takes the value of 1 if the ratio of voting rights on cash-flow rights is greater than the average of the distribution and 0 otherwise. Fam-CEO is a dummy variable that takes the value of 1 if a family member holds the CEO position and 0 otherwise. Generation is dummy variable that takes the value of 1 if the age of family's firm is more than 30 years and 0 otherwise. MTB is the ratio Market to Book value. Analyst is the number of analysts who cover the company. CFO is operating cash flow. Leverage is total debt to total assets. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. *, **, *** are statistical significance at the 10%, 5% and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
MTB	0.1428	0.1450	0.1525	0.1043	0.1876
	(8.23)***	(8.27)***	(9.45)***	(7.93)***	(7.36)***
Family	-0.1327				
	(-2.03)*				
MTB*Family	-0.0415				
	(-1.54)**				
Fam-Own		-0.0018			
		(-1.46)			
MTB*Fam-Own		-0.0011			
		(-2.12)**			
Excess			-0.0302		
			(-0.44)*		
MTB*Excess			-0.0932		
			(-2.44)**		
Fam-CEO				-0.5252	
				(-5.99)***	
MTB*Fam-CEO				0.0607	
				(1.48)	
Generation					0.0958
					(1.63)
MTB*Genretaion					-0.0905
					(-2.99)***
CFO	0.7163	0.6976	0.5425	0.5631	0.5437
	(3.39)***	(3.36)***	(2.62)***	(2.87)***	(2.39)**
Leverage	-0.5570	-0.5095	-0.4614	-0.7063	-0.4720
	(-5.02)***	(-4.60)***	(-3.99)***	(-6.45)***	(-4.23)***
Growth	0.0012	0.002	0.0033	0.0071	-0.0071
	(0.08)	(0.14)	(0.09)	(0.25)	(-0.25)
Size	0.8955	0.8980	0.9063	0.8838	0.9093
	(97.09)***	(99.26)***	(103.87)***	(106.27)***	(102.38)***
Constant	-1.869	-1.9264	-2.0566	-1.5903	-2.1321
	(-18.09)***	(-18.64)***	(-22.22)***	(-18.02)***	(-19.44)***
Year and Industry FE	Yes	Yes	Yes	Yes	Yes
N	834	834	834	834	834
R^2	74.89%	74.59%	74.58%	75.33%	74.62%

TABLE 4
Regression results for overinvestment and under-investment subsamples

Table 4 reports panel data regression results for overinvestment (Panel A) and under-investment (Panel B) subsamples. Investment is the natural logarithm of the sum of capital expenditure, R & D expenditure, and acquisition. Fam-Own is the percentage of shares held by the family. Excess is a dummy variable that takes the value of 1 if the ratio of voting rights on cash-flow rights is greater than the average of the distribution and 0 otherwise. Fam-CEO is a dummy variable that takes the value of 1 if a family member holds the CEO position and 0 otherwise. Generation is a dummy variable that takes the value of 1 if the age of family's firm is more than 30 years and 0 otherwise. MTB is the ratio Market to Book value. CFO is operating cash flow. Leverage is total debt to total assets. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. *, **, *** are statistical significance at the 10%, 5% and 1% levels respectively.

Panel A: Low Tobin's Q				
Variables	(1)	(2)	(3)	(4)
MTB	-0.0024	0.1758	0.0326	0.1828
	(-0.05)	(2.35)**	(0.69)	(3.08)***
Fam-Own	-0.0090			
	(-4.51)***			
MTB*Fam-Own	0.0059			
	(4.12)			
Excess		0.0895		
		(0.77)		
MTB*Excess		-0.1333		
		(-1.48)		
Fam-CEO			-0.5395	
			(-3.84)***	
MTB*Fam-CEO			0.1952	
			(1.78)	
Generation				0.0799
				(0.82)
MTB*Generation				-0.1866
				(-2.45)
CFO	3.5896	3.6834	3.7266	3.6735
	(6.99)***	(6.58)***	(6.78)***	(7.04)***
Leverage	-0.1752	-0.1510	-0.2888	-0.3641
	(-1.38)	(-1.16)	(-2.02)**	(-2.84)***
Growth	0.0016	0.0019	0.0014	0.0011
	(1.85)*	(2.03)**	(1.51)	(1.32)
Size	0.9093	0.9243	0.9076	0.9198
	(80.95)***	(81.16)***	(76.32)***	(87.06)***
Constant	-2.3621	-2.7001	-2.2551	-2.5003
	(-15.94)***	(-17.84)***	(-15.13)***	(-18.82)***
Year and Industry FE	Yes	Yes	Yes	Yes
N	305	305	305	305
R^2	43.18%	43.12%	43.84%	43.84%

asymmetry issues. Hence, Wang (2006) and Patelli and Prencipe (2007) often associate family control with a very high level of opacity. This means that information asymmetry issues are exacerbated in French family firms which leads them to miss investment opportunities.

We now examine the moderating effect of analyst coverage as an external corporate governance device and information intermediary, on investment efficiency of family firms. Table 5 shows that the interaction variable between Market-to-Book and the financial analysts is positively associated with investments suggesting that analyst coverage is a driver for companies to invest in response to the investment opportunity and subsequently, enhances investment efficiency in French companies. Then, we include in our model a triple interaction term between Market-to-Book, family control and the number of analysts following the firm. This variable measures the impact of financial analysts' coverage on investment efficiency of family firms. The results in Table 5 show that the interaction coefficients remain negative for all family variables' models. However, the negative effect of family control on investment efficiency decreases and becomes statistically insignificant in highly-followed firms. This result suggests that financial analysts are able to mitigate the negative effect of family control on investment efficiency. Analysts can limit the deviation of the company's investment from inefficient investment. As information intermediaries, financial analysts manage to mitigate information asymmetry in family firms. This is consistent with the study of Chang et al. (2006) who show that analyst's coverage improves the flexibility of financing policies, which mitigates the problem of underinvestment. In addition, as an external governance device, the monitoring role exerted by financial analysts leads to a decrease in conflicts of interests between large and minority shareholders in family firms.

This finding suggests that the negative relationship between family control and investment efficiency is less prevalent when the firm is followed by a large number of financial analysts. However, the weak impact of financial analysts on the relationship between family control and investment efficiency is due to the nature of the French legal context, which offers discretion to the majority shareholders to act freely at the expense of minority shareholders. This prevents financial analysts from effectively carrying out their monitoring role on managers.

Robustness check

Alternative Measure of Investment: Capex

We use capital expenditures as an alternative measure of investment expenses following Biddle et al. (2009), Chen et al. (2017b) and Chen et al. (2017a). Table 6 reports the results using this new proxy for investment. The results remain qualitatively unchanged and show that family control has a negative and significant effect on investment efficiency.

Alternative measure of investment efficiency

We use an alternative measure of investment efficiency that is the deviation from the optimal level of investment extensively used in previous literature by Biddle et al. (2009), Richardson (2006), Goodman et al. (2014) and McNichols et al. (2008). We estimate the expected investment using the model of Richardson (2006) and Goodman et al. (2014):

$$\text{Inv}_{it} = \alpha_0 + \alpha_1 \text{MTB}_{i(t-1)} + \alpha_2 \text{CFO}_{it} + \alpha_3 \text{Growth}_{i(t-1)} + \alpha_4 \text{Leverage}_{i(t-1)} + \alpha_5 \text{Size}_{i(t-1)} + \varepsilon_t \quad (4)$$

The residuals are the unexpected investment, a proxy of deviation from the optimal level of investment. We follow Biddle et al. (2009) and consider observations in the bottom quartile as "underinvestment" and observations in the top quartile as "over-investment". Subsequently, we generate a binary variable "over-invest" which takes the value of 1 if the observation on residuals is in the upper quartile, and 0 otherwise, and another binary variable "under-invest" which takes the value of 1 if the observation is in the lower quartile, and 0 otherwise.

Following Biddle et al. (2009), we examine whether family variables are associated with a large gap between actual investment and expected investment. Specifically, we test whether family variables are negatively associated with investment spending when the firm is more likely to underinvest. To do so, we test the following model:

$$\text{Inv}_{it} = \alpha_0 + \alpha_1(\text{Fam-Var}_{it}*\text{underinvest}_{it}) + \alpha_2 \text{Fam-Var}_{it} + \alpha_3 \text{underinvest}_{it} + \alpha_4 \text{CFO}_{it} + \alpha_5 \text{Leverage}_{i(t-1)} + \alpha_6 \text{Growth}_{i(t-1)} + \alpha_7 \text{Size}_{i(t-1)} + \varepsilon_t \quad (5)$$

With Fam-Var is either family ownership, excess control, CEO family member, or family generational stage.

TABLE 5
The Moderating effect of Financial Analysts' coverage

Table 5 illustrates the panel data regression results for a sample of 139 firms over a period of 6 years. Investment is the natural logarithm of the sum of capital expenditure, R & D expenditure, and acquisition. Fam-Var: is either family ownership, excess control, the CEO family member, or the generation. Family is a dummy variable that takes the value of 1 if the family holds more than 10% of firm's voting rights and 0 otherwise. Fam-Own is the percentage of shares held by the family. Excess is a dummy variable that takes the value of 1 if the ratio of voting rights on cash-flow rights is greater than the average of the distribution and 0 otherwise. Fam-CEO is a dummy variable that takes the value of 1 if a family member holds the CEO position and 0 otherwise. Generation is a dummy variable that takes the value of 1 if the age of family's firm is more than 30 years and 0 otherwise. MTB is the ratio Market to Book value. Analyst is the number of analysts who cover the company. CFO is operating cash flow. Leverage is total debt to total assets. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. *, **, *** are statistical significances at the 10%, 5% and 1% levels.

Variables	Family	Fam-Own	Excess	Fam-CEO	Generation
MTB	0.0890	0.1014	0.0952	0.0712	0.0961
	(3.43)***	(3.91)***	(3.95)***	(3.00)***	(2.90)***
MTB*Fam-Var	-0.0896	-0.0023	-0.0045	0.0033	-0.0394
	(-2.04)**	(-2.58)***	(-1.66)*	(0.06)	(-0.96)*
Fam-Var	-0.0066	0.0003	0.0708	-0.4732	0.1607
	(-0.09)	(0.27)	(1.00)	(-4.67)***	(2.29)**
MTB*Analyst	0.0079	0.0066	0.0064	0.0036	0.0131
	(5.00)***	(4.20)***	(4.53)***	(2.81)***	(6.58)***
MTB*Fam-Var*Analyst	-0.0025	-0.0000	-0.0001	0.0042	-0.0091
	(-1.37)	(-0.27)	(-1.31)	(1.78)*	(-4.44)
CFO	0.8566	0.8082	0.5914	0.5470	0.4899
	(3.61)***	(3.45)***	(2.61)***	(2.48)**	(1.98)**
Leverage	-0.4088	-0.3577	-0,3063	-0.4879	-0.2660
	(-3.52)***	(-3.07)***	(-2.63)***	(-4.15)***	(-2.39)**
Growth	0.0083	0.0072	0.0090	0.0064	-0.0043
	(0.57)	(0.41)	(0.75)	(0.36)	(-0.10)
Size	0.8601	0.8631	0.8662	0.8624	0.8706
	(63.01)***	(61.55)***	(65.01)***	(63.97)***	(64.91)***
Constant	-1.7593	-1.8227	-1.8878	-1.5833	-2.0411
	(-13.59)***	(-14.01)***	(-15.95)***	(-13.29)***	(-15.40)***
Year and Industry FE	Yes	Yes	Yes	Yes	Yes
N	834	834	834	834	834
R^2	75.60%	75.57%	75.32%	76.05%	75.54%

TABLE 6
Alternative Measure of Investment: Capex

Table 6 illustrates panel data regressions fo a sample of 139 firms over a 6-year period. Capex is equal to capital expenditure reported by the company's tangible fixed assets (PPE). Family is a dummy variable that takes the value of 1 if the family holds more than 10% of firm's voting rights and 0 otherwise. Fam-Own is the percentage of shares held by the family. Excess is a dummy variable that takes the value of 1 if the ratio of voting rights on cash-flow rights is greater than the average of the distribution and 0 otherwise. Fam-CEO is a dummy variable that takes the value of 1 if a family member holds the CEO position and 0 otherwise. Generation is a dummy variable that takes the value of 1 if the age of family's firm is more than 30 years and 0 otherwise. MTB is the ratio Market to Book value. Analyst is the number of analysts who cover the company. CFO is operating cash flow. Leverage is total debt to total assets. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. *, **, *** are statistical significance at the 10%, 5% and 1% levels respectively.

Variables	(1)	(2)	(3)	(4)	(5)
MTB	0.0898	0.0357	0.0870	0.0497	0.0681
	(3.91)***	(2.28)***	(3.71)***	(2.78)***	(3.31)***
Family	-0.1234				
	(-1.98)*				
MTB*Family	-0.1334				
	(-6.56)***				
Fam-Own		-0.0020			
		(-1.51)			
MTB*Fam-Own		-0.0095			
		(-3.75)***			
Excess			-0.1091		
			(-1.68)*		
MTB*Excess			-0.1296		
			(-6.37)***		
Fam-CEO				-0.7251	
				(-6.32)*	
MTB*Fam-CEO				-0.1161	
				(-3.96)	
Generation					0.1053
					(1.83)*
MTB*Genretaion					-0.1432
					(-3.78)***
CFO	0.0371	0.0172	0.0353	0.0145	0.0467
	(7.33)***	(2.43)***	(6.91)***	(2.55)**	(7.55)***
Leverage	-0.4398	-0.2599	-0.4548	-0.2216	-0.4687
	(-4.38)***	(1.68)***	(-3.95)***	(-1.58)	(-4.02)
Growth	-0.1076	-0.0942	-0.1115	-0.0701	-0.1243
	(-1.18)	(-0.98)	(-1.21)	(-0.72)	(-1.35)
Size	-0.0980	-0.0982	-0.0936	-0.0901	-0.0989
	(-9.42)***	(-9.47)***	(-8.48)***	(-7.40)***	(-8.76)***
Constant	1.0764	1.0632	1.0706	1.0591	1.0899
	(9.06)***	(7.87)***	(8.97)***	(7.73)***	(9.56)***
Year and Industry FE	Yes	Yes	Yes	Yes	Yes
N	834	834	834	834	834
R2	75.03%	74.80%	74.73%	72.21%	75.12%

TABLE 7
The Moderating effect of Financial Analysts' coverage

Table 7 illustrates the panel data regression result by the GLS method. Investment is the natural logarithm of the sum of capital expenditure, R & D expenditure, and acquisition. Under-invest is a dummy variable that takes the value of 1 if the observation of residuals is in the bottom quartile and 0 otherwise. Fam-Var: is either family ownership, excess control, CEO family member or generation. Family is a dummy variable that takes the value of 1 if the family holds more than 10% of firm's voting rights and 0 otherwise. Fam-Own is the percentage of shares held by the family. Excess is a dummy variable which takes the value of 1 if the ratio of voting rights on cash-flow rights is greater than the average of the sample and 0 otherwise. Fam-CEO is a dummy variable which takes the value of 1 if one family member occupies the position of general manager and 0 otherwise. Generation is a dummy variable that takes the value of 1 if the age of family's firm is more than 30 years and 0 otherwise. CFO is the operating cash flow. Leverage is the ratio of debt to the sum of debt and equity. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. The figures in parentheses are the calculated t. *, **, ***: the coefficients are significant at the respective thresholds of 10%, 5%, 1%.

| Variables	Family	Fam-Own	Excess	Fam-CEO	Generation
Fam-Var*Under-invest	-0.9067	-0.0172	-0.0576	-0.8651	-1.00834
	(-15.69)***	(-11.78)***	(-7.70)***	(-12.78)***	(-21.49)***
Fam-Var	0.2567	0.0061	0.0256	0.0309	0.1339
	(6.27)***	(7.51)***	(7.83)***	(0.59)	(3.33)***
Under-invest	-1.1098	-1.1661	-1.2284	-1.1223	-0.8923
	(-30.69)***	(-33.53)***	(-35.98)***	(-30.57)***	(-24.44)***
CFO	0.6330	0.6146	0.5829	0.7433	0.4453
	(3.38)***	(3.23)***	(3.12)***	(4.26)***	(2.47)**
Leverage	-0.7688	-0.7150	-0.6915	-.0.7813	-0.7862
	(-8.49)***	(-7.88)***	(-7.81)***	(-9.42)***	(-8.88)***
Growth	0.0005	0.0005	0.0005	0.0005	0.0001
	(1.16)	(1.14)	(1.11)	(1.25)	(0.42)
Size	0.8452	0.8450	0.8422	0.8398	0.8519
	(119.11)***	(110.86)***	(109.65)***	(104.81)***	(98.36)***
Constant	-0.7369	-0.7718	-0.7417	-0.6083	-0.7833
	(-9.51)***	(-9.74)***	(-9.48)***	(-7.86)***	(-9.87)***
Year and Industry FE	Yes	Yes	Yes	Yes	Yes
N	834	834	834	834	834
R2	85.05%	85.01%	84.72%	85.07%	86.06%
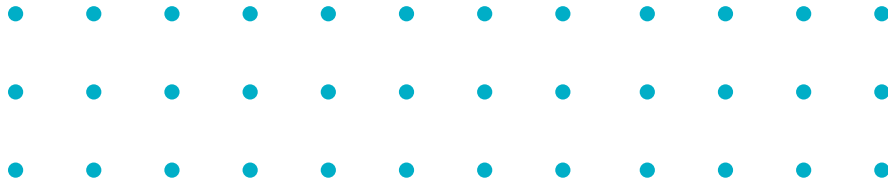
Table 7 shows that for all family variables the relationship between family control and investment spending is negative and statistically significant when the firm is underinvesting. These findings are similar with our main results and suggest that family control are likely to underinvest.

We also examine whether family control is associated with a high probability that the company is over or underinvesting. We estimate logistic regressions using dummy dependent variables "over-invest" and "under-invest" in order to test whether family control is more associated with the probability to over or to underinvest. Panel A of Table 8 reports the results on the underinvestment subsample. It shows that family firms are associated with the problem of underinvestment supporting our previous findings.

Conclusion

The purpose of this study is to investigate the effect of family control on investment efficiency. Based on a sample of 139 French companies from 2013 to 2018 and Generalized Least Squares estimations, the findings show that family ownership negatively affects investment efficiency. This relationship is more prevalent when the family holds voting rights beyond their cash flow rights and is in a successive generational stage. These findings suggest that family control affects the resource allocation behavior and undermines the efficiency of investment in French companies. We also show that suboptimal investments are due to the underinvestment problem in family firms. This finding suggests that exacerbated information asymmetry in family businesses leads them to miss investment opportunities due to high external cost of financing.

The results also show that, as an external corporate governance device, analyst coverage reduces the problem of inefficient investments in family firms. These findings support the view that financial analysts help mitigating the friction of information asymmetry and ensuring optimal resources allocation in French companies. The results are robust to alternative measures of investment and investment efficiency. Our results have important implications for investors and managers by providing new evidence on how family control harms investment efficiency in the French context and understanding the role of analysts in enhancing the firm informational environment and then, the investment process in family companies.

Our study suffers from some limitations. Firstly, we do not examine the effect of internal corporate governance devices i.e. the board of directors which could have a significant impact on investment decisions in family firms and particularly, outside directors. Recently, Uhlaner *et al*. (2020) argue that external directors play an important role to offset information asymmetry and are beneficial to firm performance. However, they identify boundary conditions for which outside directors have a negative effect on board's engagement i.e. the presence of family firms and low board meeting frequency. Based on this, furture research can address the investment efficiency in family firms in presence of outside directors. Secondly, we do not consider the role of family governance contexts due to the lack of data. Indeed, family governance is important as recent literature highlights its impact on innovation strategy (Scholes and Hughes, 2018) and on information asymmetry issues (Suess, 2014) which can pave the way for future research.

Lastly, Labaki and Hirigoyen (2020) consider "divestment" as a crucial strategic decision in family firms and provide a comprehensive model for the divestment decision-making in different family business emotional archetypes. The authors show that both financial and emotional components drive the divestment decision in family businesses. Exploring the "divestment" efficiency by considering the heterogeneity of family business emotional archetypes may then be a promising research avenue.

TABLE 8
Unconditional Relationship between Family Control and Investment

Table 8 shows the results of logit regressions. The dependent variable is based on the level of the unexplained investment. Annual observations in the upper quartile of unexplained investments are classified as over-investment, annual observations in the bottom quartile of unexplained investments are classified as under-investment. Subsequently, "over-invest" corresponds to a dummy variable that takes the value of 1 if the observation of residuals is in the upper quartile, and 0 otherwise. While under-invest is a dummy variable that takes the value of 1 if the observation of residuals is in the bottom quartile, and 0 otherwise. Panel A in table 8 shows the logit regression result for which the dependent variable is "under-invest". Panel B in table 8 shows the logit regression result for which the dependent variable is "over-invest". Family is a dummy variable that takes the value of 1 if the family holds more than 10% of firm's voting rights and 0 otherwise. Fam-Own is the percentage of shares held by the family. Excess is a dummy variable which takes the value of 1 if the ratio of voting rights on cash-flow rights is greater than the average of the sample and 0 otherwise. Fam-CEO is a dummy variable which takes the value of 1 if one family member occupies the position of general manager and 0 otherwise. CFO is the operating cash flow. Leverage is the ratio of debt to the sum of debt and equity. Growth is three years' sales growth rate. Size is the natural logarithm of total assets. The figures in parentheses are the calculated t. *, **, ***: the coefficients are significant at the respective thresholds of 10%, 5%, 1%.

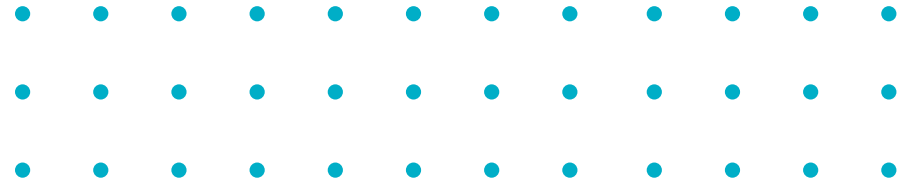| Panel A. Under-investment					
Variables	Family	Fam-Own	Excess	Fam-CEO	Generation
Fam-Var	0.3587	0.0064	0.3640	0.7975	0.2601
	(2.15)**	(2.28)**	(2.12)**	(4.46)***	(1.35)*
CFO	1.5713	0.9294	1.5893	1.5242	1.8264
	(1.77)*	(1.21)	(1.79)*	(1.69)*	(2.08)**
Leverage	0.0483	0.1110	0.0240	0.0472	-0.0396
	(0.15)	(0.38)	(0.08)	(0.15)	(-0.13)
Growth	-0.0053	-0.0000	-0.0055	-0.0055	-0.0046
	(-1.31)	(-0.04)	(-1.32)	(-1.35)	(-1.18)
Size	-0.1971	-0.1372	-0.1971	-0.1735	-0.2148
	(-5.15)***	(-4.04)***	(-5.15)***	(-4.46)***	(-5.32)***
Constant	0.1648	0.6008	0.1534	-0.0769	0.2964
	(0.52)	(2.03)**	(0.48)	(-0.23)*	(0.95)
N	834	834	834	834	834
R2	3.99%	2.25%	3.97%	5.55%	4.02%
Panel B. Over-investment					
Variables	Family	Fam-Own	Excess	Fam-CEO	Generation
Fam-Var	-0.2984	-0.0020	0.0023	-0.7437	-0.1575
	(-1.74)	(-0.64)	(0.19)	(-3.41)***	(-0.88)
CFO	-0.6009	-0.7759	-0.9395	-0.5448	-0.7596
	(-0.70)	(-0.89)	(-1.09)	(-0.65)	(-0.88)
Leverage	0.1920	0.2347	0.2610	0.1946	0.2363
	(0.61)	(0.75)	(0.83)	(0.63)	(0.75)
Growth	-0.0013	-0.0013	-0.0013	-0.0012	-0.0013
	(-0.72)	(-0.72)	(-0.71)	(-0.73)	(-0.72)
Size	0.0527	0.0522	0.0566	0.0336	0.0515
	(1.40)	(1.37)	(1.49)	(0.88)	(1.36)
Constant	-1.4392	-1.5243	-1.6122	-1.2575	-1.5110
	(-4.43)***	(-4.48)***	(-4.86)***	(-3.78)***	(-4.51)***
N	834	834	834	834	834
R2	0.8%	0.54%	0.5%	1.86%	0.58%

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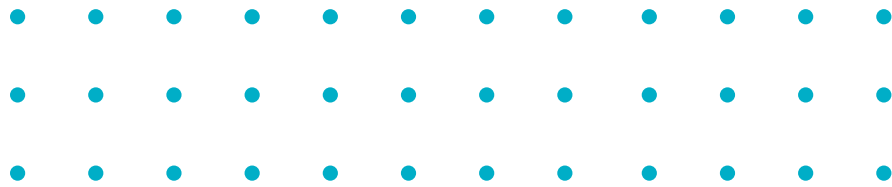Google Scholar   http://dx.doi.org/10.1016/j.jcorpfin.2010.08.004

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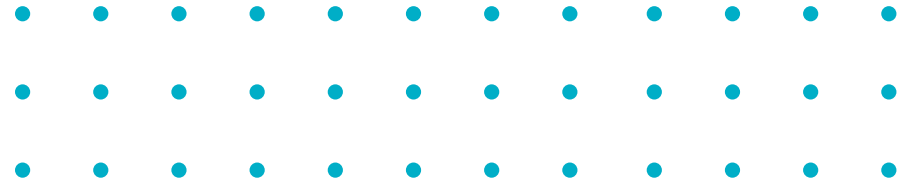
APPENDIX 1
Definition and Variables' measurements

Variable	Definition	Measure
Investment	Investment exepenses	The sum of capital expenditures, R&D, and acquisitions.
Under-invest	Under-investment	is a dummy variable that takes the value of 1 if the estimated residual is in the bottom quartile and 0 otherwise
Over-invest	Overinvestment	is a dummy variable that takes the value of 1 if the estimated residual is in the upper quartile and 0 otherwise
Capex	Capital expenditures	A ratio of capital expenditures to Property, Plant and Equipment (PPE).
MTB	Ratio Market-to-Book	A ratio of marker share value to book value.
Family	Family firm	A dummy variable that takes the value of 1 if the largest shareholder is a family with more than 10% of voting rights, and 0 otherwise (Martinez-Ferrero et al. 2018 and Dahya *et al.* 2008).
Fam-Own	Family ownership	Percentage of shares held by family members.
Excess	Family excess control	A dummy variable that takes the value of 1 if the ratio of voting rights on cash-flow rights is greater than the average of the distribution and 0 otherwise.
Fam-CEO	CEO family member	A dummy variable that takes the value of 1 if the CEO is a family member and 0 otherwise.
Generation	Family generational stage	A dummy variable that takes the value of 1 if the age of family firm is more than 30 years and 0 otherwise (Pindado *et al.* 2015).
Analyst	Number of analysts	The number of analysts following the company (Biddle *et al.* 2009).
CFO	Operating cash flows	A ratio of cash-flows from operations to total assets.
Leverage	Leverage	A ratio of total debts on total assets.
Growth	Sales growth	Three years' sales growth rate.
Size	Firm's size	The natural logarithm of total assets.