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Executive remuneration determinants: New evidence from meta-analysis

Fabián Blanes, Cristina de Fuentes and Rubén Porcuna

Facultat D'Economia, Universitat de València, Valencia, Spain

ABSTRACT

This meta-analysis takes stock of 121 C.E.O. pay studies published between 1998 and 2018 with the objective of identifying the main drivers of C.E.O. pay from a global perspective and contributing to the agency vs managerial debate on this ground. The meta-results disclose a positive C.E.O. pay–performance correlation (the highest correlation coefficient corresponds to Earnings per share with a 34%) as the agency theory prescribes and the governance policies promote. However, firm size still predominates as the main driver of C.E.O. pay (correlation coefficient is around 44%) according to managerial premises. Moreover, our results reconcile both approaches because results of the meta-regressions suggest that larger companies and more independent boards strengthen the pay–performance association. Additional analyses of moderating factors on C.E.O. pay forces do not provide robust conclusions, though, they suggest: (1) weak impact, if any, of both the Cadbury Report and the S.O.X.; and (2) lack of homogeneity in the banking industry despite its specific regulation.

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1. Introduction

C.E.O. compensation has been a spirited debate during the last two decades of the past century and still remains a controversial issue (Croci, Gonenc, & Ozkan, 2012): The global financial crisis around 2008 and high-profile corporate failures (Enron, Worldcom, Fannie Mae, General Electric) revealed that C.E.O. pay was excessive and failure-rewarding (De Andres, Reig, & Vallelado, 2018).

Two theories lie behind the two main, and widely discussed, drivers of C.E.O. pay, i.e., firm performance and firm size. Under the agency theory (Jensen & Meckling, 1976; Fama & Jensen, 1983), the pay–performance rewarding scheme provides the best alignment between the C.E.O. and the shareholder's interests.

However, according to the managerial power theory (M.P.T.) (Bebchuk & Fried, 2003), executives would rather link their remuneration to firm size, over which they

CONTACT Cristina de Fuentes dfuentes@uv.es; cristina.de-fuentes@uv.es

exert more influence through new investments or acquisitions (in spite of any damage in profits) and that may also lead to more power and prestige. Prior meta-evidence corroborates the predominance of the pay-size correlation over alternative firm's variables (Tosi, Werner, Katz, & Gomez-Mejia, 2000).

Ongoing regulatory efforts in the U.S. (e.g., S.O.X., 2002; Dodd–Frank Act, 2010) or in the European Union (e.g., FRC, 2010; EU Directive 2013/36/E; EBA, 2015), following the agency premises, pursue to strengthen the link between the C.E.O. compensation and the firm's short/long performance. Moreover, they aim to constrain the discretion in C.E.O. pay and to implement equity-based components in the compensation policies. They also promote: (1) empowering shareholders to monitor the compensation policy's compliance (say-on-pay clause); and (2) the remuneration committee consisting exclusively of non-executive or supervisory directors.

Though, little is known about the effectiveness of these Corporate Governance (C.G.) policies because executive agreements are opaque and the link between remuneration and performance is very weak or difficult to establish (OECD, 2009). In addition, archival research is not conclusive: Bebchuk and Grinstein (2005) document that, from 1993 until 2003, the total compensation had grown beyond the increase in firm size or performance because equity-based compensation had increased without reducing the non-equity part. Conversely, Chavelas (2011) report a new significant and positive C.E.O. pay–performance association after the C.G. reform that took place in Greece in 1999. Fernandes, Ferreira, Matos and Murphy (2012) also document an improvement in the C.E.O. pay behaviour triggered by the European legislative changes.

Since prior global evidence does not consider recent governance measures (Tosi et al., 2000) or only takes into account U.S.-based studies (Van Essen, Otten, & Carberry, 2015), the need to further explore the current determinants of C.E.O. pay in a multinational setting motivates this article because during the last two decades several factors might have altered prior meta-results on C.E.O. pay: (1) the Sarbanes-Oxley (S.O.X., 2002) and the Dodd Frank (2010) acts in the U.S., several European Directives 2009/385, 2013/36, 2017/828 (E.U.) and the recommendations of the Cadbury and Greenbury Reports in the U.K.; (2) new published evidence from a wide diversity of economic and institutional environments; (3) the last global financial crisis around 2008, which prompted new C.G. recommendations (OECD, 2009) and rules in the banking industry (EU Directive 2013/36/E; EBA, 2015); and (4) recent sensitive analyses (Gigliotti, 2013) providing new outcomes to integrate in the M.A. that might help to understand the C.E.O. pay behaviour.

This study aims to shed some light over this topic by integrating empirical results on C.E.O. pay in order to assess if, from a summarised view, prior tested variables currently impact on the C.E.O. compensation and to identify moderators that might explain the heterogeneity in reported findings.

We perform an M.A. on 121 studies published from 1996 until mid-2018 in J.C.R./Scopus indexed journals.

This study contributes to prior literature in a number of ways: (1) it updates and expands the scope of prior meta-analysis (Tosi et al., 2000; Van Essen et al., 2015) providing recent and worldwide meta-results; (2) it explores moderating factors that might explain C.E.O. pay behaviour; and (3) it applies a Meta-Analytic Regression

Analysis (M.A.R.A.) on the main C.E.O. pay forces providing new evidence on the agency and M.P.T. frameworks.

This study could be of interest not only for regulators and standard setters but also for other stakeholders, because the inverse causal relationship also applies: Abowd (1990), after examining C.E.O. pay in 250 large firms during 1981–1986, found that increases in the link compensation-shareholder return enhanced firm performance. Thus, the efficacy of governance regulations would benefit shareholders and third parties interested in the firm's performance. Researches can also benefit from a structured and systematic review of the, to date, published results.

2. Literature review and research questions

Two main drivers of C.E.O. pay, i.e., firm performance and firm size, and their related theories (agency and managerial theory, respectively) constitute the core of the academic debate and provide the basis for the first research question of this study.

On the one hand, scholars in economics and finance commonly follow the agency theory (Fama & Jensen, 1983; Jensen & Meckling, 1976), which advocates that the optimal contract is the one that links C.E.O. pay with performance, controlling for firm risk measures, because it closely aligns the interests of shareholders (principal) and the managers (agent) and, consequently, it reduces agency problems.

How to operationalise the construct *performance* is also debatable: The use of market-based variables, such as return to shareholders, market to book value or Tobin's Q seem to better attach shareholder and manager interests. Conversely, Bertrand and Mullaintathan (2001) claim that the stock market evolution is not entirely controlled by managers and, therefore, the use of accounting variables, i.e., R.O.A. and R.O.E. should be desirable. Worth noting, the extensive earnings management literature evidences the danger of employing accounting measures that might suffer from manipulation.

Nevertheless, vast literature documents that pay–performance relationship in privately held firms is weak (e.g., Jensen & Murphy, 1990; Tosi et al. 2010; Banghøj, Gabrielsen, Petersen, & Plenborg, 2010) and limited evidence corroborates the agency postulates (Banker, Darrough, Huang & Plehn-Dujowich, 2012).

On the other hand, rather than contradicting the agency theory, the M.P.T. explains why the C.E.O. compensation is, in many cases, part of the problem, rather than the solution itself (Bebchuk & Fried, 2003; 2004) and the reason for a pay-size correlation higher than the pay–performance one (Tosi et al., 2000; Van Essen et al., 2015). Executives prefer to link their remuneration to the firm size because they exert more control over the firm growth (through new investments and/or acquisitions) and managing bigger firms also leads to more power and prestige. In addition, the increasing organisational complexities and human capital needs of growing companies seem to better justify their remuneration (Chalmers, Koh, & Stapledon, 2006).

Then, C.E.O.'s preferences (higher pay and lower pay–performance association) would prevail upon the shareholder's ones (lower pay and higher pay–performance association) in those firms with weaker governance mechanisms and higher C.E.O. power over-the-board. In this context, C.E.O.s might influence board decisions on the rewarding agreements that are prone to satisfy C.E.O.s rather than shareholder's

interests. Hence, remuneration might be higher and tighter to firm size than it should be desirable.

In consequence, according to M.P.T., we expect 'good' boards, that is, boards that are not too big to face problems of coordination and communication (Jensen, 1993; Yermack, 1996); active (Vafeas, 1999) and independent (Fama & Jensen, 1983; Core, Holthausen, & Larcker, 1999) result in less C.E.O. pay and higher pay–performance association. However, some studies reported a positive association between *Board Independence* and C.E.O. pay because the external members seem to be more influenced by C.E.O.s (Wade, O'Reilly, & Chandratat, 1990; Lambert, Larcker, & Weigelt, 1993; Boyd, 1994). In this vein, C.E.O. duality (C.E.O. that also chairs the board) is also expected to influence on the rewarding agreements.

Researchers have also explored a wide assortment of C.E.O.-related variables: Commonly, C.E.O. Age and C.E.O. Tenure control for the superior skill management associated with higher experience and expertise that triggers, ultimately, higher executive compensation.

Ownership concentration is negatively associated with C.E.O. pay, because a high number of shareholders hinders a good coordination and supervisory function (Schwalbach, 1990; Core et al., 1999). The relationship between firm's leverage and C.E.O. pay also commonly turns up to be negative, because financial institutions refuse financing firms without minimal governance principles (Jensen, 1986).

However, empirical evidence confirming the M.P.T. is not conclusive (Murphy, 2002). For instance, the simultaneous increase in C.E.O. pay and either the increase in the board independence (Conyon, 2006; Hall & Murphy, 2003) or shortened C.E.O. tenure (Kaplan, 2008) raise doubts over managerial premises. Conversely, Core et al. (1999) concluded that C.E.O. earns greater compensation when governance structures are less effective.

The M.A.s provided by Tosi et al. (2000) and Van Essen et al. (2015) conclude that firm size explained more significantly the variance in total C.E.O. pay than performance measures. This may support the transcendence of managerial preferences supported by M.P.T.

However, none of them includes relevant governance measures (Dodd–Frank Act of 2010, Section 952; FRC, 2010 or E.U. Directive 2013/36/E) and the research conducted by Van Essen et al. (2015) is only focused on U.S. firms. Therefore, since this study aims to update and test in a multinational setting the M.P.T./agency theory, we posit the following research question:

RQ1: According to prior reported results, which are the variables that exhibit the highest association with C.E.O. pay?

Moderating factors

Governance codes and regulation: the Cadbury and Greenbury reports and the S.O.X

During the period that covers this M.A., the evolution of pay–performance might have been shaped by the successive C.G. Codes and regulations. In particular, we explore the influence of the following moderating factors:

1. The issuance of C.G. recommendations. Ozkan (2011) revealed that the aim of the British Cadbury (1992) and Greenbury (1995) Reports to more closely link C.E.O. pay to firm performance had not been totally effective. Likewise, the results of Girma, Thompson and Wright (2007) suggested that the impact of Cadbury reforms had been disappointing, the pay-performance link had been reduced, and the pay-size link had been reinforced.
2. The approval of mandatory legislation. In addition to the typical 'complain or explain' approach of G.C. codes, in the U.S., mandatory legislation such as S.O.X. (2002) might have altered the main C.E.O. pay forces. Chang, Choy, and Wan (2012) observed, after examining 1,500 S&P firms, that S.O.X. induced to weak alignment between shareholders and C.E.O.s. However, S.O.X. prompted a positive impact on pay–performance (Chen, Jeter, & Yang, 2015) and significant increases in total compensation (Wang, 2010).

Due to the limited availability of publications in other countries, we restrict the exploration to how British Cadbury and Greenbury Codes and the American S.O.X. moderate reported findings, by investigating this research question:

RQ2: Does the issuance of the Cadbury–Greenbury Reports in the U.K./the approval of S.O.X. in the U.S. explain the heterogeneity of prior reported results?

Financial industry

In the aftermaths of the financial crisis, in order to restore trust in the financial industry (De Bondt, 2013), among other measures, authorities have released new rules and guidelines on C.E.O. remuneration practices in the banking industry (EU Directive 2013/36/E; EBA, 2015), because financial institutions were paying bonuses to the managers responsible for the banks' collapse. As a consequence of those measures, De Andres et al. (2018) document a significant increase (88%) in the fixed remuneration over variable pay in 2014 compared to 2013.

Since the banking industry is subject to specific regulation, their published results might offer homogeneity. However, in most studies, the sample does not specify whether they include the financial industry or not and, therefore, we cannot disentangle the correlation coefficients of the banking industry from the remaining industries. Thus, we explore the following research question in order to identify whether the C.E.O. pay drivers are homogeneous in the financial sector:

RQ3: Does the industry (financial vs total industry) explain the heterogeneity of prior reported results?

Dependent variables

C.E.O. pay investigations have explored the two components of the *Total compensation*, that is, *Cash and Non-cash components*, the latter pursuing to increase pay–performance sensitivity. However, Buck, Liu, and Skovoroda (2008) confirmed that, while increasing C.E.O.'s total rewards, the presence of non-cash incentives is associated with reductions in pay–performance sensitivity.

Brick, Palmon, and Wald (2006) also split the dependent variable into *C.E.O. compensation* and *Executive compensation* and concluded that both variables were correlated, revealing possible problems of complicity inside the companies.

In consequence, we have explored whether the operationalisation of the construct C.E.O. pay through the above mentioned variables also moderate prior findings, through the following research question:

RQ4: Does the operationalisation of the dependent variable (i.e., C.E.O. vs Executive and Cash vs Non-cash compensation) explain the heterogeneity of prior reported results?

3. Sample and meta-analytical procedures

3.1. Sample of study

This M.A. covers archival research written in English, published between January 1996 and July 2018 and included in several databases and editorial sources such as I.S.I., W.o.S., ScienceDirect, Dialnet, Emerald and S.S.R.N. By using the keywords 'pay–performance', 'C.E.O. compensation', 'C.E.O. pay', 'executive compensation', 'compensation performance', 'pay sensitivity' and 'pay elasticity', the initial search reported 1,343 articles. After discarding duplicates and studies from different subjects, the initial sample consists of 225 articles. Table 1 displays the exclusion criteria which trigger a final sample of 104 publications. In some publications there are more than one statistical analysis over independent samples that are suitable for the M.A. Hence, the meta-data is nourished by the results of 121 regressions executed over either absolute values (98) or incremental values (23) of the exploratory variables.

The final sample (details in Table 2) covers a wide range of countries. Unsurprisingly, the Anglo-Saxon countries[1] (U.S., U.K., Australia, Canada) predominate (49 studies) being the U.S., the most analysed environment (31 investigations). In second place, the continental Europe is the focus of 33 studies. Finally, in the Asian region, China heads the list (12 studies out of 30).

The vast majority of studies (81 out of 104) cover periods prior to the 2008 global financial crisis and only 23 investigations explore samples collected during and after this event.

Table 1. Sample selection process.

	Number of publications	%
Results offered by keywords search	1,343	
Studies from different areas	1,118	
Initial sample	**225**	100
Criteria leading to exclusion of publications		
• Not indexed in JCR/SCOPUS index	33	14.67
• Dependent variable is not executive/C.E.O. compensation	26	11.56
• Results non-transformable into r values	2	0.89
• Different model/approach to executive pay	37	16.44
• Theoretical and narrative articles	23	10.22
Final sample of publications	**104**	46.22
• Studies performed over absolute values of independent variables	98	
• Studies performed over incremental values of independent variables	23	
Final sample of studies conforming the M.A.	**121**	

Table 2. Sample distribution by author.

Authors	Date	Journal	Period	Country	Size
Adithipyangkul	2011	*Asia Pacific Journal of Management*	1999–2004	China	3,706
Ahn	2014	*Journal of Applied Business Research*	1992–2003	U.S.	7,193
Akhigbe, Madura, and Ryan	1997	*Managerial Finance*	1989–1993	U.S. (commercial banks)	245
Al-Najjar, B.	2017	*Tourism Management*	2003–2012	U.K. (travel & leisure)	260
Alves, Barbosa, and Morais	2016	*Research in International Business and Finance*	2002–2011	Portugal	400
Amzaleg, Azar, Ben-Zion, and Rosenfeld	2014	*Journal of Economic Behavior & Organization*	1998–2002	Israel	675
Anderson, Banker, and Ravindran	2000	*Management Science*	1992–1996	U.S. technology industry	8,291
Andreas, Rapp, and Wolff	2012	*Review of Managerial Science*	2005–2008	Germany	928
Ang and Constand	1997	*Journal of Multinational Financial Management*	1982–1992	Japan	362
Banghoj, Grabielsen, Petersen, and Plenborg	2010	*Accounting & Finance*	2007	Denmark	125
Banker, Darrough, Huang, and Plehn-Dujowich	2012	*The Accounting Review*	1993–2006	U.S.	15,512
Barontini and Bozzi	2011	*Journal of Management & Governance*	1995–2002	Italy	1,722
Basu, Hwang, Mitsudome, and Weintrop	2007	*Pacific-Basin Finance Journal*	1993–1997	Japan	750
Bebchuck and Grinstein	2006	*Oxford Review of Economic Policy*	1993–2003	U.S.	15,397
Benito and Conyon	1999	*Journal of Management and Governance,*	1985–1994	U.K.	1,145
Brick, Palmon, and Wald	2006	*Journal of Corporate Finance*	1992–2001	U.S.	5,923
Brockman, Lee, and Salas	2016	*Journal of Corporate Finance*	1996–2007	U.S.	10,017
Brunello, Graziano, and Parigi	2001	*International Journal of Industrial Organization*	2000–2001	Italy	298
Buachoom	2017	*Asian Review of Accounting*	2000–2014	Thailand	5,911
Buck, Liu, and Skorovoda	2008	*Journal of International Business Studies*	1997–1998	U.K.	1,602
Callan and Thomas	2014	*Corporate Social Responsibility and Environmental Management*	2003–2005	U.S,.Canada	864
Canarella and Gasparyan	2008	*Managerial Finance*	1996–2002	U.S.	286
Canarella and Nourayi	2008	*Managerial and Decision Economics*	1997–2002	U.S.	594
Cao, Pan, and Tian	2011	*Journal of Corporate Finance*	2002–2007	China	3,286
Chalevas and Tzovas	2010	*The International Journal of Accounting*	2000–2003	Greece	117
Chang, Choy, and Wan	2012	*Review of Quantitative Finance and Accounting*	1994–2005	U.S.	4,714
Chen, Jeter, and Yang	2015	*Journal of Accounting and Public Policy,*	1993–2005	U.S.	6,930
Cheng and Firth	2006	*Managerial and Decision Economics*	1994–2002	China (Hong Kong)	3,024
Chung, Judge, and Li,	2015	*Journal of Corporate Finance*	2005–2009	Taiwan	4,930
Conyon and He	2011	*Journal of Corporate Finance,*	2001–2005	China	5,928
Conyon and Schwalbach	2000	*Long Range Planning*	1968–1994	Germany	1,246

(*continued*)

Table 2. Continued.

Authors	Date	Journal	Period	Country	Size
Conyon, Peck, and Sadler	2000	*Managerial Finance*	1985–1995	U.K.	293
Core, Holthausen, and Larcker	1997	*Journal of Financial Economics*	1982–1984	U.S.	495
Correa and Lel	2016	*Journal of Financial Economics*	2002–2012	Worldwide	23,127
Crespí-Cladera and Gispert	2003	*Labour*	1990–1995	Spain	306
Croci, Gonenc, and Ozkan	2012	*Journal of Banking & Finance*	2001–2008	Continental Europe	3,731
Cuñat and Guadalupe	2009	*Journal of Banking & Finance*	**1994,1999**	U.S. (banking, financial)	13,055
Davila and Penalva	2007	*Review of Accounting Studies*	1993–2002	U.S.	6,537
Doucoulagios et al	2007	*Corporate Governance: An International Review*	1992–2005	Australia (banking)	141
Duffhues and Kabir	2008	*Journal of Multinational Financial Management*	1998–2001	Netherlands	521
Duong and Evans	2015	*Pacific-Basin Finance Journal*	2006–2010	Australia	563
Duru and Iyengar	1999	*Managerial Finance*	1992–1995	U.S. (electric util. Ind.)	225
Edwards	2009	*Economics of Governance*	1989–1993	Germany	1,145
Elsayed and Eldarban	2018	*Journal of Applied Accounting Research*	2010–2014	U.K.	1,422
Elston and Goldberg	2003	*Journal of Banking & Finance,*	1970–1986	Germany	1,365
Eriksson	2005	*Economics of Transition*	1999–2000	Czech Republic	446
Eriksson and Lausten	2000	*Scandinavian Journal of Management,*	1993–1994	Denmark	120
Fernandes	2008	*Journal of Multinational Financial Management*	2002–2004	Portugal	139
Firth, Lohne, Ropstad, and Sjo	1996	*Managerial and Decision Economics*	1994	Norway	95
Firth, Fung, and Rui	2006	*Journal of Corporate Finance*	1998–2000	China	1,098
Gao and Li	2015	*Journal of Corporate Finance*	1999–2011	U.S.	52,898
Ghosh	2006	*Emerging Markets Finance and Trade*	1997–1992	India	600
Gigliotti	2013	*The International Journal of Human Resource Management*	2005–2009	Italy	145
Girma, Thompson, and Wright	2007	*The Manchester School*	1981–1996	U.K.	2,891
Gu and Choi	2004	*Journal of Hospitality & Tourism Research*	1995–1999	U.S. (casino industry)	101
Hall and Liebman	1998	*The Quarterly Journal of Economics*	1980–1985	U.S.	5,680
He	2008	*Journal of Business Venturing*	1998–2002	U.S.	4,344
Herdan and Szczepańska	2011	*Foundations of Management*	2007–2010	Poland	30
Hermalin and Wallace	2001	*Journal of Financial Economics*	1988–1993	U.S. (saving and loans)	104
Izan, Sidhu, and Taylor	1998	*Corporate Governance: An International Review*	1987–1992	Australia	587
Jaiswall and Firth	2009	*International Journal of Corporate Governance*	1999–2003	India	970
Jaiswall, Kumar, and Bhattacharyya	2016	*Journal of Contemporary Accounting & Economics*	1999–2013	India	5,045
Jones and Kato	1996	*Labour Economics*	1989–1992	Bulgaria	812
Kato y Kubo	2006	*Journal of the Japanese and International Economies*	1986–1995	Japan	118
Ke	2012	*Review of Accounting Studies*	2003–2004	China (Hong Kong)	457
Kim, Kato, and Lee	2004	*Economic development and cultural challenge*	1998–2001	Japan	543
Kirsten and Toit	2018	*South African Journal of Economic and Management Sciences*	2006–2015	South Africa	420
Leone	2006		1993–2003	U.S.	9,858

(*continued*)

Table 2. Continued.

Authors	Date	Journal	Period	Country	Size
		Journal of Accounting and Economics			
Li, Moshirian, Nguyen, and Tan	2007	*Research in International Business and Finance*	2000–2001	China	298
Lin	2004	*Asian Review of Accounting*	1998	Taiwan	201
Lin, Liao, and Chang	2011	*Total Quality Management*	2004–2006	Taiwan (high-tech business)	1,175
Luo	2015	*Journal of the Economics of Business*	2005–2012	China	214
Luo and Jackson	2011	*Global Business and Finance Review*	2001–2009	China (financial firms)	108
McKnight and Tomkins	1999	*Journal of the Economics of Business*	1992–1995	U.K.	97
Merhebi, Pattenden, and Swan	2006	*Accounting & Finance*	1990–1999	Australia	2,199
Merino, Manzaneque, and Banegas	2012	*Studies in Managerial and Financial Accounting*	2004–2009	Spain	456
Mitsudome, Weintrop, and Hwang	2008	*Journal of the Japanese and International Economies*	1993–1997	U.S.	2,399
Murphy and Conyon	2000	*Economic Journal*	1997	U.S.	1,665
Nourayi and Daroca	2008	*Managerial Finance*	1996–2002	U.S.	663
Nourayi, and Mintz,	2008	*Managerial Finance*	2001–2002	U.S.	3,133
Ntim, Lindop, Osei, andThomas	2015	*Managerial and Decision Economics*	2003–2007	China	845
ÓNeill and Lob	1999	*Asia Pacific Journal of Human Resources*	1997	Australia	49
Ozkan	2011	*European Financial Management*	1999–2005	U.K.	1,719
Ozkan	2007	*Journal of Multinational Financial Management*	2003–2004	U.K.	414
Parthasarathy, Menon, and Bhattacherjee	2006	*Economic and Political Weekly*	2004–2005	India	409
Raithatha and Komera	2016	*IIMB Management Review*	2002–2012	India	12,799
Randøy and Nielsen	2002	*Journal of Management and Governance*	1998	Norway	224
Rashid	2013	*International Journal of Management,*	2000–2009	Bangladesh	843
Sánchez-Marín, Baixauli, and Lucas	2010	*The International Journal of Human Resource Management*	2004–2006	Spain	120
Sapp	2008	*European Financial Management*	2000–2005	Canada	416
Saravanan, Srikanth, and Avabruth	2018	*Social Responsibility Journal*	2005–2014	India	2,556
Schultz, Tian, and Twite	2013	*International Review of Finance*	2000–2010	Australia	6,189
Shah, Javed, and Abbas	2009	*International Research of Economics*	2002–2006	Pakistan	570
Sheickh, Shah, and Akbar	2018	*Applied Economics*	2005–2012	Pakistan	1,508
Sigler and Carolina	2011	*Business and Economics Journal*	2006–2009	U.S.	1,121
Smirnova and Zavertiaeva	2017	*Research in International Business and Finance*	2009–2013	EU and Switzerland	1,338
Su	2012	*Asian Business & Management*	1999–2007	China	41,180
Sun, Wei, and Huang	2013	*Review of Accounting and Finance*	2000–2006	U.S. (property & liability ind.)	139
Unite, Sullivan, Brookman, Majadillas, and Taningco	2008	*Pacific-Basin Finance Journal*	2001–2003	Philippines	273

(*continued*)

Table 2. Continued.

Authors	Date	Journal	Period	Country	Size
Veliyath	1999	*Journal of Management Studies*	1986–1990	U.S. (pharmaceutical)	46
Wang	2010	*Journal of Accounting Research*	1998–2005	U.S.	16,165
Zhou	2000	*Canadian Journal of Economics*	1991–1995	Canada	2,310
Zhou, Georgakopoulos, Sotiropoulos, and Vasileiou	2011	*Asian Social Science*	2002–2009	China (financial enterprises)	79
Zhou	1999	*Journal of Corporate Finance*	1991–1994	U.S.–CANADA	2,245

3.2. Research design

All variables related to size, leverage, performance and C.G. characteristics of the companies are specified in Appendix 1.

This study applies M.A. techniques introduced by Hunter, Schmidt, and Jackson (1982) as it follows:

1. The Pearson correlation coefficients (r)[2] reported in the studies of the sample are the data source to estimate the global effect size of the relationship between executive-pay and the explanatory variables.[3] In order to assess those coefficients, the scale developed by Cohen (1988) has been applied.
2. We assumed homogeneity in the results if 75% or more of the observed variance was explained by the sampling error and if the statistic of the Q test was not significant. Otherwise, when effect magnitudes were heterogeneous, we tried to identify the moderating variables chosen from our previous narrative review.
3. The so-called 'filed drawer problem'[4] (or publication bias towards significant results) results in higher M.A. coefficients than they should be otherwise (Wolf, 1986, p.37). In order to address this issue, we computed the Safe N (Rosenthal, 1979).
4. To identify whether the exploratory variables significantly influence the pay–performance association, we run a meta-regression following the M.A.R.A. procedure (Lipsey & Wilson, 2001) with the modifications proposed by Harbord and Higgins (2008), which include the improvement of the algorithm for the estimation of the between-study variance by residual maximum likelihood (R.E.M.L.) and the modifications suggested by Knapp and Hartung (2003). The dependent variable is the effect size of the association between performance and C.E.O. pay, computed from t-statistics and degrees of freedom of primary studies (Greene, 2008).

4. Results

4.1. Effect size of the main variables

Columns 1 to 5 in Table 3 disclose the number of published studies and the estimated coefficient of the association between the explanatory variables and C.E.O. pay. The most prolific line of investigation explores the association between firm's

Table 3. Hunter and Smith meta-analysis on C.E.O. pay and explanatory variables.

Panel A. C.E.O. pay measured in absolute values

	Studies					Zrm		Safe N (p = 0.05)	Homogeneity contrasts	
	N (1)	**Total** (2)	**Positive** (3)	**Negative** (4)	No Significant (5)	(6)		(7)	% Variance explain. (8)	X^2 (9)
Firm performance										
Share Return	243,931	67	40	1	26	0.069	#	21,195	5.701	***
R.O.A.	210,639	59	40	2	17	0.065	#	12,726	5.623	***
R.O.E.	53,706	24	16	0	8	0.093	#	1,948	8.261	***
Market to Book value	26,891	14	8	2	5	0.060	#	489	2.314	***
Earnings per share	2,499	6	5	0	1	0.338	#	419	4.263	***
Tobin's Q	58,577	17	12	1	4	0.072	#	1,499	4.834	***
Firm size										
Total Sales	12,984	14	14	0	0	0.430	#	8,468	2.575	***
Log (Sales)	120,342	32	31	0	1	0.335	#	55,110	0.474	***
Total Assets	16,931	14	11	1	2	0.443	#	8,105	1.358	***
Log (total assets)	132,855	23	20	0	3	0.276	#	22,501	0.321	***
Market Capitalisation	11,541	7	7	0	0	0.242	#	1,242	1.361	***
Governance characteristics										
Board Size	58,432	32	22	3	7	0.183	#	15,001	1.261	***
Board Meeting	9,092	9	3	1	5	−0.103	#	25	5.470	**
Board Independence	68,189	21	13	3	5	0.029	#	349	7.879	***
Ownership Concentration.	13,354	9	1	6	2	−0.063	#	184	9.598	***
C.E.O. duality	116,224	27	13	6	8	0.018	#	42	4.882	***
C.E.O. Ownership	89,851	25	5	8	12	−0.010	#	1,908	4.963	***
C.E.O. tenure	91,906	22	9	3	10	0.029	#	2,138	3.211	***
C.E.O. age	85,807	19	7	2	10	0.023	#	201	22.752	***
Leverage	165,710	28	8	8	12	0.009	#	115	4.471	***
Panel B. C.E.O. pay measured in incremental values										
Firm performance										
ΔShare Return	37,430	19	12	0	7	0.142	#	3318	4.313	***
ΔR.O.A.	10,273	8	4	0	4	0.217	#	0	3.294	***
ΔR.O.E.	13,496	3	1	0	2	0.061	#	57	2.433	***
Firm size										
ΔFirm size (Aggregated)	23,372	13	7	1	5	0.034	#	182	4.175	***

Notes: Variables described in Appendix 1.
X2 test: * significant at 10% level; ** significant at 5% level; *** significant at 1% level.
Zrm is significant at 5%, that is, the 95% interval of confidence does not include zero.

performance and our variable of interest. In particular, 67 studies explore the impact of *Share return* on C.E.O. pay: 40 offered a positive significant relationship, one displayed negative coefficient and 26 resulted in no-significant results. The correlation coefficient offers a positive value of 0.069 included in the 95% confidence interval. We can claim that there is no publication bias, because we would need 21,195 studies (Safe N) with null results to fail to reject the null hypothesis of no significant effect of Share return on C.E.O. pay. The hypothesis of homogeneity is consistently refused: Only 5.701% of the observed variance is due to sampling error and the X^2 coefficient is significant at 1%, therefore the differences within the published outputs are due to unobserved/underlying variables that could explain the diversity in the results. Similar explanations apply to the remaining firm performance measures. Notably, the variable that offers the highest correlation coefficient with C.E.O. pay is *Earnings per share* (0.338).

Among the set of governance characteristics, the *Board Size* coefficient is positive and significant in 22 out of 32 studies and displays the highest correlation value (0.183). On the contrary, the more active the board the lower the C.E.O. pay (the coefficient of *Board Meetings* is -0.103), although we need to be cautious in drawing any conclusion because the number of published studies reporting on this variable is low (nine cases) and the Safe N is also the lowest of the M.A. (25 studies). Ownership concentration is also negatively correlated with C.E.O. pay. The remaining C.G. characteristics (*C.E.O. tenure*, *C.E.O. age* and *C.E.O. duality*) display positive coefficients although with low effect sizes (0.029, 0.023 and 0.018 respectively). As expected, every measure of firm size displays high and positive correlation coefficients with C.E.O. pay and the Safe N values are high. The published results are heterogeneous according to the percentage of variance explained and the X^2 tests.

Finally, *Leverage* is positively related to our variable of interest, although it offers the lowest coefficient (0.009).

According to Cohen's (1988) scale, all the effect sizes (untabulated) are low but earnings per share and board size (that exhibit medium values).

Panel B of Table 3 reports the M.A. results on published sensitive analyses, that is, the regressions performed over incremental values, in order to determine the elasticity of C.E.O. pay in relation with the exploratory variables, following the model developed by Murphy (1985) and Coughlan and Schmidt (1985). All coefficients in Panel B display a significant association with C.E.O. pay, being the elasticity related to R.O.A. and Shareholder Return the one that offers the highest values. Yet again, all variables lack from homogeneity within published outputs due to underlying (not considered) variables. Therefore, the exploration of moderating variables is pertinent.

4.2. Results related to moderating variables

Table 4 shows the conclusions driven by the significant results (not reported for brevity) of applying the moderating factors in order to answer the research questions *RQ2–RQ4*.

Regarding firm performance measures, in the U.K. context, only the published outcomes on the Share return-C.E.O. pay association and in the post-Cadbury period

Table 4. Summary of Hunter and Smith meta-analysis using moderating factors.

	Homogeneous group	Sign	Comparison with the non-homogeneous group
Firm performance			
Share return	Post-Cadbury	+	<
R.O.E.	U.S. pre-S.O.X.	+	>
Firm size			
Total Sales	Total Industry	+	<
Total Assets	Total Industry	+	<
Log (total assets)	Total Industry	+	<
Market Capitalisation	Total Industry	+	<
Governance characteristics			
Board Meeting	Executive compensation	+	>
C.E.O. Ownership	U.S. pre-S.O.X.	+	>

Variables described in Appendix 1.

exhibit significant homogeneity. Notably, the coefficient is positive but lower than in the pre-Cadbury group of studies (as in Girma & Thompson, 2007). In the same vein, in the U.S. setting, the R.O.E.-C.E.O. pay association is higher in the pre-S.O.X. than in the following years although only the results in the pre-S.O.X. period are homogeneous. Thus, our results do not suggest a clear effectiveness of the governance measures in increasing the pay–performance association.

None of the tested variables moderates firm's size measures but total industry (the group that excludes the publications focused on the banking industry). Hence, despite the specific banking regulation, we failed to find a consistent behaviour of any variable attached to C.E.O. pay in the financial industry.

Within the set of governance characteristics, the study reveals homogeneity only in the results related to: (1) C.E.O. Ownership–C.E.O. pay association with a higher coefficient than the one referred to the pre-S.O.X. period; and (2) the Executive (executive positions other than C.E.O.) pay and the board meetings.

Additionally, in undisclosed tables, we have performed the M.A. using additional moderating variables such as the geographical region (E.U. vs Non-E.U. countries or U.S. vs non-U.S. based studies) the legislative setting according to both Anglo-Saxon vs Non-Anglo-Saxon countries and Civil vs Code Law countries, and type of compensation (Total compensation vs Cash compensation), but we failed to find homogeneous groups.

4.3. Results of the meta-regression

We run the meta-regression on a model where the dependent variable consists of the effect size of the C.E.O. pay–performance association, being the independent variables all the determinants considered in the meta-analysis and displayed in Table 3. The set of exploratory variables adopts a dichotomy form, which equals 1 if they are included in the models tested in the primary studies and 0 otherwise. In addition, we also include some variables such as the *Number of variables in the tested regressions* and the *Median year sample window*, both in absolute values (as in Van Essen et al., 2015).

MARA results (Table 5) indicate that the association between performance and C.E.O. pay is moderated when the firm's size and the number of board independent members are included, showing both positive and significant coefficients. That is, the

Table 5. M.A.R.A. procedure using effect sizes of performance-compensation association.

Variables	Coef.	t-statistic
Market performance	0.0251	(1.029)
Size	0.0608*	(1.762)
Board size	0.0151	(0.508)
Board meetings	−0.0368	(−1.007)
Board independence	0.0643**	(2.058)
Ownership concentration	−0.0010	(−0.027)
C.E.O. duality	0.0311	(1.211)
C.E.O. ownership	−0.0143	(−0.537)
C.E.O. tenure	−0.0170	(−0.585)
C.E.O. age	0.0029	(0.090)
Leverage	0.0267	(1.042)
Number of variables in regression	−0.0158	(−1.565)
Median year sample window	−0.0011	(−0.704)
Constant	2.1948	(0.726)
R^2	0.02	
Observations (number of effect sizes)	98	
Qres (p-value)	2,5 e^{06}	(0.000)***
Qmodel (p-value)	2,5 e^{06}	(0.000)***

Notes: Q is the homogeneity test, Qres is based on the residual homogeneity statistic and Qmodel is based on the R.E.M.L. log likelihood.

larger companies and the more independent boards strengthen the association between firm's performance and C.E.O. pay.

Moreover, ownership concentration, although not significant, displays a positive association with C.E.O. pay–performance relationship (contrary to Bebchuk & Fried, 2004). Thus, further research on this field would help to a better understanding of the ownership structure and C.E.O. power over the board.

5. Discussion and conclusions

5.1. Discussion of the main effects results

We extend prior M.A. (Tosi et al., 2000) by analyzing results published in the last two decades that have witnessed a worldwide proliferation of Governance codes.

This study contributes to the agency theory–M.P.T. debate, from a global perspective, in the following terms: Our results reveal that in absolute values: (1) the pay–performance association is significant although all effect sizes are low but earnings per share that exhibits a medium value (according to the scale by Cohen, 1988); and (2) firm size still displays the highest correlation with C.E.O. pay (around 44%). However, deeper insights from elasticity analyses suggest that C.E.O. pay is more sensitive to variations in performance variables (both market and accounting based measures) than to firm size changes. A plausible explanation for this finding is that ongoing governance measures are modifying rewarding schemes though they exhibit stickiness to size variables due to the organisational complexity and risk exposure of large firms (Diez Esteban, García-Gómez and López-Iturriaga, 2013).

Since the M.A. does not test the causal effect, deeper insights through M.A.R.A. results also support that pay–performance increases with board independence (as agency theorists predict) and firm size (i.e., preserving C.E.O.s interests according to M.P.T.). Hence, our results reconcile rather than alternate both theories.

Moderator variables offer miscellaneous results and do not support robust conclusions. They barely suggest: (1) that governance measures (in particular the Cadbury Code and S.O.X.) had, if any, a detrimental effect in the pay–performance association; and (2) the C.E.O. pay in the banking industry does not offer a homogeneous pattern. In addition, dichotomies related to institutional or geographical regions, such as Anglo-Saxon vs Non-Anglo-Saxon; E.U. vs non-E.U.; Civil vs Common Law countries failed to further explain heterogeneity in prior findings.

These results help to understand the somehow contradictory empirical evidence and to provide solid foundations for future hypotheses developments. This contribution is also relevant to the regulatory bodies and standard setters because our results reveal that, in order to harmonise shareholders and managers' interests, the pay–performance association still needs further factual implementation of governance measures.

Limitations and further research

Among the limitations of this study, the use of meta-analytic structural equations could offer additional results and reduce the possibility of omitted variables bias. Endogeneity concerns could also be addressed, in particular, how remuneration policies influence performance (De Andres et al., 2018).

Future research should be devoted to test alternative theories. Also, additional investigation over unexplored areas, such as Latin America or Russia, might help to understand peculiarities and differences of governance systems across countries.

Notes

1. As identified in http://www.oxfordreference.com/view/10.1093/oi/authority.20110803095413570
2. The *r* correlation coefficient was reported in 35 studies. In the remaining cases, *t-statistics*, *b* parameters, *p-values* or standard errors were used to estimate partial correlation (following Rosenthal & DiMatteo, 2001).
3. When necessary, in order to avoid problems generated by high standard deviation in *p* values, we computed the Pearson correlation coefficient normalised by Fisher's Transformation (Zr).
4. Studies with 'no significant results' are likely unpublished due to either the editors' preferences or the researches inhibition from sending papers when they failed to verify the formulated hypotheses.

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Appendix 1

Variables	Definition
Firm Performance	
Share Return	Total return of a stock to an investor. Share price appreciation plus dividends paid to shareholders.
Return on assets (R.O.A.)	Net income divided by total assets
Return on equity (R.O.E.)	Net income divided by total equity
Market to Book Value	Firm's market value divided by the firm's book value
Earnings per share	Net profit after taxes divided by the number of equity shares.
Tobin's Q ratio	Book value of total assets minus the book value of common equity plus the market value of common equity divided by the book value of total assets.
Firm Size	
Total Sales	Absolute value of firm's revenues
Log (Sales)	Natural logarithm of firm's revenues
Total Assets	Absolute value of firm's total assets
Log (Assets)	Natural logarithm of firm's total assets
Market Capitalisation	Total market value of a company's outstanding shares.
Firm Characteristics	
Leverage	Total debt divided by Equity
Governance Characteristics	
Board Size	Number of Board of Director members
Board Meetings	Number of Board of Directors meetings per year
Board Independence	Number of Non-executive board members
Ownership Concentration	The amount of stock owned by individual investors and large-block shareholders
C.E.O. duality	The C.E.O. is also the Chairman of the Board.
C.E.O. Ownership	The C.E.O. earns any stock-based compensation (stocks or options)
C.E.O. tenure	Number of years of C.E.O. in the firms
C.E.O. age	Experience of C.E.O.