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Published in:
Journal of Corporate Finance

DOI:
[10.1016/j.jcorpfin.2016.01.017](https://doi.org/10.1016/j.jcorpfin.2016.01.017)

IMPORTANT NOTE: You are advised to consult the publisher's version (publisher's PDF) if you wish to cite from it. Please check the document version below.

Document Version
Publisher's PDF, also known as Version of record

Publication date:
2016

[Link to publication in University of Groningen/UMCG research database](#)

Citation for published version (APA):
De Cesari, A., Gonenc, H., & Ozkan, N. (2016). The effects of corporate acquisitions on CEO compensation and CEO turnover of family firms. *Journal of Corporate Finance*, 38, 294-317. <https://doi.org/10.1016/j.jcorpfin.2016.01.017>

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The effects of corporate acquisitions on CEO compensation and CEO turnover of family firms



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ARTICLE INFO

Article history:

Received 22 December 2015

Received in revised form 20 January 2016

Accepted 28 January 2016

Available online 2 March 2016

JEL classification:

G30

G34

Keywords:

CEO compensation

CEO turnover

Family firms

Acquisitions

ABSTRACT

This paper investigates the impact of corporate acquisitions on CEO compensation and CEO turnover of family firms in Continental Europe. We find that CEOs in family firms do not experience an increase in their compensation during the post-acquisition period, while there is a positive and statistically significant association between the compensation of CEOs in non-family firms and their acquisition activity. This finding is consistent with the view that controlling family shareholders provide monitoring for CEOs mitigating managerial agency problems that arise from the separation of ownership and control. Further, we find that the likelihood of CEO turnover declines following an acquisition in non-family firms, suggesting that these acquiring CEOs do not face a higher likelihood of dismissal while they receive a higher level of compensation. In contrast, there is no significant impact of acquisitions on CEO turnover in family firms.

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1. Introduction

Family firms have been prevalent across the globe, and a growing literature highlights differences between family and non-family firms in terms of corporate policy decisions (Bennedsen et al., 2010). Empirical evidence shows that family firms differ from non-family firms in various ways including their disclosure, financial structure, and acquisition decisions (Ali et al., 2007; Caprio et al., 2011; Chen et al., 2014). These differences are interpreted as mainly arising from distinctive agency issues related to family firms. On the one hand, firms with concentrated family share ownership can mitigate managerial agency problems arising from the separation of ownership and control (e.g., Jensen and Meckling, 1976). Controlling family shareholders, whose interests are well aligned with the interests of outside investors, are expected to monitor management effectively to reduce potential managerial agency costs. On the other hand, controlling family shareholders can make some corporate decisions that might allow them to extract private benefits of control at the expense of small shareholders (e.g. Bertrand et al., 2002; Johnson et al., 2000). Further, family firms are known to take a long-term management approach in their corporate decision-making (e.g., Gómez-Mejía et al., 2011).¹

In this paper we aim to advance our understanding of corporate acquisition decisions in family firms by examining how corporate acquisitions influence CEO compensation and CEO turnover in family firms. The current literature suggests that corporate acquisitions can be driven by managerial interests, which can come in the forms of enlarged compensation packages and reduced

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¹ Family firms consider their socioemotional wealth, i.e., the utility they derive from noneconomic aspects of the business, including the preservation of the family dynasty and the conservation of the family's social capital, when they make corporate decisions.

risk of CEO turnover following an acquisition (e.g. Jensen, 1986; Shleifer and Vishny, 1989). There has been some evidence from US and UK firms that bidder CEOs receive substantial increases in their compensation during the post-acquisition period, while shareholders can experience a decline in their wealth.² Further, Yim (2013) reports that acquisitions also provide US CEOs with an opportunity to lower their risk of replacement. However, to the best of our knowledge, there is no study that has investigated the impact of acquisition activity on CEO compensation and CEO turnover in family firms. Thus, we aim to fill this gap in the literature.

If controlling family shareholders play a vigilant monitoring role, then we should not observe acquisitions that are mainly driven by CEOs' personal interests rather than the interests of other shareholders. Thus, in family firms, CEOs may not be able to use acquisitions as a way of promoting their self-interest by increasing their compensation and reducing their likelihood of replacement, while shareholders experience a loss in their wealth during the post-acquisition period. However, if controlling family shareholders do not provide monitoring, then CEOs in family firms, in particular professional CEOs, can pursue acquisitions as a way of increasing their compensation packages while also gaining greater job security. Controlling family shareholders would be expected to have the goal of transferring their firms to future generations, suggesting that they might have non-pecuniary benefits from their firms' performance (e.g., Gómez-Mejía et al., 2007). Therefore, we can argue that family shareholders provide monitoring for CEOs in family firms. We would expect families to have the necessary knowledge and incentives for effective monitoring.³ However, CEOs in non-family firms, where agency problems from a separation of ownership and control prevail, can pursue acquisitions for their private benefit in the forms of larger compensation packages and lower risk of replacement, which might not necessarily benefit shareholders.

We focus on the following questions: Is the practice of offering a large compensation following an acquisition common in family firms? To what extent do controlling family shareholders, who are prevalent in Continental European firms, provide monitoring for CEO compensation and CEO turnover decisions during post-acquisition? Do family CEOs and professional CEOs in family firms differ in the way they are rewarded following acquisitions? Despite the recent increase in the acquisition activity in Continental Europe, there has been no empirical evidence regarding how acquisitions influence CEO compensation and CEO turnover in family and non-family firms. Acquisitions provide an ideal setting for investigating the implications of incentives for CEOs in family firms versus non-family firms. Prior studies show that acquisitions mostly destroy shareholder wealth in Europe (Gregory and O'Donohoe, 2014; Martynova and Renneboog, 2011). It is therefore important to explore whether CEOs receive an increase in their compensation or/and gain greater job security during the post-acquisition period and the extent of acquisitions made by CEOs in family and non-family firms to increase CEOs' personal benefits at the expense of other shareholders.

For our empirical analysis, we use a sample of 3219 firm-year observations of 760 Continental European non-financial firms for which CEO compensation data are available from *BoardEx* over the period of 2001–2008. In our empirical analysis, we control for firm-specific and board-specific characteristics that are found to influence CEO compensation in prior studies. We find that acquisitions have a positive and significant effect on the level of CEO total and cash compensation during the post-acquisition period. When we classify our sample of firms into family and non-family firms, we find that CEOs in non-family firms receive an increase in their compensation following an acquisition, while there is no significant relationship between CEO compensation in family firms and their acquisition activity. This finding suggests that CEOs in non-family firms in Continental Europe would be motivated to engage in acquisitions as a way of increasing their compensation. Overall, the increasing trend of acquisitions in Continental Europe can be partly explained by the self-interested pursuits of CEOs in non-family firms. Further, when we classify our sample of family firms into those with family CEOs and those with professional CEOs, our results show that professional CEOs in acquiring family firms receive an increase in total and cash compensation, while family CEOs do not seem to experience an increase in their compensation during the year following an acquisition. Thus, we observe significant differences in the way family firms compensate their family and professional CEOs following an acquisition. Moreover, we show that acquiring CEOs in non-family firms have a lower likelihood of turnover during the post-acquisition period than non-acquiring CEOs. Thus, acquiring CEOs' expanded compensation packages are not offset by a higher risk of termination in non-family firms. We do not observe a similar pattern in family firms, i.e., acquisitions by family firms do not have a significant impact on CEO turnover during the post-acquisition period.

This paper contributes to the literature in several ways. First, it extends the literature on the relationship between CEO compensation and acquisition activity by examining how acquisitions influence CEO compensation in family firms. Specifically, we show that family firms determine their CEO compensation packages following acquisitions differently from non-family firms in ways consistent with agency problems associated with separation of ownership and control. Second, our paper helps us advance our understanding on the extent to which family CEOs could differ from professional CEOs in family firms in terms of their motivations for engaging in acquisitions. We show that acquisitions do not have a significant impact on family CEOs' compensation, controlling for other economic determinants of CEO compensation. In contrast, professional CEOs in family firms receive larger compensation following acquisitions. Third, we provide evidence on how acquisitions can influence CEO turnover during the post-acquisition period in family firms and non-family firms. Specifically, we show that there is a significant reduction in the likelihood of CEO replacement in non-family firms following acquisitions, while acquisitions do not influence the likelihood of CEO replacement in family firms. To our knowledge, this is the first study on how acquisitions influence CEO compensation and CEO turnover in family firms.

² See Bliss and Rosen (2001), Grinstein and Hribar (2004), Harford and Li (2007), and Ozkan (2012).

³ "Four lessons firms can learn from family businesses", Christian Stadler, *Forbes*, April 30, 2015; "The family way", Special Report: Family Companies, *The Economist*, April 18, 2015.

The rest of the paper proceeds as follows. [Section 2](#) provides a review of the extant literature on corporate acquisitions and CEO compensation and turnover, and describes our research questions. [Section 3](#) reports the data characteristics and discusses the empirical methodology. [Section 4](#) documents the sample characteristics, and [Section 5](#) presents the estimation results. [Section 6](#) concludes.

2. Literature review and research questions

2.1. Corporate acquisitions and family firms in Europe

A distinctive characteristic of European firms, in comparison to US firms, is that family control is considerably dominant in Europe ([Croci et al., 2012](#); [Faccio and Lang, 2002](#)). Previous studies show that family firms are less likely to make acquisitions, controlling for all other relevant factors ([Caprio et al., 2011](#); [Shim and Okamuro, 2011](#)). [Caprio et al. \(2011\)](#) find that Continental European family firms are particularly reluctant to make acquisitions when the stake held by the family is not large enough to guarantee control after the transaction. [Shim and Okamuro \(2011\)](#) reach a similar conclusion for 244 mergers of family and non-family firms in Japan. They find that being a family firm decreases the probability of joining in a merger, except in the case that families can maintain their controlling shareholder status following a merger.

The literature also provides evidence on acquirers' performance in family and non-family firms. [Bauguess and Stegemoller \(2008\)](#) find that family firms among S&P 500 firms are associated with a lower announcement return relative to non-family firms. They also find that family firms make relatively poor investment decisions, leading to an average reduction of 0.74% in firm value for each acquisition. In contrast, [Basu et al. \(2009\)](#) examine 103 mergers of newly public US firms and find that acquirers with high levels of family ownership outperform acquirers with low or zero levels of family ownership. [Bouzzgarrou and Navatte \(2013\)](#) find higher acquisition announcement returns for French family acquirers relative to non-family acquirers. Furthermore, [Sraer and Thesmar \(2007\)](#) provide evidence that lower acquisition performance of French family firms belongs to those managed by founders or their heirs. [Caprio et al. \(2011\)](#) find that family control does not influence acquisition performance for their sample of Continental European firms. Their findings show that family firms do not engage in acquisitions that destroy shareholder wealth. [Shim and Okamuro \(2011\)](#) report that non-family firms have better merger performance than family firms for a sample of Japanese firms. [Ben-Amar and Andre \(2006\)](#) use a sample of Canadian firms and find that family firms have higher acquisition performance.

Overall, the extant literature provides mixed evidence on how acquisition performance of family firms differs from that of non-family firms. One possible explanation for this mixed evidence could be that some acquisitions by family firms could be driven by the personal benefits of CEOs at the expense of shareholders' interests. In this paper, we aim to advance our understanding of the acquisition decisions of family firms by investigating whether acquisition activity influences CEO compensation and CEO turnover in family firms in Continental Europe.

2.2. Corporate acquisitions and CEO compensation in family firms

The concentrated ownership structure of family firms and the monitoring of management by families can have potential implications about how acquisitions affect CEO compensation packages. Families as major shareholders could have the power and incentives to monitor CEO decisions. Therefore, CEOs in family firms would not have the discretion to pursue acquisitions in an opportunistic way to expand their personal benefits, i.e., compensation packages, at the other shareholders' expense. Consequently, we would expect the association between CEO compensation and acquisition activity to be stronger in non-family firms than in family firms.

Among family firms there could be differences in CEO decision-making, depending on the CEO type, i.e., family member versus professional (non-family member) CEO. Family CEOs and professional CEOs in family firms can differ in terms of their incentives ([Miller et al., 2013](#)). Agency theory suggests that there is a potential conflict of interest between professional CEOs and shareholders in family firms. Prior studies explore whether the type of CEO, i.e., family CEO vs. professional CEO, could influence firm performance; these studies provide mixed evidence. For instance, [Anderson and Reeb \(2003\)](#) and [Morck et al. \(1988\)](#) document a positive impact of family CEOs on firm performance, while [Barth et al. \(2005\)](#) and [Smith and Amoako-Adu \(1999\)](#) report that family CEOs have a negative impact on firm performance.⁴

Family CEOs could be driven by an altruistic attitude toward future generations and pursue corporate strategies that would guarantee the long-term existence of the firm. Thus, they would be motivated to maximize the shareholder wealth. [Lagarias and Tsoutsoura \(2015\)](#) show that credit spreads are lower for family firms when family CEOs run the firms, suggesting that creditors assess firms with family CEOs as having lower agency costs of debt. Further, [Lin and Hu \(2007\)](#) show that both professional and family CEOs can improve firm performance, as long as strong governance mechanisms exist.

Considering the different incentives family and professional CEOs in family firms might have, we hypothesize that acquisitions are more strongly associated with the compensation of professional CEOs than with that of family CEOs. Unlike professional CEOs, family CEOs whose interests are aligned with those of the controlling family's shareholders might not engage in pursuing an acquisition as a way of expanding their compensation at the expense of the shareholders' interests. However, there could be

⁴ See also [Bertrand \(2009\)](#) for further references on the performance of family CEOs in family firms.

private benefits of control accruing to a controlling family when a member of the family holds the CEO position. As Burkart et al. (2003) argue, a family could expropriate other shareholders if a family member is the CEO. Further, Bloom and Van Reenen (2007) report that family CEOs are less likely to adopt best managerial practices, which can be linked with shareholder wealth maximization. Bandiera et al. (2014) find that family CEOs work fewer hours than professional CEOs in family firms.

2.3. Corporate acquisitions and CEO turnover in family firms

Shleifer and Vishny (1989)'s entrenchment model describes how managers can entrench themselves through acquisitions. They argue that managers have incentives to engage in acquisitions, in particular 'manager-specific' acquisitions, as a way of making themselves valuable to shareholders and costly to replace. For instance, a manager can use the firm's resources to acquire assets whose value is higher under him than under other alternative managers, even when those acquisitions can be value destroying. As a consequence of such entrenching acquisitions, replacing CEOs can be costly. Empirical evidence shows that an acquiring CEO can experience lessened risk of replacement (Yim, 2013). Further Fich et al. (2014) find that CEOs' deal-making activities, such as joint ventures and strategic alliances, reduce the likelihood of CEO replacement. Overall, the current empirical results regarding the impact of deals on CEO replacement support Shleifer and Vishny's entrenchment model of acquisitions. CEOs seem to have incentives to pursue deals in their efforts to maintain their status as CEO and reduce their likelihood of replacement.

In family firms where families' interests are well aligned with those of outside shareholders and families provide monitoring for CEOs, we would not expect CEOs to undertake acquisitions to reduce their likelihood of replacement. The presence of controlling family shareholders might, therefore, not allow CEOs to pursue entrenching acquisitions. In contrast, CEOs in non-family firms can use acquisitions as a way of reducing their likelihood of replacement while rewarding themselves with larger compensation packages following acquisitions.⁵ In this paper, we extend the current literature by investigating CEO retention policies in family firms and non-family firms during the post-acquisition period.

3. Data and empirical methodology

3.1. Data

Following Croci et al. (2012) and Fernandes et al. (2013), we obtain our sample of CEO compensation and CEO turnover data for Continental European non-financial firms over the period 2001–2008 from *BoardEx*. Our sample includes 15 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, and Switzerland. We collect data on acquisitions from the *Thomson Financial SDC Mergers* database. Acquisitions include both domestic and foreign deals by bidders from our sample of European countries. Further, we extract institutional ownership from the ownership module of *Thomson One Banker*, while family ownership data are primarily from the *Amadeus* database. Financial and accounting data are obtained from *Datastream/Worldscope*. When we combine the data from these databases, our final sample consists of an unbalanced panel of 3219 firm-year observations for 760 unique non-financial listed firms.⁶

Following Bennedsen et al. (2015), Franks et al. (2012), and Lins et al. (2013), we classify a firm as a family firm if there is an individual or a group of family members with at least 25% of voting rights. *Amadeus* traces the control chains and calculates voting rights, identifying the ultimate owner who controls the firm directly with at least 25% of the voting rights or through a control chain with all links exceeding the 25% threshold. Thus, as a first step, for our sample firms, we seek to identify whether their ultimate owner is a family member or not. A major difficulty arises if the ultimate owner is a private or listed company. In this case, we try to identify the ultimate owner of these private or listed companies to establish whether or not their ultimate owner is a family member. We supplement the ownership information in *Amadeus* with hand-collected data from annual reports and company websites.⁷ Consequently, 39% of our sample European firms are classified as family firms. Portugal (83%), Italy (69%), France (50%), and Belgium (41%) have the largest percentages of family firms.⁸

Following Harford and Li (2007) and Yim (2013), for our sample of acquisitions, we include only relatively large-size acquisitions in our empirical analysis.⁹ The reason is that it is more likely to capture the impact of acquisitions on CEO compensation and CEO turnover if a deal size is relatively large. We apply filters of 5% and 10% as the relative size requirements for our sample of acquisitions, i.e., the ratio of the deal value to the acquirer's value is at least 5% (10%). We measure the acquirer's value using the

⁵ Anecdotal evidence also shows that family firms tend to stick to the CEOs they appoint, suggesting the presence of 'strategic patience' on the part of controlling family shareholders. Moreover, family firms show their commitment to giving a CEO sufficient time to implement his/her strategies. For instance, see "four lessons firms can learn from family businesses", Christian Stadler, *Forbes*, April 30, 2015.

⁶ A table reporting the distribution of our sample of non-financial firms across different countries is in the appendix.

⁷ Thus, our definition of family firms does not include board representation/officers of family members. However, as Caprio et al. (2011) argue, in Continental European firms, the identity of the largest shareholder with relatively large voting power would be an effective way of identifying who is powerful in corporate decision-making, including CEO hiring and firing decisions.

⁸ Les Hénokiens, which is a club of companies that are at least 200 years old, has remained under the control of one family throughout history and is still run by a family member, has a list of the world's oldest companies, where eight out of fifteen of these world's oldest companies are Italian (*The Economist*, 'The business of survival', 2004).

⁹ Yim (2013) requires the ratio of the deal value to the acquirer's market capitalization to be at least 5%, while Harford and Li (2007) use a filter of 10%, i.e., the ratio of the deal value to the acquirer's market value of assets to be at least 10%.

Table 1

Sample statistics.

This table reports the mean and median values of several deal characteristics, firm characteristics, and the dependent variables used in this study. We apply a filter of 5% and 10% as a relative size requirement for our sample of acquisitions, i.e., the ratio of the deal value to the acquirer's value is at least 5% (10%). The acquirer's value is defined as the market value of total assets at the fiscal year-end prior to the completion date. Variable definitions can be found in Table A2 in Appendix A. We test differences in means (medians) using t-tests (Wilcoxon rank-sum tests). In Panel A, we test whether there are significant differences between family and non-family firms. In Panel B and in Panel C, we compare non-acquiring to acquiring firms.

Panel A: Deal characteristics												
	Family firms			Non-family firms								
	N	Mean	Median	N	Mean	Median						
5% of the relative-size filter for acquisitions												
<i>Deal size</i>	100	619.787	251.981	211	1316.392***	453.800**						
<i>Relative deal size</i>	100	0.170	0.107	211	0.198*	0.141*						
<i>Days to completion</i>	100	96.044	68.531	211	88.075	66.584						
<i>CAR(−1, +1)</i>	97	1.876	1.239	208	2.017	1.353						
<i>CAR(−2, +2)</i>	97	2.369	2.033	208	2.122	1.783						
<i>Domestic deal</i>	100	0.486	0.436	211	0.409	0.000						
<i>Focused deal</i>	100	0.538	0.966	211	0.587	0.977						
<i>Public deal</i>	100	0.389	0.000	211	0.281*	0.000**						
10% of the relative-size filter for acquisitions												
<i>Deal size</i>	54	825.266	362.497	137	1538.552***	617.187*						
<i>Relative deal size</i>	54	0.254	0.204	137	0.268	0.212						
<i>Days to completion</i>	54	89.045	72.479	137	91.156	72.145						
<i>CAR(−1, +1)</i>	53	2.042	1.493	136	2.219	1.389						
<i>CAR(−2, +2)</i>	53	3.065	3.042	136	2.487	2.197						
<i>Domestic deal</i>	54	0.519	0.619	137	0.410	0.000						
<i>Focused deal</i>	54	0.593	1.000	137	0.606	0.989						
<i>Public deal</i>	54	0.341	0.000	137	0.344	0.000						
Panel B: Firm characteristics (5% of the relative-size filter for acquisitions)												
	All sample (N = 3219)				Family firms (N = 1247)				Non-family firms (N = 1972)			
	Non-acquiring firms (N = 2053)		Acquiring firms (N = 1166)		Non-acquiring firms (N = 870)		Acquiring firms (N = 377)		Non-acquiring firms (N = 1183)		Acquiring firms (N = 789)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>Family firm</i>	0.424	0.000	0.323**	0.000***								
<i>Family CEO</i>	0.204	0.000	0.120***	0.000***	0.480	0.000	0.371***	0.000***				
<i>Institutional ownership</i>	0.172	0.138	0.212***	0.188***	0.128	0.106	0.148***	0.130***	0.205	0.184	0.243***	0.214***
<i>Board size</i>	11.230	10.000	11.433	11.000***	10.353	10.000	10.631	10.000	11.875	11	11.816	11*
<i>Board busyness</i>	0.319	0.000	0.473***	0.000***	0.321	0.000	0.459***	0.000***	0.318	0.000	0.479***	0.000***
<i>Board independence</i>	0.212	0.182	0.268***	0.235***	0.181	0.143	0.222***	0.200***	0.234	0.2	0.29***	0.25***
<i>CEO age</i>	53.146	53.000	53.529	53.000	53.617	53.000	52.745	52.000**	52.8	53	53.904***	54***
<i>Dual shares</i>	0.254	0.000	0.254	0.000	0.294	0.000	0.321	0.000	0.224	0.000	0.222	0.000
<i>Sales</i>	5457.0	993.6	6657.8***	1444.7***	4543.0	857.8	2846.8***	880.4	6129.2	1123.5	8478.7***	1956.1***
<i>Market-to-book</i>	1.790	1.420	1.597***	1.386**	1.788	1.425	1.650***	1.453	1.792	1.417	1.571***	1.35***
<i>Industry-adjusted return on assets</i>	0.007	0.005	−0.002**	0.000**	0.017	0.010	0.012	0.010	−0.001	0.000	−0.009*	−0.004*
<i>Market-adjusted return</i>	0.070	0.011	0.069	0.013	0.081	0.018	0.056	0.005	0.062	0.007	0.076	0.025
<i>Return standard deviation</i>	2.144	1.892	2.133	1.867	2.037	1.839	2.041	1.798	2.223	1.946	2.177	1.91

Panel C: CEO total, cash compensation, and turnover (5% of the relative-size filter for acquisitions)

All sample (N = 3219)				
Non-acquiring firms (N = 2053)			Acquiring firms (N = 1166)	
	Mean	Median	Mean	Median
Total compensation	1308.902	670.186	1688.983***	840.269***
Cash compensation	915.906	588.989	1029.451***	694.705***
CEO turnover	0.267	0	0.26	0
Family firms (N = 1247)				
Non-acquiring firms (N = 870)			Acquiring firms (N = 377)	
	Mean	Median	Mean	Median
Total compensation	1305.198	578.738	1267.330	663.662
Cash compensation	918.096	530.066	865.847	569.107
CEO turnover	0.238	0	0.281	0
Non-family firms (N = 1972)				
Non-acquiring firms (N = 1183)			Acquiring firms (N = 789)	
	Mean	Median	Mean	Median
Total compensation	1311.627	746.553	1890.457***	945.435***
Cash compensation	914.295	628.733	1107.625***	760.624***
CEO turnover	0.288	0	0.25*	0*
Family CEO (N = 558)				
Non-acquiring firms (N = 418)			Acquiring firms (N = 140)	
	Mean	Median	Mean	Median
Total compensation	1067.066	414.777	1031.876	426.619
Cash compensation	802.363	401.642	760.316	365.908
CEO turnover	0.143	0	0.186	0
Professional CEO (N = 689)				
Non-acquiring firms (N = 452)			Acquiring firms (N = 237)	
	Mean	Median	Mean	Median
Total compensation	1525.416	773.756	1406.418	778.639
Cash compensation	1025.122	650.693	928.186	684.834
CEO turnover	0.325	0	0.337	0

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

market value of the total assets at the fiscal year-end prior to the completion date. Our sample firms completed 872 acquisitions over the period 2000–2007, as identified from the SDC database. When we use the 5% (10%) filter, the total number of acquisitions is reduced to 311 (191).¹⁰

3.2. Empirical methodology

3.2.1. Does acquisition activity influence CEO compensation in family firms?

In our empirical analysis, we use two measures of CEO compensation: total CEO compensation (*Total compensation*) and CEO cash-based compensation (*Cash compensation*), which is the sum of the bonus and base salary during the year. *Total compensation* is the sum of cash-based and equity-based compensation, which is equal to the sum of the Black–Scholes value of stock options granted and the market value of restricted stocks granted during the year. Both compensation measures are expressed in thousands of Euros and are extracted from *BoardEx*. In order to test the impact of acquisitions on CEO compensation, we follow Harford and Li (2007) and Ozkan (2012) and use the following regression model:

$$CEO\ pay_{it} = \alpha + \beta_1 Dummy\ acquisition_{it-1} + \delta Controls_{it-1} + \varepsilon_{it} \quad (1)$$

where *CEO pay* is the natural logarithm of either *Total compensation* or *Cash compensation*. *Dummy acquisition* is a dummy variable that takes the value of one for a firm-year following an acquisition, and zero otherwise. *Controls* include variables that are reported to influence CEO compensation by previous researchers. A positive and significant coefficient on *Dummy acquisition* would indicate that CEO compensation is larger following an acquisition. Model (1) allows us to test whether CEO compensation during the post-acquisition period reaches levels that cannot be explained by the values of its standard determinants.

In our regression analysis, we control for lagged values of the following firm-specific financial variables: the natural logarithm of net sales in thousands of Euros as a firm-size proxy (*Sales (log)*), the ratio of the market value of assets to book value (*Market-to-book*), the return on assets minus the industry average of return on assets (*Industry-adjusted return on assets*), the market-adjusted stock performance based on the local market index (*Market-adjusted return*), and the standard deviation of the percentage daily return over a one-year period (*Return standard deviation*).

Further, we include *Family firm*, which is a dummy variable for family firms, and governance variables including institutional ownership, a dummy variable for dual shares, and board characteristics. Recently there has been an increase in the share ownership of Continental European companies by institutional investors (Aggarwal et al., 2011). Thus, we control for the potential monitoring role of institutional investors. *Institutional ownership* is the percentage of shareholdings by financial institutions, which include banks and trusts, insurance companies, investment advisors, pension funds, research firms, and sovereign wealth funds. *Dual shares* is a dummy variable that takes the value of one when the company has a dual-class share structure, and zero otherwise. This variable captures the monitoring ability of controlling shareholders. Those controlling shareholders with dual-class shares may be entrenched because of a lower percentage of cash flow rights relative to control rights. We also control for board characteristics, i.e., board size, proportion of independent board members, and board busyness, which are reported to influence the level of CEO compensation (Crocì et al., 2012). *Board size* is the total number of executive and non-executive directors on a board; *Board busyness* is a dummy variable that equals one if a board has 50% or more of its directors holding three or more directorships in other public companies; and *Board independence* is the proportion of independent non-executive directors. We use *CEO age* as a proxy for the experience of CEOs. We also control for country, industry (using the Fama–French 49-industry classification), and year dummies.

Next, we attempt to augment our Eq. (1) with dummy variables that specify acquiring family and non-family firms, and non-acquiring family and non-family firms. We classify our sample of firm-year observations into sub-groups based on whether or not they belong to the family firm group, and whether or not they engage in acquisitions.¹¹ On the basis of this classification, we create dummy variables specifying each sub-group of the firm-year observations. We use these dummy variables in our regression model to investigate whether family firms differ from non-family firms in the way they compensate their CEOs during the post-acquisition period. In particular, we examine whether, after controlling for a large set of firm-specific and governance variables, CEO compensation in family and non-family firms increases during the post-acquisition period.

Our dummy variables for the sub-groups of firm-year observations are as follows: *Acquisition–Family* is a dummy variable equal to one for family firms following acquisitions, and zero otherwise; *Acquisition–Non-family* is a dummy variable equal to one for non-family firms following acquisitions, and zero otherwise; *Non-acquisition–Family* is a dummy variable equal to one for family firms without acquisition activity, and zero otherwise; finally, *Non-acquisition–Non-family* is a dummy variable equal to one for non-family firms and without acquisition activity, and zero otherwise. In order to test whether CEOs in family firms receive an increase in their compensation during the post-acquisition period, we estimate the following regression model:

$$CEO\ Pay_{it} = \alpha + \beta_1 Acquisition-Family_{it-1} + \beta_2 Acquisition-Non-family_{it-1} + \beta_3 Non-acquisition-Family_{it-1} + \delta Controls_{it-1} + \varepsilon_{it} \quad (2)$$

¹⁰ If there are multiple deals by an acquirer in a given year during our sample period, we consider the sum of those deals and apply our 5% (10%) filter accordingly.

¹¹ See Table A1 in Appendix A for our classification of firms.

The set of *Controls* is the same as that in [model \(1\)](#) with the exception of *Family firm* that is dropped from the set. The coefficient estimates of the three dummy variables, *Acquisition–Family*, *Acquisition–Non-family*, and *Non-acquisition–Family*, indicate the differences in CEO compensation for the three sub-groups of our sample relative to CEO compensation in non-family firms that are not involved in acquisitions (base group). A positive and statistically significant coefficient on β_2 would indicate that in non-family firms, CEO compensation is larger in the years following acquisitions than in other years. A similar conclusion can be drawn for family firms if the difference between β_1 and β_3 is positive and statistically significant. We perform a Wald test to compare these two coefficient estimates.

Next, we classify family firms based on the identity of the CEO, distinguishing between family and professional CEOs in family firms. Family CEOs could be less entrenched and consider a long horizon in their decision-making, while professional CEOs in family firms could act in a way that maximizes their interests in the absence of effective family monitoring. We investigate whether the impact of acquisitions on CEO compensation varies, depending on the identity of CEOs in family firms, i.e., family CEOs and professional CEOs in family firms. Thus, we estimate the following regression model, including dummy variables, for family CEOs and professional CEOs in family firms:

$$\begin{aligned} \text{CEO pay}_{it} = & \alpha + \beta_1 \text{Acquisition–Family CEO}_{it-1} + \beta_2 \text{Acquisition–Professional CEO}_{it-1} + \\ & \beta_3 \text{Non–acquisition–Family CEO}_{it-1} + \beta_4 \text{Non–acquisition–Professional CEO}_{it-1} \\ & + \beta_5 \text{Acquisition–Non–family}_{it-1} + \delta \text{Controls}_{it-1} + \varepsilon_{it} \end{aligned} \quad (3)$$

where *Acquisition–Family CEO* (*Acquisition–Professional CEO*) is a dummy variable equal to one for family firms with family (professional) CEOs in the years following acquisitions, and zero otherwise. In contrast, *Non-acquisition–Family CEO* (*Non-acquisition–Professional CEO*) is a dummy variable equal to one for family firms with family (professional) CEOs and no acquisition activity, and zero otherwise. *Acquisition–Non-family* is a dummy variable that has already been defined above. In this model, our base group contains observations of non-family firms that are not involved in acquisitions. Thus, the coefficient estimates for *Acquisition–Family CEO*, *Acquisition–Professional CEO*, *Non-acquisition–Family CEO*, and *Non-acquisition–Professional CEO* can be interpreted as CEO pay differentials relative to CEOs in the base group. We are interested in testing whether the differences in β_1 – β_3 and β_2 – β_4 are positive and statistically significant. To this end, we again perform a Wald test.

To estimate Eqs. (1), (2), and (3), we use pooled OLS with robust standard errors clustered at the firm level. We also include country, industry, and year dummies to control for country-specific, industry-specific, and year-specific fixed effects. Country dummies capture, for example, the differences in Continental European countries in terms of one-tiered or two-tiered board structures and other country-specific governance characteristics.

3.2.2. Does acquisition activity influence CEO turnover in family firms?

Acquisition activity can influence CEO compensation, as well as the likelihood of CEO turnover ([Fich et al., 2014](#); [Yim, 2013](#)). CEOs can undertake acquisitions to gain personal benefits, i.e., a larger compensation package and a lower risk of dismissal, at shareholders' expense ([Jensen, 1986](#); [Shleifer and Vishny, 1989](#)). In this paper, we examine how acquisition activity can influence CEO compensation, as well as CEO turnover risk, in family and non-family firms. If a controlling family shareholder provides monitoring for CEO compensation and CEO replacement decisions, CEOs cannot employ acquisition activity to enhance their personal benefits at shareholders' expense. In contrast, CEOs in non-family firms can engage in acquisitions and thereby negotiate for larger compensation and lessen their risk of replacement following acquisitions. We examine the impact of acquisition activity on CEO turnover using the following logit regression model:

$$\text{CEO turnover}_{it} = \alpha + \beta_1 \text{Dummy acquisition}_{it-1} + \delta \text{Controls}_{it-1} + \varepsilon_{it}. \quad (4)$$

CEO turnover is a binary variable that takes the value of one if the CEO leaves his/her firm during the year, and zero otherwise.¹² *Controls* include firm-specific and governance variables, which are the same as those in Eqs. (1) to (3) and are reported to be determinants of CEO turnover risk by previous researchers (e.g. [Fich et al., 2014](#); [Weisbach, 1988](#)). In the next step, we also include dummies for sub-groups of family and non-family firms, with and without acquisition activity, and we report our results in [Section 5](#).

4. Sample characteristics

Panel A of [Table 1](#) presents the deal characteristics for our sample of acquisitions with the 5% and 10% relative-size filters.¹³ Mean and median values of the deal size, relative deal size, number of days to complete and CARs (cumulative abnormal returns), proportion of domestic deals, focused deals, and public deals are reported for family and non-family firms. We rely on *t*-tests and

¹² Since we aim to study whether CEO replacements are less common in post-acquisition periods, we set the variable *CEO turnover* to one if the CEO has been in place for less than two calendar years. In post-acquisition years, a CEO's tenure of two years or longer implies that the firm is certainly led by the same CEO, both before and after the acquisition activity. If an acquisition takes place in year *t*, and we have the same CEO, both at the end of year *t* – 1 and at the end of year *t* + 1, then there is no turnover around the acquisition, and the tenure of the CEO (time-in-role in *BoardEx*) is at least two years. To be consistent, we build the variable *CEO turnover* in the same way in periods, both with and without acquisition activity.

¹³ In our sample of acquisitions, there are firms that are involved in multiple acquisitions. If a firm is involved in multiple acquisition activities in a year, we cumulate the values of the acquisitions to compute *Deal size* and *Relative deal size* and rely on the value-weighted averages of the other variables in this panel.

Wilcoxon rank-sum tests to determine whether there are statistically significant differences between these two sub-samples of firms. We observe that *Deal size* is significantly smaller for our sample of family firms than that of non-family firms. This finding is consistent with Caprio et al. (2011). For their sample of 777 European firms for the period 1998–2008, the mean acquisition size is € 465.91 million for family firms, while it is € 879.87 million for non-family firms. Further, *Relative deal size*, which is the ratio of the deal size to the bidder's market value of assets, is significantly smaller for family firms than for non-family firms for our sample of acquisitions with the 5% relative-size filter. Family firms seem to acquire relatively smaller size targets than those of non-family acquirers. Kachaner et al. (2012)'s survey results also show that family firms acquire fewer and smaller targets, since they are concerned about integration risk and change in the culture and fabric of the corporation. Moreover, for our sample of deals with the 5% relative-size filter, we observe that on average, family (non-family) firms complete acquisitions in 96 (88) days, while the median completion period is approximately 68 (66) days for family (non-family) firms. The average (median) completion period is considerably similar when the 10% filter is applied. Differences in *Days to completion* are not statistically significant.

Next, we test whether there are significant differences in acquisition performance between family and non-family bidders. Following the literature, we measure acquisition performance by market-model adjusted abnormal returns around announcement dates. Thus, we calculate 5-day and 3-day cumulative abnormal returns (CARs) using the event window $(-2, +2)$ and $(-1, +1)$, respectively. For our sample of acquisitions with a 5% relative-size filter, in Panel A of Table 1, we observe that the mean (median) CAR $(-1, +1)$ is 1.88% (1.24%) for family firms, while it is 2.02% (1.35%) for non-family firms. Moreover, we find that the mean and median values of CAR $(-2, +2)$ are positive for both family and non-family firms. Notably, in both 3-day and 5-day event windows, there is no statistically significant difference in the average (median) CARs between family firms and non-family firms. Similarly, for our sample of acquisitions with a 10% relative-size filter, we do not observe any statistically significant difference in the mean and median CARs between family and non-family firms. These findings are consistent with Caprio et al. (2011), who show that family control does not influence acquisition performance measured by CARs around the announcement of the acquisition for their sample of European firms.

We observe that family firms are more likely to be involved in domestic deals than non-family firms, but the differences between the two types of firms are not statistically significant. In our sample of acquisitions with a 5% relative size, on average, 54% of family and 59% of non-family acquisitions involve targets in the same Fama–French 49-industry classification. We also observe that the values for the variable *Focused deal* are not statistically different between the two sub-samples of family and non-family firms. Finally, we find that family firms are more likely to target public firms, but this finding is statistically significant only when we consider the 5% filter.¹⁴

In Panel B of Table 1, we consider our sample of acquisitions with the 5% relative-size filter and report the descriptive statistics of the firm-specific characteristics for our full sample, and sub-samples of family and non-family firms, which are then classified as acquiring and non-acquiring firms.¹⁵ We define 'acquiring firms' as those that are involved in an acquisition at least once, while non-acquiring firms do not undertake any acquisitions during the sample period 2000–2007.¹⁶ We observe that on average, 32.3% of acquiring firms and 42.4% of non-acquiring firms are family firms, indicating that family firms are less likely to be engaged in acquisitions than non-family firms. Among family firms, 48% of non-acquiring firms and 37.1% of acquiring firms have a family CEO. Thus, a family CEO is more common in non-acquiring family firms than in acquiring family firms.

We note that average (median) *Institutional ownership* is significantly larger in acquiring than in non-acquiring firms, for both family and non-family firms. Recently anecdotal evidence has shown that institutional investors have been pioneers in shareholder activism in family firms in Europe. Our findings suggest that institutional investors can act as facilitators in the market for corporate control, for both family and non-family firms in continental European firms.¹⁷ Croci et al. (2012) argue that institutional investors could provide monitoring for determining CEO compensation, but they might reduce their monitoring if they observe that a family's interests are in alignment with the interests of minority shareholders, and that controlling family shareholders monitor CEO compensation effectively.

On average *Board busyness* and *Board independence* are significantly larger for acquiring firms than for non-acquiring firms. In fact, both acquiring family and non-family firms have more independent and busier directors than non-acquiring family and non-family firms. Notably, these findings suggest that independent and busy directors can act as facilitators for acquisition activity in both family and non-family firms.

We observe that in our sample of family and non-family firms, the median *Sales* is larger for acquiring firms than non-acquiring firms. We find that in family firms, the median *Market-to-book* is larger for acquiring firms than non-acquiring firms. In contrast, in non-family firms, the median *Market-to-book* is smaller for acquiring firms than non-acquiring firms. In both family and non-family firms, there is no statistically significant difference in the median *Market-adjusted return* between acquiring and

¹⁴ We also checked whether there are differences between our sample of family and non-family firms in terms of engaging in serial acquisitions. We define serial acquisitions as two or more successive acquisitions by the same firm within the same year. This definition is similar to that of Aktas et al. (2011), who define serial acquisitions as two successive acquisitions in a 12-month period. We observe that the percentage of serial acquisitions made by family (non-family) firms is 35 (51) for our sample of acquisitions with a 10% relative-size filter. We find similar values when we consider our sample of acquisitions with a 5% relative-size filter.

¹⁵ For space considerations, we do not tabulate the descriptive statistics for our sample of acquisitions with a 10% relative size threshold, but they are available in Appendix A.

¹⁶ As mentioned previously, our sample period for our full sample of firms is 2001–2008, but we consider acquisitions that are completed during the period 2000–2007, since we examine how acquisitions influence CEO compensation during the post-acquisition year.

¹⁷ Ferreira et al. (2010) provide evidence of foreign institutional investors playing an important role of governance and facilitating cross-border acquisitions.

non-acquiring firms. Further, we do not observe any statistically significant difference in the *Return standard deviation* between acquiring and non-acquiring firms.

In Panel C of Table 1, we present the descriptive statistics for the level of CEO total and cash compensation, and CEO turnover for acquiring and non-acquiring firms. We observe that both acquiring and non-acquiring firms rely more on cash compensation than equity-based compensation. Both in the full sample and in the sub-sample of non-family firms, we observe that both CEO cash and total compensation are higher in acquiring firms than in non-acquiring firms. Further, there is no statistically significant difference between acquiring and non-acquiring family firms in terms of CEO compensation. In contrast, we find that CEO compensation is statistically significantly higher in acquiring non-family firms than non-acquiring non-family firms.

We note that there is a statistically significant difference in average CEO turnover between acquiring non-family and non-acquiring non-family firms. In contrast, average CEO turnover in acquiring family firms is not statistically significantly different from CEO turnover in non-acquiring family firms. Further, we observe that average CEO turnover for family CEOs in acquiring (non-acquiring) family firms is 18.6% (14.3%), while it is 32.5% (33.7%) for professional CEOs in acquiring (non-acquiring) family firms. This finding is consistent with Volpin (2002), showing that top executive turnover is lower for those executives belonging to the family of the controlling shareholder than for other executives. Further, Kachaner et al. (2012) find that on average, family firms have a relatively lower turnover of workforce than non-family firms, thus creating a culture of commitment.

5. Estimation results

5.1. CEO compensation and acquisitions

In this section, we test whether acquisitions can influence the level of CEO total and cash compensation for our sample of Continental European firms. Table 2 reports our estimation results for our whole sample, including both family and non-family firms. We observe that the coefficient estimate for *Dummy acquisition* is positive and statistically significant for the regressions of the level of total and cash compensation. Thus, the CEOs of acquiring firms have higher levels of total and cash compensation

Table 2

CEO compensation and acquisitions.

This table reports the estimates of the OLS regressions for the natural logarithm of CEO total compensation and the natural logarithm of CEO cash compensation. All regressions include country, industry, and year fixed effects. The ownership and financial variables are lagged with respect to the dependent variable. Variable definitions can be found in Table A2 in Appendix A. Robust standard errors clustered at the firm level are in brackets.

	Total compensation (log)		Cash compensation (log)	
<i>Dummy acquisition</i> (5%)	0.139** (0.0610)		0.0932* (0.0562)	
<i>Dummy acquisition</i> (10%)		0.230*** (0.0749)		0.196*** (0.0672)
<i>Family firm</i>	-0.132* (0.0688)	-0.131* (0.0688)	-0.0977 (0.0638)	-0.0967 (0.0637)
<i>Institutional ownership</i>	0.727*** (0.201)	0.721*** (0.200)	0.642*** (0.185)	0.633*** (0.185)
<i>Board size</i>	0.0417*** (0.00954)	0.0413*** (0.00956)	0.0366*** (0.00898)	0.0361*** (0.00899)
<i>Board busyness</i>	0.288*** (0.0646)	0.289*** (0.0645)	0.148** (0.0593)	0.147** (0.0593)
<i>Board independence</i>	0.466*** (0.170)	0.472*** (0.170)	0.274* (0.158)	0.279* (0.158)
<i>CEO age</i>	-0.00620 (0.00413)	-0.00612 (0.00413)	-0.00174 (0.00383)	-0.00167 (0.00382)
<i>Dual shares</i>	0.148** (0.0724)	0.147** (0.0723)	0.119* (0.0653)	0.119* (0.0652)
<i>Sales</i> (log)	0.268*** (0.0282)	0.269*** (0.0282)	0.233*** (0.0263)	0.234*** (0.0263)
<i>Market-to-book</i>	0.146*** (0.0294)	0.147*** (0.0294)	0.0968*** (0.0259)	0.0985*** (0.0258)
<i>Industry-adjusted return on assets</i>	-0.369 (0.261)	-0.357 (0.261)	-0.119 (0.244)	-0.110 (0.244)
<i>Market-adjusted return</i>	0.0136 (0.0433)	0.00662 (0.0429)	0.0355 (0.0398)	0.0285 (0.0394)
<i>Return standard deviation</i>	0.0137 (0.0278)	0.0126 (0.0277)	0.0127 (0.0260)	0.0114 (0.0259)
<i>Constant</i>	2.259*** (0.450)	2.243*** (0.450)	2.327*** (0.416)	2.303*** (0.415)
Observations	3219	3219	3219	3219
R-squared	0.461	0.462	0.438	0.439

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

following an acquisition than any other years when there is no acquisition, and also than firms that are not involved in an acquisition during the sample period. This finding is consistent with prior findings in the literature (Harford and Li, 2007; Ozkan, 2012).

We use filters for both 5% and 10% as the threshold of the relative size of deals and observe that acquisitions have a positive and significant effect on CEO total compensation and cash compensation, regardless of which filter we use. We also interact stock return, as a measure of firm performance, with the acquisition dummy to test whether CEO pay-performance sensitivity changes during the post-acquisition period. In untabulated findings, we observe that there is no significant variation in pay-performance sensitivity following an acquisition. Thus, CEOs can engage in acquisitions and expand their compensation packages without making their pay more sensitive to changes in firm performance.

We find that the CEOs in family firms have significantly lower levels of total compensation. CEO cash compensation is not significantly different between family and non-family firms. Our results show that market-adjusted stock returns and the riskiness of stock returns have no significant impact on CEO compensation. Similarly, we observe that the accounting-based measure of firm performance is not statistically significantly related to CEO compensation. We find that firm size, measured by the log of sales, the market-to-book ratio, and total institutional ownership has a positive and significant impact on the level of CEO compensation. The finding for institutional ownership suggests that an increase in the ownership of institutional investors in Continental European firms leads to a higher level of CEO cash and total compensation. Consistent with previous studies (Amoako-Adu et al., 2011; Masulis et al., 2009), we find that the presence of dual-class shares has a positive and significant impact on CEO compensation, indicating that firms with a dual-class equity structure pay more to their CEOs. We also observe that CEO compensation increases with board size and the percentage of busy board members. This finding supports the argument that larger boards can have problems with coordination, communication, and monitoring of the management, which can lead to a higher level of CEO compensation. The coefficient estimate for the ratio of independent directors is also positive and significant. Independent board members do not seem to be effective in providing monitoring for CEO compensation packages in Continental Europe. Furthermore, the coefficient estimate for CEO age is not statistically significant. To summarize, our results in Table 2 show that controlling for relevant firm-specific characteristics and CEO age, there is an increase in CEO compensation following acquisitions in our sample of Continental European firms. This finding supports the notion of empire-building incentives of CEOs, i.e., CEOs can be motivated to undertake acquisitions with the purpose of rewarding themselves with larger compensation.

5.2. CEO compensation, acquisitions, and the role of family control

Next, we specify four different sub-samples: acquiring family firms (*Acquisition-Family*), acquiring non-family firms (*Acquisition-Non-family*), non-acquiring family firms (*Non-acquisition-Family*), and non-acquiring non-family firms. Table 3 presents the estimation results of Eq. (2) including p-values for the Wald tests to analyze statistical differences between the coefficient estimates for *Acquisition-Family* and *Non-acquisition-Family*. The results for *Acquisition-Non-family* show that in the year after acquisitions, the CEOs of non-family firms have a significantly large total and cash compensation than in other years. In contrast, the larger p-values of the Wald tests imply that the estimated coefficients on *Acquisition-Family* and *Non-acquisition-Family* are not significantly different. These results indicate that CEO compensation is higher for acquiring non-family firms than non-acquiring non-family firms.¹⁸ On the other hand, controlling family shareholders seem to provide monitoring for CEO compensation and prevent significant increases in compensation during the post-acquisition period.

5.3. CEO compensation, acquisitions, and the role of family CEO

Table 4 reports the estimation results of our Eq. (3) and compares CEO compensation of family and professional CEOs in family firms in the post-acquisition period.¹⁹ The p-values of the Wald tests indicate that the compensation levels of family CEOs in acquiring family firms (*Acquisition-Family CEO*) are not statistically significantly different from those of family CEOs in non-acquiring family firms (*Non-acquisition-Family CEO*). In contrast, at the 10% relative deal size threshold, the coefficient on *Acquisition-Professional CEO* is significantly larger than that on *Non-acquisition-Professional CEO*. These results indicate that, unlike family CEOs, professional CEOs may be able to exploit acquisitions to increase their compensation in the post-acquisition period. This finding is consistent with the survey results of Mullins and Schoar (2015), who report that professional CEOs of family firms seem very similar to CEOs of non-family firms in terms of their business philosophies and management strategies.

¹⁸ We also run regressions controlling for the anti-director index from Spamann (2010). One could argue that in countries with weaker shareholder protection, the impact of controlling family shareholders could be stronger. However, in our untabulated results, we do not observe any significant impact of investor protection on the relationship between CEO compensation and acquisition activity.

¹⁹ Additionally, we test whether 'founder family' specification can make a difference. In our sample of family firms, 27% of them are classified as 'founder family' firms, where the founding family is still the controlling shareholder. It may be important to run this robustness check, since founding families may be more attached to the firm they created and have more reputational concerns. Moreover, our main definition of family firm implies that one or more individuals acting in concert are a family. We repeat our regression analysis using the 'founder family' classification and find that our results remain the same. For space considerations, we do not tabulate these results.

Table 3

CEO compensation and acquisitions in family and non-family firms.

This table reports the estimates of the OLS regressions for the natural logarithm of CEO total compensation and CEO cash compensation for our whole sample of family and non-family firms. All regressions include country, industry, and year fixed effects. The ownership and financial variables are lagged with respect to the dependent variable. Variable definitions can be found in Table A2 in Appendix A. Robust standard errors clustered at the firm level are in brackets.

	Total compensation (log)		Cash compensation (log)	
<i>Acquisition (5%)–Family (B1)</i>	−0.0704 (0.124)		−0.105 (0.111)	
<i>Acquisition (10%)–Family (B1)</i>		0.0726 (0.143)		0.0689 (0.123)
<i>Acquisition (5%)–Non-family (B2)</i>	0.185*** (0.0707)		0.151** (0.0659)	
<i>Acquisition (10%)–Non-family (B2)</i>		0.242*** (0.0904)		0.210** (0.0817)
<i>Non-acquisition (5%)–Family (B3)</i>	−0.119* (0.0698)		−0.0817 (0.0646)	
<i>Non-acquisition (10%)–Family (B3)</i>		−0.128* (0.0692)		−0.0942 (0.0641)
<i>Institutional ownership</i>	0.727*** (0.201)	0.721*** (0.200)	0.642*** (0.185)	0.633*** (0.185)
<i>Board size</i>	0.0416*** (0.00956)	0.0413*** (0.00957)	0.0365*** (0.00901)	0.0361*** (0.00900)
<i>Board busyness</i>	0.289*** (0.0646)	0.289*** (0.0646)	0.149** (0.0594)	0.147** (0.0593)
<i>Board independence</i>	0.469*** (0.169)	0.473*** (0.169)	0.277* (0.158)	0.280* (0.158)
<i>CEO age</i>	−0.00623 (0.00413)	−0.00612 (0.00413)	−0.00178 (0.00382)	−0.00167 (0.00382)
<i>Dual shares</i>	0.148** (0.0724)	0.147** (0.0723)	0.119* (0.0654)	0.119* (0.0652)
<i>Sales (log)</i>	0.269*** (0.0282)	0.269*** (0.0282)	0.233*** (0.0263)	0.234*** (0.0263)
<i>Market-to-book</i>	0.146*** (0.0294)	0.147*** (0.0294)	0.0966*** (0.0259)	0.0984*** (0.0258)
<i>Industry-adjusted return on assets</i>	−0.366 (0.261)	−0.357 (0.261)	−0.116 (0.245)	−0.110 (0.245)
<i>Market-adjusted return</i>	0.0135 (0.0433)	0.00686 (0.0430)	0.0354 (0.0397)	0.0288 (0.0394)
<i>Return standard deviation</i>	0.0130 (0.0278)	0.0125 (0.0277)	0.0118 (0.0260)	0.0113 (0.0258)
<i>Constant</i>	2.246*** (0.450)	2.240*** (0.451)	2.310*** (0.416)	2.300*** (0.416)
Observations	3219	3219	3219	3219
R-squared	0.462	0.462	0.439	0.439
p-value B1 = B3	0.657	0.114	0.811	0.131

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

5.4. CEO turnover and acquisitions in family and non-family firms

In this section, we investigate whether the likelihood of CEO turnover increases during the post-acquisition period. We observe that CEOs in non-family firms receive an increase in their compensation following acquisitions, but this increase in compensation can involve a trade-off, i.e., an increase in the risk of CEO turnover for acquiring firms. Thus, CEOs facing this trade-off might not be fully motivated to pursue acquisitions in an opportunistic way, since their larger compensation package comes at the expense of a higher risk of termination.

We run logit regressions with a CEO turnover dummy as a dependent variable, which is equal to one if the CEO leaves office in the current year, and zero otherwise. In Table 5, we find that the coefficient on *Dummy acquisition* is negative and significant. This result indicates that CEOs engaging in acquisitions are less likely to be replaced than non-acquiring CEOs. We also interact the acquisition dummy with firm performance as proxied by stock returns to see whether poorly performing firms are more likely to fire their CEOs during the post-acquisition period. In untabulated analyses, we find that firm performance does not influence the relationship between CEO turnover risk and acquisition activity, i.e., acquiring CEOs reduce their risk of being replaced, regardless of their performance.

Next we include dummies for family and non-family firms to test whether there is a difference between family and non-family firms in terms of CEO replacement following an acquisition. In Table 6, we observe that the coefficient for *Acquisition–Non-family* is negative and statistically significant, regardless of which filter we use (that is, 5% or 10%). Our results suggest that CEOs in non-family firms can reduce their likelihood of replacement by engaging in an acquisition. For family firms, we do not find any

Table 4

CEO compensation, acquisitions, and CEO type.

This table reports the estimates of the OLS regressions for the natural logarithm of CEO total compensation and CEO cash compensation for our whole sample of family and non-family firms. All regressions include country, industry, and year fixed effects. The ownership and financial variables are lagged with respect to the dependent variable. Variable definitions can be found in Table A2 in Appendix A. Robust standard errors clustered at the firm level are in brackets.

	Total compensation (log)		Cash compensation (log)	
	−0.288 (0.211)		−0.315* (0.189)	
Acquisition (5%)–Family CEO (B1)		−0.191 (0.201)		−0.151 (0.193)
Acquisition (10%)–Family CEO (B1)	0.0515 (0.136)		0.0154 (0.122)	
Acquisition (5%)–Professional CEO (B2)		0.226 (0.181)		0.199 (0.148)
Acquisition (10%)–Professional CEO (B2)	−0.169 (0.115)		−0.0848 (0.106)	
Non-acquisition (5%)–Family CEO (B3)		−0.182 (0.114)		−0.104 (0.105)
Non-acquisition (10%)–Family CEO (B3)	−0.0867 (0.0766)		−0.0807 (0.0710)	
Non-acquisition (5%)–Professional CEO (B4)		−0.0943 (0.0753)		−0.0894 (0.0697)
Non-acquisition (10%)–Professional CEO (B4)	0.185*** (0.0706)		0.151** (0.0658)	
Acquisition (5%)–Non-family		0.242*** (0.0902)		0.210** (0.0816)
Acquisition (10%)–Non-family	0.726*** (0.201)	0.721*** (0.201)	0.639*** (0.185)	0.632*** (0.185)
Institutional ownership	0.0407*** (0.00981)	0.0404*** (0.00981)	0.0364*** (0.00922)	0.0359*** (0.00922)
Board size	0.284*** (0.0650)	0.283** (0.0651)	0.147** (0.0597)	0.145** (0.0598)
Board busyness	0.463*** (0.170)	0.464*** (0.170)	0.276* (0.158)	0.276* (0.158)
Board independence	−0.00604 (0.00420)	−0.00587 (0.00420)	−0.00172 (0.00387)	−0.00156 (0.00387)
CEO age	0.143* (0.0735)	0.142* (0.0732)	0.118* (0.0664)	0.117* (0.0662)
Dual shares	0.268*** (0.0283)	0.268*** (0.0283)	0.234*** (0.0263)	0.234*** (0.0262)
Sales (log)	0.144*** (0.0294)	0.145*** (0.0294)	0.0960*** (0.0260)	0.0980*** (0.0259)
Market-to-book	−0.352 (0.262)	−0.340 (0.262)	−0.112 (0.245)	−0.103 (0.245)
Industry-adjusted return on assets	0.0161 (0.0432)	0.00981 (0.0430)	0.0371 (0.0396)	0.0306 (0.0394)
Market-adjusted return	0.0125 (0.0277)	0.0119 (0.0276)	0.0123 (0.0259)	0.0115 (0.0257)
Return standard deviation	2.274*** (0.444)	2.271*** (0.446)	2.306*** (0.408)	2.302*** (0.409)
Constant				
Observations	3219	3219	3219	3219
R-squared	0.462	0.463	0.439	0.440
p-value B1 = B3	0.546	0.964	0.186	0.786
p-value B2 = B4	0.269	0.0540	0.391	0.0304

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

significant relation between the risk of CEO turnover and acquisition activity. For both the 5% and 10% filters, the Wald tests show that differences between the coefficient estimates for *Acquisition–Family* and *Non-acquisition–Family* are statistically insignificant. Thus, CEOs in family firms do not seem to be able to engage in acquisitions as a way of reducing their risk of termination, while CEOs in non-family firms can pursue acquisitions for entrenchment purposes, i.e., to reduce their risk of dismissal due to poor performance. One explanation for this finding of insignificant impact of acquisition activity on the likelihood of CEO turnover in family firms could be that family firms have a longer horizon in their decision-making and do not consider short-term corporate outcomes in their CEO turnover decisions. [Kachaner et al. \(2012\)](#) report that family firms extol the benefits of longer employee tenure, which can help with efficient team dynamics and a collective mindset. Their survey results also show that family firms focus on creating a culture of commitment and purpose.

Table 5

CEO turnover and acquisitions.

This table reports the estimates of the logit regressions for CEO turnover. All regressions include country, industry, and year fixed effects. The ownership and financial variables are lagged with respect to the dependent variable. Variable definitions can be found in Table A2 in Appendix A. Robust standard errors clustered at the firm level are in parentheses. Marginal effects, which are computed at the means of the covariates, are in square brackets. For binary variables, marginal effects are computed as discrete differences from the base level.

	CEO turnover	CEO turnover
	−0.330**	
	(0.149)	
Dummy acquisition (5%)	[−0.056]	−0.398**
		(0.189)
Dummy acquisition (10%)		[−0.066]
	−0.0236	−0.0238
	(0.131)	(0.131)
Family firm	[−0.004]	[−0.004]
	−0.198	−0.200
	(0.469)	(0.468)
Institutional ownership	[−0.036]	[−0.036]
	0.0169	0.0174
	(0.0157)	(0.0156)
Board size	[0.003]	[0.003]
	−0.0812	−0.0851
	(0.126)	(0.126)
Board busyness	[−0.015]	[−0.015]
	−0.0694	−0.0757
	(0.293)	(0.293)
Board independence	[−0.013]	[−0.014]
	−0.0498***	−0.0499***
	(0.00792)	(0.00790)
CEO age	[−0.009]	[−0.009]
	−0.0930	−0.0885
	(0.138)	(0.138)
Dual shares	[−0.017]	[−0.016]
	0.137***	0.136***
	(0.0456)	(0.0456)
Sales (log)	[0.025]	[0.025]
	−0.00582	−0.00454
	(0.0683)	(0.0681)
Market-to-book	[−0.001]	[−0.001]
	−2.482***	−2.504***
	(0.618)	(0.616)
Industry-adjusted return on assets	[−0.453]	[−0.457]
	−0.276*	−0.270*
	(0.122)	(0.122)
Market-adjusted return	[−0.05]	[−0.049]
	0.131*	0.131*
	(0.0682)	(0.0683)
Return standard deviation	[0.024]	[0.024]
	−15.35***	−15.35***
Constant	(1.282)	(1.295)
Observations	3219	3219

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

In Table 7, we test whether there are differences between family and professional CEOs in family firms in terms of their likelihood of replacement following an acquisition. The Wald test results show that there is no statistically significant difference between acquiring family CEOs and non-acquiring family CEOs in terms of their risk of replacement during the post-acquisition period. Similarly, we do not find a statistically significant difference between acquiring professional CEOs and non-acquiring professional CEOs in family firms in terms of their risk of replacement following an acquisition.

5.5. Matching estimation

There is a possibility that our results of the impact of acquisitions on CEO compensation and CEO turnover for our sample of Continental European firms could be driven by a potential endogeneity problem. Our sample of acquiring firms could differ from non-acquiring firms in a systematic manner. Moreover, acquiring firms can self-select themselves, based on their characteristics. Thus, some underlying variables could explain both the increase in CEO compensation (or decrease in the likelihood of CEO

Table 6

CEO turnover and acquisitions in family and non-family firms.

This table reports the estimates of the logit regressions for the CEO turnover in our entire sample of family and non-family firms. All regressions include country, industry, and year fixed effects. The ownership and financial variables are lagged with respect to the dependent variable. Variable definitions can be found in Table A2 in Appendix A. Robust standard errors clustered at the firm level are in parentheses. Marginal effects, which are computed at the means of the covariates, are in square brackets. For binary variables, marginal effects are computed as discrete differences from the base level.

	CEO turnover	CEO turnover
Acquisition (5%)–Family (B1)	–0.185 (0.256) [–0.032]	
Acquisition (10%)–Family (B1)		–0.0949 (0.323) [–0.017]
Acquisition (5%)–Non-family (B2)	–0.426** (0.190) [–0.07]	
Acquisition (10%)–Non-family (B2)		–0.549** (0.236) [–0.087]
Non-acquisition (5%)–Family (B3)	–0.0476 (0.133) [–0.009]	
Non-acquisition (10%)–Family (B3)		–0.0480 (0.132) [–0.009]
Institutional ownership	–0.196 (0.469) [–0.036]	–0.196 (0.468) [–0.036]
Board size	0.0171 (0.0157) [0.003]	0.0176 (0.0156) [0.003]
Board busyness	–0.0836 (0.126) [–0.015]	–0.0882 (0.125) [–0.016]
Board independence	–0.0750 (0.293) [–0.014]	–0.0831 (0.293) [–0.015]
CEO age	–0.0497*** (0.00790) [–0.009]	–0.0499*** (0.00789) [–0.009]
Dual shares	–0.0930 (0.138) [–0.017]	–0.0904 (0.138) [–0.016]
Sales (log)	0.137*** (0.0456) [0.025]	0.136*** (0.0455) [0.025]
Market-to-book	–0.00559 (0.0682) [–0.001]	–0.00335 (0.0681) [–0.001]
Industry-adjusted return on assets	–2.488*** (0.616) [–0.454]	–2.505*** (0.614) [–0.457]
Market-adjusted return	–0.277** (0.122) [–0.05]	–0.274** (0.122) [–0.05]
Return standard deviation	0.132* (0.0683) [0.024]	0.132* (0.0684) [0.024]
Constant	–15.33*** (1.282)	–15.32*** (1.253)
Observations	3219	3219
p-value B1 = B3	0.565	0.880

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

replacement) and firms' acquisition activity. Consequently, the presence of these confounding variables could lead us to mistakenly attribute the changes in CEO compensation and likelihood of CEO turnover to firms' acquisition activity. Even though in our multivariate models we control for a large set of observable determinants of CEO compensation and turnover, there is no guarantee that acquiring and non-acquiring firms share a common support. In order to mitigate this endogeneity concern and biases due to

Table 7

CEO turnover, acquisitions, and CEO type.

This table reports the estimates of the logit regressions for the CEO turnover in our entire sample of family and non-family firms. All regressions include country, industry, and year fixed effects. The ownership and financial variables are lagged with respect to the dependent variable. Variable definitions can be found in Table A2 in Appendix A. Robust standard errors clustered at the firm level are in parentheses. Marginal effects, which are computed at the means of the covariates, are in square brackets. For binary variables, marginal effects are computed as discrete differences from the base level.

	CEO turnover	CEO turnover
Acquisition (5%)–Family CEO (B1)	–0.678 (0.428) [–0.101]	
Acquisition (10%)–Family CEO (B1)		–1.308* (0.716) [–0.16]
Acquisition (5%)–Professional CEO (B2)	0.0221 (0.316) [0.004]	
Acquisition (10%)–Professional CEO (B2)		0.370 (0.387) [0.073]
Non-acquisition (5%)–Family CEO (B3)	–0.761*** (0.208) [–0.119]	
Non-acquisition (10%)–Family CEO (B3)		–0.726*** (0.206) [–0.114]
Non-acquisition (5%)–Professional CEO (B4)	0.338** (0.136) [0.064]	
Non-acquisition (10%)–Professional CEO (B4)		0.316** (0.134) [0.06]
Acquisition (5%)–Non-family	–0.428** (0.189) [–0.069]	
Acquisition (10%)–Non-family		–0.547** (0.235) [–0.085]
Institutional ownership	–0.134 (0.471) [–0.024]	–0.141 (0.469) [–0.025]
Board size	0.00741 (0.0155) [0.001]	0.00833 (0.0154) [0.001]
Board busyness	–0.135 (0.125) [–0.024]	–0.143 (0.125) [–0.026]
Board independence	–0.127 (0.293) [–0.023]	–0.138 (0.294) [–0.025]
CEO age	–0.0495*** (0.00806) [–0.009]	–0.0495*** (0.00804) [–0.009]
Dual shares	–0.156 (0.138) [–0.028]	–0.151 (0.138) [–0.027]
Sales (log)	0.128*** (0.0443) [0.023]	0.128*** (0.0441) [0.023]
Market-to-book	–0.0275 (0.0681) [–0.005]	–0.0246 (0.0679) [–0.004]
Industry-adjusted return on assets	–2.401*** (0.618) [–0.432]	–2.415*** (0.615) [–0.435]
Market-adjusted return	–0.265** (0.121) [–0.048]	–0.258** (0.121) [–0.046]
Return standard deviation	0.122* (0.0683) [0.022]	0.125* (0.0685) [0.022]

(continued on next page)

Table 7 (continued)

	CEO turnover	CEO turnover
Constant	− 13.83*** (1.287)	− 13.87*** (1.282)
Observations	3219	3219
p-value $B1 = B3$	0.842	0.410
p-value $B2 = B4$	0.295	0.886

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

selection on observables, we use the bias-corrected nearest-neighbor matching estimator and the coarsened exact matching (CEM) estimator. Overall, our findings from the matching estimation methods support the results from pooled OLS estimation.

5.5.1. Bias-corrected nearest-neighbor matching estimator

In order to estimate the average treatment effects (ATEs) of the acquisitions on the outcome variables (CEO compensation and CEO turnover), we use the bias-corrected nearest-neighbor matching estimator developed by Abadie and Imbens (2011). If there are some observable confounders that affect both the treatment and outcome variables, a matching estimator can reduce biases in the ATE estimates (Abadie and Imbens, 2011). By using these confounders in matching, we can obtain more reliable estimates of the ATEs. As matching variables, we use all of our control variables in regression models, except for the dummy for family firms and year, country, and industry dummies. Table 8 reports the estimates of the treatment effects of an acquisition on CEO compensation and CEO turnover for the two sub-samples of family and non-family firms. In our matching, we use one, three, and five matches and find that our results are consistent. We observe statistically significant ATEs in the sub-samples of non-family firms, implying that an acquisition leads to significant increases in CEO compensation and reductions in CEO turnover. For family firms, the ATEs are often statistically insignificant. Even when significant findings can be reported for family firms, the p-values of the ATEs are quite large, compared with those for non-family firms. Overall, our matching estimation results support our regression results from Table 2 to Table 7.

5.5.2. Coarsened exact matching estimator

Next, we test the robustness of our findings by using a coarsened exact matching estimation method.²⁰ The key characteristic of CEM is that it belongs to a class of matching methods called Monotonic Imbalance Bounding (MIB), which bounds the maximum imbalance between the treated and control groups, i.e., the distributions of the covariates in the groups are more similar (Iacus et al., 2011). Further, Iacus et al. (2012) show that CEM bounds both the error in estimating the average treatment effect and the amount of model dependence. CEM is applied by creating strata based on the cut-off points of matching variables. Observations from strata that do not contain both treated and control observations are dropped from the sample in order to ensure that treated and control observations share a common support. In order to mitigate the reduction in sample size, we only consider the following continuous control variables from our multivariate models that are also found to be significant determinants of the likelihood of an acquisition in our sample: *Institutional ownership*, *Board busyness*, *Sales (log)*, *Market-to-book*, and *Market-adjusted return*. Quartiles of these variables are used to create the strata and select the sub-samples of better matched firm-years. When relying on the 5% (10%) relative size filter, we have 302 (188) treated and 1448 (1111) control firm-years. In Table 9, we re-estimate our main regression models using the sub-sample, based on the 5% filter, and report results that are consistent with those in previous sections of the paper. The findings are qualitatively similar if we instead consider the smaller sub-sample for the 10% filter.

6. Conclusion

There is an extensive literature that highlights the differences in family and non-family firms in terms of performance, disclosure, financial structure, and governance. To a large extent, these differences are explained by the presence of different types of agency problems in family and non-family firms. In this paper, we put forward a hypothesis regarding how corporate acquisitions influence CEO compensation and CEO turnover in family and non-family firms. We argue that in an environment where controlling family shareholders provide monitoring, CEOs cannot pursue acquisitions as a way of gaining greater job security and expanding their compensation packages, regardless of potential shareholder wealth loss. However, in non-family firms, where agency problems arising from the separation of ownership and control are prevalent, CEOs can pursue acquisitions in an opportunistic manner, thereby enhancing their self-interest at the expense of shareholders.

We empirically investigate the impact of corporate acquisitions on CEO compensation and CEO turnover in bidder family and non-family firms in Continental Europe. For our empirical analysis, we use a dataset of 3219 firm-year observations over the period 2001–2008. We provide, to our knowledge, the first empirical evidence on the impact of acquisitions on CEO compensation and CEO turnover in family versus non-family firms. We find that acquisitions have a positive and significant effect on the level of CEO cash and total compensation in our sample of Continental European firms.

²⁰ Feldman et al. (2014) also employ a coarsened exact matching model to investigate the impact of divestitures on the firm value of family firms, considering the non-random selection of divestitures.

Table 8

ATEs (Average Treatment Effects) of acquisitions using covariate matching.

This table reports the estimates of average treatments effects (ATEs) that are computed by using the bias-corrected nearest-neighbor matching estimator developed by Abadie and Imbens (2011). An observation is assumed to be treated when the *Dummy acquisition* is equal to one. We apply filters of 5% and 10% as the relative size requirements for our sample of acquisitions, i.e., the ratio of the deal value to the acquirer's value is at least 5% (10%). We measure the acquirer's value using the market value of total assets at the fiscal year-end prior to the completion date. The outcome variables are CEO total compensation, CEO cash compensation, and CEO turnover. The matching variables are all of the control variables in the regression models, except for the dummy for family firms and year, country, and industry dummies. The ATEs are reported for one, two, and three matches. Variable definitions can be found in Table A2 in Appendix A.

Panel A: Family firms				
1 match				
5% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	−0.005	0.146	−0.040	0.967
<i>Cash compensation (log)</i>	−0.049	0.128	−0.383	0.701
<i>CEO turnover</i>	−0.041	0.051	−0.804	0.421
10% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.377	0.218	1.727	0.084
<i>Cash compensation (log)</i>	0.310	0.197	1.575	0.115
<i>CEO turnover</i>	−0.118	0.061	−1.919	0.054
3 matches				
5% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.009	0.136	0.067	0.946
<i>Cash compensation (log)</i>	−0.041	0.118	−0.347	0.728
<i>CEO turnover</i>	−0.052	0.046	−1.118	0.263
10% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.388	0.210	1.842	0.065
<i>Cash compensation (log)</i>	0.275	0.188	1.465	0.142
<i>CEO turnover</i>	−0.118	0.064	−1.843	0.065
5 matches				
5% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.002	0.132	0.015	0.987
<i>Cash compensation (log)</i>	−0.056	0.115	−0.488	0.625
<i>CEO turnover</i>	−0.051	0.044	−1.150	0.250
10% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.385	0.209	1.836	0.066
<i>Cash compensation (log)</i>	0.273	0.186	1.465	0.142
<i>CEO turnover</i>	−0.121	0.066	−1.821	0.068
Panel B: Non-family firms				
1 match				
5% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.136	0.076	1.790	0.073
<i>Cash compensation (log)</i>	0.110	0.062	1.757	0.078
<i>CEO turnover</i>	−0.085	0.030	−2.767	0.005
10% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.219	0.094	2.314	0.020
<i>Cash compensation (log)</i>	0.209	0.072	2.879	0.003
<i>CEO turnover</i>	−0.085	0.041	−2.093	0.036
3 matches				
5% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.145	0.074	1.961	0.049
<i>Cash compensation (log)</i>	0.116	0.061	1.905	0.056
<i>CEO turnover</i>	−0.095	0.028	−3.390	0.000
10% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
<i>Total compensation (log)</i>	0.238	0.092	2.577	0.009
<i>Cash compensation (log)</i>	0.218	0.069	3.144	0.001
<i>CEO turnover</i>	−0.090	0.039	−2.298	0.021

(continued on next page)

Table 8 (continued)

Panel B: Non-family firms				
5 matches				
5% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
Total compensation (log)	0.156	0.072	2.157	0.030
Cash compensation (log)	0.123	0.060	2.048	0.040
CEO turnover	−0.091	0.028	−3.223	0.001
10% relative-size filter	Coefficient	Standard error	z-Stat	p-Value
Total compensation (log)	0.235	0.092	2.556	0.010
Cash compensation (log)	0.209	0.067	3.088	0.002
CEO turnover	−0.083	0.039	−2.107	0.035

When we classify our sample of firms into family and non-family firms, we find that acquisitions lead to a higher level of CEO total and cash compensation in non-family firms, while we do not observe any significant impact of acquisitions on the level of CEO compensation in family firms. Further, professional CEOs in family firms experience an increase in their compensation during post-acquisition, while acquisitions do not have a significant impact on the compensation of family CEOs in family firms. This finding suggests that controlling family shareholders do not provide monitoring for professional CEOs in family firms engaging in acquisitions as an opportunistic way of expanding their compensation packages. Thus, professional CEOs in family firms would have the motivation to make acquisitions, given that they can experience an increase in their compensation during the post-acquisition period. Moreover, our results show that acquisitions do not have a significant impact on CEO turnover in family

Table 9

CEM (Coarsened Exact Matching) estimation.

This table reports the estimates of the coarsened exact matching (CEM) regressions for CEO total compensation, CEO cash compensation, and CEO turnover. CEM estimation relies on strata that are based on quartiles of the following variables: *Institutional ownership*, *Board busyness*, *Sales (log)*, *Market-to-book*, and *Market-adjusted return*. A reduced sample of 1750 better-matched firm years is used in the regressions. All regressions include country, industry, and year fixed effects. The ownership and financial variables are lagged with respect to the dependent variable. Variable definitions can be found in Table A2 in Appendix A. Standard errors are in parentheses.

	Total compensation (log)	Cash compensation (log)	CEO turnover
Acquisition (5%)–Family (B1)	−0.136 (0.101)	−0.117 (0.0922)	−0.134 (0.280)
Acquisition (5%)–Non-family (B2)	0.172** (0.0718)	0.165** (0.0653)	−0.484** (0.207)
Non-acquisition (5%)–Family (B3)	−0.130** (0.0588)	−0.0673 (0.0534)	−0.233 (0.164)
Institutional ownership	0.534*** (0.185)	0.471*** (0.168)	−0.410 (0.505)
Board size	0.0566*** (0.00680)	0.0454*** (0.00618)	0.0434** (0.0181)
Board busyness	0.324*** (0.0515)	0.178*** (0.0468)	−0.260* (0.145)
Board independence	0.493*** (0.119)	0.383*** (0.108)	0.645** (0.329)
CEO age	−0.00533* (0.00311)	−0.000571 (0.00282)	−0.0472*** (0.00894)
Dual shares	0.286*** (0.0594)	0.198*** (0.0540)	−0.135 (0.165)
Sales (log)	0.237*** (0.0194)	0.210*** (0.0176)	0.132** (0.0540)
Market-to-book	0.175*** (0.0387)	0.120*** (0.0352)	0.143 (0.107)
Industry-adjusted return on assets	−0.0391 (0.326)	0.202 (0.296)	−3.308*** (0.864)
Market-adjusted return	0.147** (0.0606)	0.110** (0.0551)	−0.119 (0.170)
Return standard deviation	0.00851 (0.0334)	0.0226 (0.0304)	−0.0727 (0.0913)
Constant	2.862*** (0.640)	2.472*** (0.582)	−15.55 (424.6)
Observations	1750	1750	1750
R-squared	0.542	0.500	
p-value B1 = B3	0.954	0.591	0.725

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

firms, while CEOs in non-family firms seem to reduce their likelihood of replacement during the post-acquisition period. Finally, our findings help advance our knowledge and understanding of how family and non-family firms differ in terms of CEO compensation and CEO replacement policies during the post-acquisition period.

Acknowledgments

We would like to thank Jeffrey Netter (the Editor), an anonymous reviewer, Christopher Baum, Roel Brouwers, Espen Eckbo, Ettore Croci, Eliezer Fich, Marc Goergen, Kai Li, Svetlana Mira, Karin Thorburn, Grzegorz Trojanowski, Ahn Tran, Hannes Wagner, Frank Windmeijer and the participants of FMA Europe 2014, Maastricht, EFMA 2015, Amsterdam, annual meetings, and the 16th CGI Workshop 2015, Manchester, for their valuable feedback.

Appendix A

Table A1

Classification of firm-year observations.

	Family firm		Non-family firm
Acquisition	<i>Acquisition–Family</i>	<i>Acquisition–Family CEO</i> <i>Acquisition–Professional CEO</i>	<i>Acquisition–Non-family</i>
Non-acquisition	<i>Non-acquisition–Family</i>	<i>Non-acquisition–Family CEO</i> <i>Non-acquisition–Professional CEO</i>	<i>Non-acquisition–Non-family</i>

Table A2

Variable definitions.

This table reports definitions for the dependent variables, acquisition, family, and CEO dummies, and other variables used in the study.

Panel A: Dependent variables	
Variable	Definition
<i>Total compensation</i>	CEO total compensation, which is the sum of cash compensation and equity-based compensation, in thousands of Euros. Equity-based compensation is equal to the value of shares and options granted during a year. For the value of options, <i>BoardEx</i> provides the estimated value of options awarded, which is a theoretical value used to calculate the potential value of the option during the vesting period by using the Black–Scholes model. For the value of restricted stock, <i>BoardEx</i> reports the maximum value obtainable under the long-term incentive plan.
<i>Cash compensation</i>	CEO cash compensation, which is the sum of salary and bonuses in thousands of Euros.
<i>CEO turnover</i>	Binary variable that takes the value of one if the CEO leaves his/her firm during the year.
Panel B: Acquisition, family, and CEO dummies	
Variable	Definition
<i>Dummy acquisition (5%)</i>	Binary variable that is equal to one for the year following an acquisition, with <i>Relative deal size</i> of at least 5%. In the case of multiple deals in the same year, we cumulate the values of the deals.
<i>Dummy acquisition (10%)</i>	Binary variable that is equal to one for the year following an acquisition, with <i>Relative deal size</i> of at least 10%. In the case of multiple deals in the same year, we cumulate the values of the deals.
<i>Family firm</i>	Binary variable that equals one when the firm is controlled by a family.
<i>Family CEO</i>	Binary variable that takes the value of one when a family member is the CEO in a family firm, and zero when the CEO is not a family member in a family firm. The variable is set to missing when <i>Family firm</i> equals zero. That is, this variable is not defined when the firm is not a family firm.
<i>Acquisition (5%)–Family</i>	Binary variable that is equal to one when both <i>Dummy acquisition (5%)</i> and <i>Family firm</i> take the value of one.
<i>Acquisition (10%)–Family</i>	Binary variable that is equal to one when both <i>Dummy acquisition (10%)</i> and <i>Family firm</i> take the value of one.
<i>Acquisition (5%)–Family CEO</i>	Binary variable that is equal to one when both <i>Dummy acquisition (5%)</i> and <i>Family CEO</i> take the value of one.
<i>Acquisition (10%)–Family CEO</i>	Binary variable that is equal to one when both <i>Dummy acquisition (10%)</i> and <i>Family CEO</i> take the value of one.
<i>Acquisition (5%)–Professional CEO</i>	Binary variable that is equal to one when <i>Dummy acquisition (5%)</i> takes the value of one and <i>Family CEO</i> takes the value of zero.
<i>Acquisition (10%)–Professional CEO</i>	Binary variable that is equal to one when <i>Dummy acquisition (10%)</i> takes the value of one and <i>Family CEO</i> takes the value of zero.
<i>Non-acquisition (5%)–Family</i>	Binary variable that is equal to one when <i>Dummy acquisition (5%)</i> takes the value of zero and <i>Family firm</i> takes the value of one.
<i>Non-acquisition (10%)–Family</i>	Binary variable that is equal to one when <i>Dummy acquisition (10%)</i> takes the value of zero and <i>Family firm</i> takes the value of one.
<i>Non-acquisition (5%)–Family CEO</i>	Binary variable that is equal to one when <i>Dummy acquisition (5%)</i> takes the value of zero and <i>Family CEO</i> takes the value of one.
<i>Non-acquisition (10%)–Family CEO</i>	Binary variable that is equal to one when <i>Dummy acquisition (10%)</i> takes the value of zero and <i>Family CEO</i> takes the value of one.
<i>Non-acquisition (5%)–Professional CEO</i>	Binary variable that is equal to one when both <i>Dummy acquisition (5%)</i> and <i>Family CEO</i> take the value of zero.
<i>Non-acquisition (10%)–Professional CEO</i>	Binary variable that is equal to one when both <i>Dummy acquisition (10%)</i> and <i>Family CEO</i> take the value of zero.
<i>Acquisition (5%)–Non-family</i>	Binary variable that is equal to one when <i>Dummy acquisition (5%)</i> takes the value of one and <i>Family firm</i> takes the value of zero.
<i>Acquisition (10%)–Non-family</i>	Binary variable that is equal to one when <i>Dummy acquisition (10%)</i> takes the value of one and <i>Family firm</i> takes the value of zero.

(continued on next page)

Table A2 (continued)

Panel C: Other variables	
Variable	Definition
<i>Board busyness</i>	A dummy variable that equals one if the board is defined as busy, which occurs when 50% or more of the board's outside directors hold three or more directorships in other quoted companies.
<i>Board independence</i>	The ratio of independent non-executive directors to <i>Board size</i> .
<i>Board size</i>	<i>Board size</i> is the total number of executive and non-executive directors.
<i>CAR(−1, +1)</i>	Cumulative abnormal return for the deal announcement date calculated by using the market model over the event window (−1, +1). In the case of multiple deals in the same year, we use a value-weighted average.
<i>CAR(−2, +2)</i>	Cumulative abnormal return for the deal announcement date calculated by using the market model over the event window (−2, +2). In the case of multiple deals in the same year, we use a value-weighted average.
<i>CEO age</i>	The age of the CEO.
<i>Days to completion</i>	Total number of days between announcement and deal completion dates. In the case of multiple deals in the same year, we use a value-weighted average.
<i>Deal size</i>	The value of the deal in millions of Euros. In the case of multiple deals in the same year, we cumulate the values of the deals.
<i>Domestic deal</i>	A dummy that equals one if the bidder and target are from the same country. In the case of multiple deals in the same year, we use a value-weighted average.
<i>Dual shares</i>	A binary variable that takes the value of one if the firm has a dual-class equity structure.
<i>Focused deal</i>	A dummy that is set to one if the bidder and target are from the same industry. In the case of multiple deals in the same year, we use a value-weighted average.
<i>Industry-adjusted return on assets</i>	The industry-adjusted ratio of earnings before interest and taxes to total assets.
<i>Institutional ownership</i>	Total percentage of shares held by financial institutions.
<i>Market-adjusted return</i>	The annual stock return adjusted by the local market return.
<i>Market-to-book</i>	The ratio of the market value of assets to the book value of assets.
<i>Public deal</i>	A dummy that equals one if the target is a listed firm. In the case of multiple deals in the same year, we use a value-weighted average.
<i>Relative deal size</i>	The ratio of <i>Deal size</i> to the market value of assets of the bidder. In the case of multiple deals in the same year, we cumulate the values of the deals.
<i>Return standard deviation</i>	The annual standard deviation of daily stock returns.
<i>Sales</i>	Net sales in millions of Euros.
<i>Sales (log)</i>	Natural logarithm of net sales in thousands of Euros.

Table A3

Sample distribution across Continental European countries.

Country	Number of firm-years	Number of unique firms
Austria	19	4
Belgium	129	43
Denmark	21	5
Finland	38	10
France	1119	224
Germany	384	111
Greece	8	4
Italy	279	68
Netherlands	427	83
Norway	82	29
Portugal	12	5
Spain	97	27
Sweden	499	107
Switzerland	104	39
Luxembourg	1	1
Total	3219	760

Table A4

Firm characteristics (10% of relative-size filter for acquisitions).

This table reports the mean and median values of firm characteristics. We apply a filter of 10% as a relative size requirement for our sample of acquisitions, i.e., the ratio of the deal value to the acquirer's value is at least 10%. The acquirer's value is measured by the market value of total assets at the fiscal year-end prior to the completion date. Variable definitions can be found in Table A1 in Appendix A. We test differences in the means (medians) between non-acquiring and acquiring firms using t-tests (Wilcoxon rank-sum tests).

	All sample (N = 3219)				Family firms (N = 1247)				Non-family firms (N = 1972)			
	Non-acquiring firms (N = 2413)		Acquiring firms (N = 806)		Non-acquiring firms (N = 1106)		Acquiring firms (N = 231)		Non-acquiring firms (N = 1397)		Acquiring firms (N = 575)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
<i>Family firm</i>	0.421	0.000	0.287***	0.000***								
<i>Family CEO</i>	0.187	0.000	0.132***	0.000***	0.445	0.000	0.459	0.000				
<i>Institutional ownership</i>	0.176	0.142	0.220***	0.197***	0.131	0.108	0.151***	0.136***	0.208	0.187	0.247***	0.219***
<i>Board size</i>	11.206	10.000	11.596**	11.000***	10.433	10.000	10.455	10.000	11.768	11.000	12.054	12.000***
<i>Board busyness</i>	0.343	0.000	0.469***	0.000***	0.347	0.000	0.429**	0.000**	0.340	0.000	0.485***	0.000***
<i>Board independence</i>	0.218	0.182	0.275***	0.250***	0.182	0.154	0.245***	0.250***	0.244	0.214	0.286***	0.250***
<i>CEO age</i>	53.303	53.000	53.231	53.000	53.593	53.000	52.303**	51.000***	53.092	53.000	53.603	54.000*
<i>Dual shares</i>	0.246	0.000	0.278*	0.000*	0.297	0.000	0.325	0.000	0.208	0.000	0.259**	0.000**
<i>Sales</i>	5444.9	1015.2	7230.2***	1546.7***	4494.1	9084.4	1990.0***	763.8**	6136.5	1138.7	9335.4***	2375.5***
<i>Market-to-book</i>	1.788	1.438	1.516***	1.337***	1.790	1.452	1.553***	1.422	1.787	1.436	1.501***	1.300***
<i>Industry-adjusted return on assets</i>	0.008	0.007	-0.010***	-0.006***	0.018	0.011	0.005**	0.005	0.001	0.004	-0.017***	-0.010***
<i>Market-adjusted return</i>	0.064	0.008	0.088	0.018	0.070	0.008	0.091	0.021	0.060	0.008	0.086	0.016
<i>Return standard deviation</i>	2.151	1.891	2.108	1.855	2.031	1.832	2.074	1.807	2.239	1.962	2.121**	1.880**

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

Table A5

CEO total, cash compensation, and turnover (10% of the relative-size filter for acquisitions).

This table reports the mean and median values of the dependent variables. We apply a filter of 10% as a relative size requirement for our sample of acquisitions, i.e., the ratio of the deal value to the acquirer's value is at least 10%. We measure the acquirer's value using the market value of total assets at the fiscal year-end prior to the completion date. Variable definitions can be found in Table A1 in Appendix A. We test the differences in means (medians) between non-acquiring and acquiring firms using t-tests (Wilcoxon rank-sum tests).

	All sample (N = 3219)			
	Non-acquiring firms (N = 2413)		Acquiring firms (N = 806)	
	Mean	Median	Mean	Median
Total compensation	1329.980	684.834	1795.643***	890.505***
Cash compensation	914.555	602.279	1084.209***	732.917***
CEO turnover	0.263	0	0.267	0
	Family firms (N = 1247)			
	Non-acquiring firms (N = 1016)		Acquiring firms (N = 231)	
	Mean	Median	Mean	Median
Total compensation	1302.722	615.850	1254.286	543.573
Cash compensation	913.324	555.350	853.811	472.610
CEO turnover	0.247	0	0.268	0
	Non-family firms (N = 1972)			
	Non-acquiring firms (N = 1397)		Acquiring firms (N = 575)	
	Mean	Median	Mean	Median
Total compensation	1349.805	742.100	2013.127***	1167.867***
Cash compensation	915.451	624.848	1176.770***	848.498***
CEO turnover	0.276	0	0.266	0
	Family CEO (N = 558)			
	Non-acquiring firms (N = 452)		Acquiring firms (N = 106)	
	Mean	Median	Mean	Median
Total compensation	1086.653	420.200	937.069	396.574
Cash compensation	814.297	414.777	695.940	351.625
CEO turnover	0.146	0	0.189	0
	Professional CEO (N = 689)			
	Non-acquiring firms (N = 564)		Acquiring firms (N = 125)	
	Mean	Median	Mean	Median
Total compensation	1475.883	779.947	1523.287	754.826
Cash compensation	992.686	678.944	987.685	663.662
CEO turnover	0.328	0	0.336	0

*** Denotes statistical significance at 1% level.

** Denotes statistical significance at 5% level.

* Denotes statistical significance at 10% level.

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