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The role of financial performance of Eurostoxx listed hotel companies in determining CEO compensation

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ABSTRACT: This paper is focused on the effect of firms' financial performance in the compensation of CEOs of Eurostoxx listed hotel firms. We analyze CEO cash-, equity-, and total-compensation using as proxies of financial performance both accounting-based and market-based measures, where both return and risk are considered. Market-based financial risk measure enables us to delve into the relationship between CEO compensation policies and lagged firms' systematic and idiosyncratic risk components computed by using a well-known asset-pricing factorial model. Results show a non-significant linear relationship between CEO compensation policies and stock return in the Eurostoxx hotel firms even when we control for market-based risk. However, results support a negative and significant relationship between lagged financial risk and CEO equity compensation that is more intensively related with the firms' idiosyncratic risk component. Moreover, we show evidence of a non-linear effect of financial return on CEO cash compensation that is idiosyncratic-risk-level dependent.

KEYWORDS: Accounting-based performance; Asset pricing factorial models; CEO compensation components; Corporate governance mechanisms; Idiosyncratic risk; Market-based performance; Systematic risk.

1. Introduction

CEO compensation policies, that set CEO salaries and the multiple benefits linked to them, have long been a controversial subject and a relevant topic in the agency theory framework. CEOs may have opportunities and incentives to expropriate firm or stakeholder wealth (Stroh et al., 1996; Lemmon and Lins, 2003; Kim and Gu, 2005; and Dowell et al., 2011) because they have the capacity to influence the design of their own compensation policies (Byrd et al., 1998). Hence, agency theory relationships can be violated when CEOs (agents) have business goals and interests that diverge from those of shareholders (principals) (Jensen and Meckling, 1976). Therefore, firm corporate governance structures address this issue, and the international guidelines related to corporate governance codes focus on the control and transparency of CEO compensation (Jensen and Murphy, 1990; and Dowel et al., 2011).

Since abnormal CEO compensation has led to multiple scandals across the world, a wide body of literature has focused on what kind of factors influence the setting of corporate compensation systems. In traditional agency theory, the setting of CEO compensation depends on underlying firm characteristics. Jensen and Meckling (1976) argue that ownership structure, executive compensation structure and board composition are determined by each other and by the nature of a firm´s business (e.g., firm size, cash flow pattern and business risk).

In the related literature, we identify works that link CEO compensation to firm characteristics, including corporate governance mechanisms (Fama and Jensen, 1983; and Ozkan, 2007). The main factors included in these analyses are related to firm size and financial structure, the structure and leadership of the board of directors, the ownership structure, and firm performance. In fact, agency theory suggests that compensation systems should be linked to firm profitability and stock performance with the aim of motivating top managers to achieve firm objectives and maximize shareholder wealth while avoiding the divergent interests between them (Jensen and Meckling, 1976; Agrawal et al., 1991; and Mehran, 1995).

Previous empirical literature includes accounting-based financial performance as an explanatory factor of managerial compensation (among others: Mehran, 1995; Brick et al., 2006; and Conyon and He, 2011). In this literature, the accounting-based measures commonly used to proxy financial performance are the ratios of return on assets (ROA)

and return on equity (ROE). This literature shows mixed and inconclusive evidence on the role of accounting-based financial performance in determining CEO compensation.

In addition, we also find previous literature in which market-based return, in many cases jointly with accounting-based measures, is used as firm financial performance (among others: Firth et al., 2006; Ozkan 2011; and Banker et al, 2013). This is done without loss of generality, since principal-agent conflicts arise in publicly owned corporations. But again, the evidence showed is inconclusive.

Finally, we find papers in which financial returns are controlled for risk, as the asset-pricing theory suggests, usually measured with the realized volatility of stock returns (among others: Core et al., 1999; Brick et al., 2006; Conyon et al., 2011; and Brokman et al., 2016). Moreover, some of these papers decompose the total financial risk of the firms into systematic and idiosyncratic risk using asset-pricing models (Miller et al., 2002; Gómez-Mejía et al., 2003; and Conyon et al., 2011). However, this literature shows, once again, mixed evidence.

In the context of tourism-related firms, the literature that analyses the managerial compensation determinants is very sparse although Li and Singal (2022) claim that it constitutes 9,2% of papers dedicated to analyzing the corporate governance in the hospitality and tourism industry. In fact, these authors only find eleven articles focused on this topic in their recent literature review. Among them, we have found the works of Barber et al. (2007), Guillet et al. (2012), Kim and Gu (2005), Kim and Kim (2011), Madanoglu and Karadag (2008) and Ozdemir et al. (2013) analyzing the US restaurant industry; the paper of Gu and Choi (2004) focusing on the US casino industry; Al-Najjar (2017) that analyze UK travel and leisure firms; and Ozdemir and Upneja (2012), the only work focused on the managerial compensation determinants of hotel firms, specifically from the US industry.

All these papers use some measure of firms' financial return either as interest variable or as control variable, and their findings are inconclusive even in the same country and activity. While Gu and Choi (2004), Kim and Gu (2005) and Kim and Kim (2011), find no relationship, the others find a positive and significant relationship between CEO compensation and firms' financial return. But only Ozdemir et al. (2013) analyze the relationship between CEO compensation and firms' financial risk. In this paper the authors use as proxy of financial risk a market-based measure of firms' systematic risk.

They found that systematic risk induces a higher proportion of incentive-based CEO compensation without moderating the relationship between compensations and financial returns.

In the hotel activity context, Ozdemir and Upneja (2012) found no relationship between CEO compensation and board size, and a positive relationship between CEO compensation and proportion of the outside board members. These results are contrary to the evidence showed in the previous literature. The authors note that their findings suggest the existence of different determinants of CEO compensation across industries. In fact, the mixed evidence found in the previous literature about the relationship between CEO compensation and financial performance can be due, among other research design characteristics, to the amalgam of activities that cover sample firms. In this sense, disaggregated activity-specific findings are expected to be more useful since, as Li and Singal (2019) remark, this gap in the literature, and the consequent lack of robust evidence, retard progress for future knowledge.

Interestingly, no work is focused on the Eurozone market or any of its member states, even though the top two world tourist destinations (France and Spain), and three of the top five (if we add Italy), are found there. Tourism related firms in the Eurozone make a significant contribution to GDP and its growth through the creation of new consumption opportunities for tourists. Furthermore, they are an important source of employment and livelihood by carrying out a labor-intensive task. On the other hand, as recently Trinh and Seetaram (2022) point out, the evidence found in the US is conditioned by a higher deregulated context (Word Bank, 2020; Heritage Foundation, 2022), which calls into question whether the conclusions drawn from it are directly transferable to other markets. In fact, Zhou (1999) shows that, after controlling for the cultural and institutional effect on managerial salary schemes, cross-country differences in the intensity of regulation, labor law, and taxes condition the country-specific pay-performance relationship. This is also why country-specific analyses other than those of the US become relevant.

In this context, this paper focuses, for the first time to the best of our knowledge, on analyzing the effect of firm financial performance on the compensation of CEOs of listed European hotel firms. In turn, this work can be seen as the first robustness test of Ozdemir and Upneja (2012) evidence found for hotel firms in another regulatory context and another sample period. As proxies of firm's financial performance, we use both

accounting-based measures, ROA and ROE, and market-based measures, stock return and a bi-dimensional measure formed by stock return and risk.

To proxy firm's market-based risk we use the realized volatility of stock returns. Unlike Ozdemir et al. (2013), we additionally use the two components of firm's risk: the systematic risk and the idiosyncratic risk, which are simultaneously computed from a well-known asset pricing model. Therefore, we show evidence, also for the first time to the best of our knowledge, on the role of firm's systematic and idiosyncratic risk in determining CEO compensation in hotel firms. Moreover, we contribute to the tourism-related literature showing, as far as we know, evidence on the effect of firm's idiosyncratic risk on CEO compensation.

With respect to the methodology used in this paper, we highlight the following procedures: we conduct a pre-estimation analysis to optimally select the econometric technique applicable to our sample and a post-estimation analysis to rule out estimation problems; we rigorously select sample firms based on their main activity and the standards followed by global index providers; we statistically detect atypical values in our initial sample with a specific method for multivariate contexts; we alternatively use cash, equity and total CEO compensation as endogenous variables; and finally we conduct several robustness tests of results.

Our results show that financial performance of hotel firms proxied by both accounting- and market-based measures has not a significant effect on CEO compensation. When we use the return-risk bi-dimensional market-based measure, we find that, after controlling for its volatility, the stock return remains non-significant, and that return volatility has not a significant role in determining CEO compensation. A further analysis by decomposing total risk into its systematic and idiosyncratic components shows that idiosyncratic risk has a negative effect on CEO future compensation. Moreover, when we consider the interaction between return and risk variables, we find that stock returns become a statistically significant determinant of CEO cash compensations but with different sign depending on the level of idiosyncratic risk of the company.

The remainder of the paper is structured as follows. In the next section, we develop the research hypotheses, define variables and the proxies used in the analyses, show how we compute model-dependent exogenous variables and describe the econometric

empirical models as well as the procedures for their estimation. Section 3 shows how we design the sample and the main statistics of the data included in the analyses. In Section 4, we present the empirical results. Section 5 is dedicated to the robustness analyses. Finally, concluding remarks are provided in Section 6.

2. Methodology

2.1. Research hypotheses

To link compensation systems to firm profitability and stock performance to align the preferences of agents with those of the principal, as agency theory suggests, entails to transfer risk from the principal to the agent. This fact may encourage CEOs to protect themselves reducing risk against the interests of shareholders, who are supposed to be risk neutral since they can optimally manage their portfolios in the financial market. That is why when introducing firm risk as (an inseparable, regarding the financial theory) part of its financial performance, to base the agent's reward on outcomes may cause two effects of opposite sign (Singh, 1985).

Agency theorist have incorporated this issue in the core of the principal-agent theory and relate the efficiency of linking managers compensation to their behavior proxied by firm's financial performance to three main factors: (i) the elasticity of financial performance to the behavior of the CEO. When there is a low instrumentality in the financial performance of the company, linking the CEO's reward to it is a sterile measure that can become counterproductive (Amihud and Lev, 1981; Hoskinsson et al., 1989; and Baysinger et al., 1991); (ii) the availability of reading and cheaping information about CEO behavior. The more such information is available, the less appropriate it is to use financial performance as a surrogate of it (Eisenhardt, 1989); and (iii) the compensation that the CEO will demand for bearing the transferred risk. Depending on this amount, a cost-benefit analysis will report results that recommend to link CEO compensation to firm's financial performance to a greater or lesser extent (Holmstrom, 1987).

In this conceptual framework, the empirical literature has focused on examining the relationship between firm risk and the design of CEO compensation. This literature commonly uses as proxy of firm risk the realized variability of return measures used to surrogate the CEO behavior. Based on the three theoretical factors listed above, it is expected a decrease relation between equity CEO compensation and financial risk since

as the latter increases: (i) the instrumentality of CEOs effort becomes weaker; (ii) the financial performance become a wrong proxy of CEOs behavior; and (iii) the compensations that CEOs demand for transferred risk is higher (Beaty and Zajac, 1994).

Hypothesis 1. The Eurostoxx listed hotel firms' financial risk have a negative effect on the equity compensation of CEOs.

The empirical literature, echoing the developments on financial risk measurement in finance theory, has also considered the decomposition, based on asset-pricing models, of the firm's total risk into its two additive components: (i) the systematic risk, related to the dynamics of the whole market, due to the evolution of macroeconomic variables; and (ii) the idiosyncratic risk, caused by the unique dynamics of the company due to its own actions. When these orthogonal components are used instead the firm's total risk, there are several reasons to expect that the decreasing relation between equity CEO compensation and financial risk to be mostly supported by idiosyncratic risk (Gray and Cannella, 1997).

From the agency theory, due to: (i) the near non-existent return instrumentality in the case of systematic risk; (ii) the near non-existent informativeness of systematic risk about the CEO behavior; and (iii) the ever-high cost of compensating CEOs for bearing a risk that they can't manage; we can interpret that to transfer systematic risk is not an objective of the principal when design outcome-based CEO compensation.

Hypothesis 2. The idiosyncratic risk of the Eurostoxx listed hotel firms has a negative effect on the CEOs equity compensation stronger than their systematic risk.

Focusing now on the cash component of CEO compensation, we expect that contingent bonuses may cause a positive effect of firm returns on CEO cash compensation. On the contrary of the pay instruments included in the equity compensation component, bonuses only transfer partially firm risk. CEOs do not bear "bad" risk when add these instruments in their portfolios, they only bear the upside firm return risk. Moreover, bonuses are usually design as a premium on the constant higher base salary and have not only a positive expected value but a positive minimum expected value. Clearly, the intensity of the effect of firm returns on CEO cash compensation that bonuses cause depends on the relative importance of bonuses over total cash compensation.

But once again, this effect is not unrelated to the financial risk of companies. As the agency theory suggest, linking compensation to returns makes little sense in firms with a low risk, so no effect of financial return on compensations is expected in this case (Miller and Shamsie, 1996). On the other hand, pay instruments with upside-only risk are a good alternative to equity compensation in firms with higher risk. All this means that a non-linear effect of financial return on compensation is expected. From a level of risk in which to base CEO compensation on financial returns becomes rational, it is expected a higher effect on firms with higher risk.

Hypothesis 3. The financial return of the Eurostoxx listed hotel firms has an idiosyncratic risk level dependent non-linear effect on the CEOs cash compensation.

2.2. Variables

Three different measures of CEO compensation are considered depending on their nature: cash, equity derivatives, or both. CEO *cash* compensation is the sum of annual base salary and the gross bonus granted to the CEO during the financial year. CEO *equity* compensation is the sum of stock options, deferred bonuses and long-term incentive plans (LTIPs) granted to the CEO during the financial year valued according to the financial asset market price at award time. Finally, CEO *total* compensation includes the sum of both CEO cash compensation and CEO equity compensation earned in a year.

The differentiation between cash and equity compensation is crucial in the former analysis to the extent that cash compensation seeks to align CEO interests with short-term firm performance, while equity compensation aligns CEO interests with long-term firm performance, as Li and Singal (2019), among others, argue. The difference in the scope of these forms of compensation causes the relationships between them and their determinants to be not only different but also of the opposite sign and thus hiding each other when only total compensation is considered.

With respect to the variables that determine CEO compensation, we define first two variables related to firm characteristics shown by firms' balance sheet: their size (Gabaix et al., 2014) and their capital structure (Liu et al, 2020). We measure firm *size* by total assets at the end of the firm's prior fiscal year but in logarithmic form due to the nonlinearity observed in the previous literature in the relationship between size and CEO compensation. In fact, we assume that relative changes in firm size are linearly related to

CEO compensation. The other variable, firms' capital structure, is measured by *debt* ratio which is computed as the ratio of total debt to total assets at the end of the firm's prior fiscal year, and alternatively by financial *leverage*, computed as the ratio of total debt to equity at the end of the firm's prior fiscal year.

We also include four variables related to corporate governance mechanisms among the variables that determine CEO compensation. We proxy for the monitoring effectiveness of the board structure using the *outside* director variable (Finkelstein & Hambrick, 1989; Conyon & Peck, 1998; Core et al, 1999), defined as the percentage of outside directors on the board. We proxy CEO power (Mozes & Newman, 1999; Dey et al., 2011; Dowell et al. 2011) with the dichotomous variable *duality*, which takes the value 1 if the roles of chairman and CEO are performed by the same person and 0 otherwise. Furthermore, we also proxy for the influence of controlling shareholders through the *ownership* structure, which is measured as the aggregate percentage of shares owned by those shareholders who hold 5% or more of a firm's shares (van Essen et al., 2015). Finally, to account for institutional shareholder influence on the board of directors, we use the *institutional* shareholder variable (Croci et al., 2012; Fernandes et al., 2013), which is defined as the aggregate percentage of shares owned by those institutional shareholders who hold 5% or more of a firm's shares.

The last group of variables is related to our variable of interest: firm financial performance. As market-based measures of it, we use *stock return,* computed as the annual holding returns over the past fiscal year (Core et al., 1999), and a bi-dimensional measure that adds firm financial risk to stock return. From firms' weekly returns for the previous fiscal year, we compute the annualized standard deviation that we use as measure of firm financial risk, and we label it stock-return *volatility*. We also include in our analysis two accounting-based measures of firm financial performance usually use in the literature (Paul, 1992). Concretely, these measures are the return on assets, *ROA*, computed as the ratio of earnings before interest and taxes on total assets at the end of the firm's prior fiscal year; and the return on equity, *ROE*, computed as a firm's net return on equity at the end of the firm's prior fiscal year.

2.3. Computing financial-risk components exogenous variables

The bi-dimensional nature of financial performance alerts us to the need to either jointly consider both variables, return and risk, or alternatively use a synthetic indicator that contains the information of both variables as would be the case, for example, with a risk-

adjusted return. As we note above, we use jointly both the year-holding stock returns and the intra-year stock return volatility. This choice permits us a deeper analysis of the relationship between CEO compensation and firm financial risk through the usual decomposition of total financial risk into systematic and idiosyncratic risk (Jin, 2002).

However, firm's systematic and idiosyncratic risks are neither observable nor computed directly from primary data. Therefore, we make use of an asset-pricing model to compute the two components of firm financial risk. Concretely, we use one of the well-known factor pricing models: the four-factors model due to Fama, French and Carhart (FFC) also used in Ozdemir et al. (2013).

The most popular of the multifactor models was developed by Fama and French (1993). It is a three-factor model where factors are related to the market risk premium (as in the one-factor market model, the simplest in the factor models family), firm size and growth options. The three-factor Fama and French model are usually completed with the Carhart (1997) momentum factor, which measures the persistence of a firm's market returns, giving rise to the four-factor pricing model:

$$R_{i,t} - R_{f,t} = \beta_0 + \beta_{MKT,i} MKT_t + \beta_{SMB,i} SMB_t + \beta_{HML,i} HML_t + \beta_{MOM,i} MOM_t + \varepsilon_{i,t}; \quad (1)$$

where: $R_{it} - R_{f,t}$ is the stock excess return on risk-free rate for each firm in period *t*, *MKT* is the excess market return in period t, *SMB*, *HML*, and *MOM* stand for the firm size, growth options and momentum risk factor, respectively, and $\varepsilon_{i,t}$ is the error term with cero mean and variance σ_ε^2, orthogonal to the factors. The model variance equation from equation (1) is then:

$$Var(R_{i,t} - R_{f,t}) = Var(\sum_j \beta_{j,i} F_{j,t}) + Var(\varepsilon_{i,t}); \quad (2)$$

where: the residual variance, $Var(\varepsilon_{i,t})$, is computed from residuals in the estimated model of equation (1); total variance, $Var(R_{i,t} - R_{f,t})$ is directly computed from realized stock excess returns; and the variance explained by model factors in equation (1), $Var(\sum_j \beta_{j,i} F_{j,t})$, is computed from equation (2) by difference.

From the variance values we compute as their squared root the corresponding volatilities, which are in the same order of magnitude that returns, namely: the total firm risk, the systematic risk, explained by state factors; and idiosyncratic risk, not explained by state factors. Thus, using firms' weekly market returns data and weekly European

factors data,[1] we perform firm-year estimates of four-factors FFC model, which permit us to compute the estimated firm-year idiosyncratic risk (*SysRisk*) and the estimated firm-year systematic risk (*IdiosynRisk*).

2.4. Econometric model

As we have highlighted formerly, our main objective is to examine the financial performance effect on CEO compensation of hotel firms. To this end, we use a linear regression analysis where CEO compensation is regressed on firm characteristics that the previous literature sets as its potential predictors. Among the listed firm characteristics, the financial performance (*FP*) of hotel firm is our variable of interest. The others will play the role of control variables (*Controls*) to avoid specification problems due to omitted variables. The base econometric model we estimate is:

$$CEO\ Comp_t = Cte + \alpha_{Return} Return_{t-1} + \alpha_{Risk} Risk_{t-1} + \sum_c \alpha_c Controls_{c,t} + u_t; \quad (3)$$

Following Skalpe (2007) and Guillet et al. (2012), among many others, we use one-year lagged values of those characteristics related to financial data, setting the direction of the pay–performance relationship considered (Jensen and Murphy, 1990), and more realistically reflecting the non-simultaneity between pay and performance. As Guillet et al. (2012) point out, it is reasonable to assume that executives' performance should be evaluated to determine their compensation level.

To capture possible moderating effects of risk variables on the effect of financial return on CEO compensation and vice versa, we enlarge model in equation (3) by adding interaction terms of return and risk variables as in Ozdemir et al. (2013),

$$CEO\ Comp_t = Cte + \alpha_{Return} Return_{t-1} + \alpha_{Risk} Risk_{t-1} + \alpha_{int} Return_{t-1} \cdot Risk_{t-1} + \\ + \Sigma_c \alpha_c Controls_{c,t} + u_t; \quad (4)$$

To select the most adequate model estimation technique, we conduct a pre-estimation analysis of data described in the next Section. First, following Torres-Reyna (2007), we use the Hausman test to choose between a random- and a fixed-effects panel

[1] Computed from daily European factors provided by the Kenneth French data library: http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

data model and the latter is rejected by accepting the null hypothesis that unique errors are not correlated with the explanatory variables. Then, we conduct the Breusch-Pagan Lagrange-multiplier test to choose between random effects and OLS regression. The null hypothesis of the LM test is that variances across firms are non-significant. The LM test failed to reject the null, so there is no evidence of significant differences across sample firms. We conclude that there is no panel effect in the sample, and we run OLS pooled regressions on our unbalanced panel. However, slope coefficients p-values are calculated using cluster-adjusted standard errors at firm date-level to account for an unobserved firm and time effects (Petersen, 2009).[2] The adjusted determination coefficients are also reported along with the significance of the F-statistics to validate the models.

We also conduct a post-estimation analysis to check for multicollinearity problems. Concretely, we compute the variance inflation factors (VIFs) for the independent variables in our model. In all cases, the VIF values computed for our variables of interest are less than 1.80, hence we rule out that our conclusions are biased by the effects of multicollinearity.

3. Sample design and data

The mandate to prepare financial statements using IFRS for companies listed in the European Union stock markets limits the start of our sample period to January 2005. Among others, Fullana et al. (2021) note that empirical evidence suggests a high degree of heterogeneity between the local GAAP of European countries, in this sense the joint use of financial information from firms located in different countries prior to 2005 is not recommended. Therefore, our sample period ranges from January 2005 until the last fiscal year ended before January 2020.

As we highlight previously, we are particularly interested in providing evidence on the role of financial performance in determining compensation of CEOs in the European hotel firms. To this end, we focus on the more important European hotel firms where we expect more pronounced agency problems and therefore where CEO

[2] We appreciate this observation from an anonymous reviewer for *International Journal of Hospitality Management*.

compensation policies become more relevant.[3] With this framework, we intend to find sharper evidence of the relationship addressed.

Consequently, we search European hotel firms among listed firms that at any time during our sample period have been components of the *STOXX Europe Total Market Index* and, more concretely, of the sector index *STOXX Europe Total Market Travel & Leisure*.[4] We also require that the sample firms are categorized by *STOXX* in the *Hotels and Motels* ICB-Subsector according to their primary source of revenue.[5] Only a total of ten companies meet the pre-set requirements.

We are aware of the existence of important European companies that are excluded from our selection of sample firms and that carry out important hotel activity even though it is not their main activity, as the TUI Group is, and the Thomas Cook Group was. In our opinion, the inclusion of these companies in our sample can bring on an undesirable bias in the results and, concomitantly, distort our conclusions. Therefore, by including only the purest hotel players in the sample, we intend to show evidence more directly related to hotel activity.

In Table 1, the main financial (in Panel A) and operational (in Panel B) indicators provide a current picture of the sample firms, including their headquarters locations (Panel A). The sample firms, which are classified by *STOXX* in the context of the *Europe Total Market Index* as mid- and small-cap firms, as usual in the *Travel & Leisure* sector, are the most important in the *Hotels and Motels* ICB-Subsector, with a market value between 398 and 7,494 million euros. The sample firms offer a reliable representation of

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3 As Guilding (2003) state it was widely recognized that firms in the hospitality industry tend to have agency related problems stemming from ownership styles.

4 "The STOXX Europe Total Market Index (TMI) represents the Western Europe region. With a variable number of components, it covers approximately 95 percent of free-float market capitalization across 17 European countries: Austria, Belgium, Poland, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom."

5 "STOXX Ltd. is a global index provider, currently calculating a global, comprehensive index family of over 10,000 strictly rules-based and transparent indexes." "The Industry Classification Benchmark groups companies that have similar primary revenue sources. Currently, there are ten industries, and derived from these – in increasingly finer classifications – there are 19 super-sectors, 41 sectors and 114 subsectors. Each stock in the investable stock universe is uniquely classified, based on the company's primary revenue source, in one of the 114 subsectors. Consequently, it is automatically and uniquely classified into one of the 41 sectors, one of the 19 super-sectors and one of the ten industries."

European companies whose main activities are in the hotel industry, possessing a range of room availability between 5,900 and 640,000.

In this sense, Borko (2019), in his research report on the European Union accommodation sector, includes fourteen large, publicly traded hotel companies. However, only seven of them have their headquarters located in Europe. These seven firms are included in our sample. Similarly, Whyte (2019) analyses CEO compensation in 2018 using data from eighteen listed European firms with travel and accommodation activity and a market capitalization of more than $1 milliard. In this case, only five of them have hotel activity as their primary source of revenue. Again, our sample includes these five companies. Recently, Jareño et al. (2021) analyze the stock returns of main European service and tourism companies and use a sample of twelve companies of the *STOXX Europe Total Market Travel & Leisure* index of which only one has lodging as its main activity and is also in our sample. In an international context, the only work focused on the managerial compensation determinants of hotel firms, Ozdemir and Upneja (2012), use in their analysis of the US hotel listed firms a sample of sixty-four observations from twelve hotel firms.

From the websites of sample firms, we obtain their corresponding annual remuneration reports and annual corporate governance reports from 2005 to 2019. From these reports, we extract data about CEO compensation, corporate governance structures and ownership.[6] One-year lagged primary financial data of firms, used to compute firms' balance sheet characteristics and accounting-based financial performance measures, are obtained from firms' financial statements from 2005 to 2019 that are included in the Orbis database.[7] Finally, weekly stock returns from 2004 to 2019 were used to compute the one-

[6] The two databases commonly used in work on executive compensation are BoardEx (Global Market Exchange includes European market) and Compustat ExecuComp (US market). We have checked BoardEx and it only had CEO compensation data for 2 European hotel companies.

[7] "Orbis is the world's most powerful comparable data resource on private companies" provided by Bureau Van Dijk, a Moody's Analytics Company. IFRS adapted 2004 financial statements are mandatory in 2005 financial statements to ease a proper horizontal financial analysis.

year lagged market-based financial performance measures; these data are obtained from the EUROFIDAI database.[8]

We obtain unbalanced panel data for 10 firms along 15 years that include 124 distributed firm-year observations. All data in monetary units have been conveniently transformed to euros of 2004 using year-end exchange rates and country-specific consumer price indexes. We have chosen not to delete the observations corresponding to the financial crisis years neither the observations around years in which sample companies have been involved in corporate operations.

These qualitative criteria delete too many observations (at least in relative terms) and do not assure us that they are all outliers or that all atypical values have been removed. To the 124 observations, we alternatively applied a statistical method of detection of atypical values in the multivariate analysis environment. Concretely, we have used the minimum covariance determinant method developed by Verardi and Dehon (2010) and have removed fifty-three observations, many of them included in the crisis years or from sample firms involved in corporate operations, but not all.[9]

Table 2 shows the main statistics of the 71 observations that conform our unbalanced panel without outliers. We can see (Panel A) how cash compensation is more frequent than equity compensation, although when the latter occurs it reaches greater levels than the former.[10] We can also see in Panel A of Table 1 that total compensation shows a high dispersion among our sample firms and draws a distribution function asymmetrically biased to the right and thus concentrating the mass of the distribution in values below their mean. Cash and equity compensation components follow the same pattern, although both high dispersion and positive asymmetry are more pronounced in equity compensation. Despite the small number of sample companies, we can see that our sample observations show high variability in terms of CEO compensation.

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[8] "EUROFIDAI is a public academic institute funded by the CNRS (French National Center for Scientific Research), the largest research institute in France. Its main mission is to develop financial databases useful to academic researchers in finance."

[9] We use the Verardi and Croux (2009) fast algorithm of this estimator programmed in Stata, the *mcd* command, with default values of the optional parameters.

[10] When no equity compensation is paid, we use a technical value very close to zero that permits us to obtain a numerical value despite its logarithmic definition and not miss these observations.

Table 1. Hotel firms listed in the STOXX® Europe Total Market Travel & Leisure

A. Financial Indicators

Firms	Country	Turnover	Cap	MtB	PER
Accor	France	4,439	5,723	1.62	35.67
Dalata HG	Ireland	435	565	0.91	30.32
Intercontinental HG	England	4,178	7,494	-8.49	18.07
Melia HI	Spain	1,815	806	1.40	23.63
Millennium & CH	England	1,141	2,471	0.64	15.82
NH HG	Spain	1,734	1,177	1.44	58.54
Orbis Hotel	Poland	290	1,060	1.93	11.10
Radisson Hosp. AB	Sweden	988	720	2.76	19.66
Scandic HG	Sweden	1,806	398	1.03	29.6
Skistar AB	Sweden	246	606	3.33	15.20

B. Operational Indicators

Firms	Rooms	Employees	ARR	RevPar	Occup.
Accor	531,000	19,254	92	64	69.3%
Dalata HG	8,746	3,530	124.2	107.41	86.5%
Intercontinental HG	640,000	9,636	182	134	73.5%
Melia HI	99,162	45,717	109	70	65.2%
Millennium & CH	40,323	11,504	99.33	72.79	73.3%
NH HG	50,444	11,823	103	74	71.7%
Orbis Hotel	14,000	3,974	58.2	45.66	73.0%
Radisson Hosp. AB	84,842	4,248	106.5	73.6	69%
Scandic HG	42,000	18,907	102.62	67.74	66%
Skistar AB	5,900	1,322	n/a	n/a	82%

Turnover: in millions of euros; **Cap**: is the capitalization in millions of euros; **MtB:** is the ratio market to book; **PER**: is the ratio price /earnings per share 10 year-average; **Rooms**: number of rooms available in each firm; **Employees**: in miles; **ARR**: average room rate in euros. **RevPAR**: revenue per available room in euros; **Occup**: is the hotel occupancy. The accounting individual information from the above firms is taken from their 2019 Annual Reports that is available in Orbis database. All firms are listed in STOXX® Europe Total Market Travel & Leisure index, 59 in totals, namely, 10 in the subsector *Hotels* code 5753, during the period from 2008 to 2019.

Table 2. Descriptive statistics

A. Executive compensation

	mean	sd	min	p25	p50	p75	max
Total	2124.08	2466.79	31.80	85.24	1373.56	3767.87	11085.83
Cash	1138.24	1125.91	23.87	85.19	968.88	1937.16	4063.80
Equity	985.84	1600.44	0.05	1.01	279.50	1488.52	8342.57

B. Determinants of executive compensation

	mean	sd	min	p25	p50	p75	max
Size	0.1444	0.0120	0.1194	0.1324	0.1459	0.1520	0.1651
Debt	0.4952	0.2122	0.0595	0.3303	0.5117	0.6072	1.0241
Leverage	1.0610	5.8895	-42.4459	0.4662	1.0237	1.5447	17.5449
Outside	0.5799	0.2173	0.2353	0.4167	0.5556	0.8000	0.9231
Duality	0.4507	0.5011	0.0000	0.0000	0.0000	1.0000	1.0000
Largest	0.4580	0.2347	0.0000	0.3000	0.4951	0.6263	0.9606
Institutional	0.1494	0.1126	0.0000	0.0610	0.1150	0.2400	0.3500
ROA	0.0759	0.0674	-0.0701	0.0413	0.0587	0.1132	0.4001
ROE	0.1440	0.8244	-5.0270	0.0336	0.0833	0.1529	3.8307
Stock return	0.1120	0.2894	-0.7504	-0.0418	0.1157	0.3336	0.6572
Volatility	0.2917	0.0916	0.1405	0.2254	0.2713	0.3456	0.5370
SysRisk	0.1201	0.0775	0.0162	0.0649	0.0921	0.1711	0.3619
IdiosynRisk	0.2562	0.0750	0.1361	0.2062	0.2422	0.2901	0.4783

Total, *cash* and *equity* compensations in thousands of euros. *Size*, *Debt*, *Leverage*, *ROA*, *ROE*, *Stock return and Volatility* lagged one period. Both Systematic Risk (*SysRisk*) and Idiosyncratic Risk (*IdiosynRisk*) are the components from 3-factors Fama–French model (1993) and Momentum Carhart Factor (1997)

Table 3. Correlations between variable proxies used in the analyses

	Total	*Cash*	*Equity*	*Size*	*Debt*	*Lev.*	*Out.*	*Dual*	*Larg.*	*Instit.*	*ROA*	*ROE*	*Stock return*	*Volat.*	*SysRisk*
Cash	.85*														
Equity	.70*	.36*													
Size	-.06	-.11	-.14												
Debt	.29*	.04	.53*	.23											
Leverage	.03	.03	.04	.03	.03										
Outside	.17	-.02	.49*	.24*	.61*	.04									
Duality	-.37*	-.11	-.67*	.66*	-.32*	-.01	-.16								
Largest	-.10	.25*	-.48*	-.42*	-.58*	-.02	-.54*	.24*							
Institutional	.17	.19	.05	.52*	-.13	.04	.05	.44*	-.09						
ROA	.20	.04	.24*	.02	.33*	-.09	-.02	-.24*	-.19	-.11					
ROE	.07	.01	.09	.04	.08	.90*	.03	-.07	-.08	.05	.25*				
Stock return	.12	.07	.06	-.03	.08	.06	-.04	-.09	-.06	-.01	.01	.04			
Volatility	-.17	-.07	-.20	.04	.01	.16	.16	.21	.24*	.14	-.28*	.05	-.30*		
SysRisk	-.04	-.02	.10	.21	.29*	.14	.45*	.14	-.07	.20	-.18	.04	-.37*	.76*	
IdiosynRisk	-.18	-.07	-.30*	-.08	-.13	.14	-.02	.17	.36*	.07	-.27*	.04	-.19	.92*	.47*

* Significant at 5%. *Size, Debt, Leverage, ROA, ROE, Stock return and Volatility* lagged one period. Both Systematic Risk (*SysRisk*) and Idiosyncratic Risk (*IdiosynRisk*) are the components from 3-factors Fama–French model (1993) and Momentum Carhart Factor (1997).

Regarding the proxies of the explanatory variables considered, we can see in Panel B of Table 2 that in 45% of the observations, there is a chair-CEO *duality* and that 58% of directors, on average, are *outside* directors. This finding is aligned with most of the European Good Government Codes, which recommend that more than half of the members of boards of directors should be outside directors. The *largest* stockholders own 46% of the total shares on average, while *institutional* shareholders own 15% of them on average.

The important dispersion reported for *leverage* shows the diverse capital structure of sample firms, highlighting that many of them have debt policies quite different from the rest. As expected, only accounting- and market-based return variables take negative values; with great differences between *ROE* and *stock return* distributions due to the important differences observed in the firm market-to-book ratios.

Table 3 shows the Pearson correlation coefficients between the variables used. A significant correlation is observed between the compensation measures that are used alternatively in the analysis as endogenous variables. Table 3 also shows significant correlations between these compensation measures and the *debt*, *outside*, *duality* and *largest* variables.

However, the *institutional* variable seems to be more correlated with the cash component of compensation, while the *ROA* and *ROE* variables are more correlated with the equity component. In addition to the *duality* variable, neither market-based return nor market-based risk are significantly correlated with compensation variables. In fact, *stock return* and *volatility* variables are significantly correlated only with each other. These findings show evidence that permits us to rule out multicollinearity, since correlations between the exogenous variables are well below 90% (Belsley, 1991).

4. Empirical results and discussion

In Table 4, 5 and 6, we show model estimations for CEO *Total* compensation, CEO *Cash* compensation and CEO *Equity* compensation, respectively. For each one of these dependent variables, we estimate four models alternating financial return and risk measures. In this sense we consider *Debt* and *Leverage* appropriate financial risk measures related to *ROA* and to *ROE* or *Stock return*, respectively. To avoid multicollinearity, we only use one measure of return and risk in each model.

Table 4. Model estimation for total compensation

	(1)	(2)	(3)	(4)
Size $_{t-1}$	25.318*	34.325**	34.297**	33.753**
	(0.093)	(0.029)	(0.026)	(0.040)
Debt $_{t-1}$	0.636			
	(0.382)			
Leverage $_{t-1}$		-0.003	-0.002	
		(0.862)	(0.384)	
Outside	0.100	0.305	0.329	0.574
	(0.905)	(0.721)	(0.705)	(0.497)
Duality	-1.208**	-1.413***	-1.402***	-1.366***
	(0.010)	(0.002)	(0.002)	(0.002)
Largest	1.362*	1.389	1.405	1.636*
	(0.068)	(0.122)	(0.115)	(0.083)
Institutional	2.488*	2.188	2.176	2.319
	(0.072)	(0.125)	(0.132)	(0.100)
ROA $_{t-1}$	0.556			
	(0.675)			
ROE $_{t-1}$		0.014		
		(0.930)		
Stock return $_{t-1}$			0.200	0.079
			(0.426)	(0.757)
Volatility $_{t-1}$				-1.502
				(0.164)
Constant	3.396	2.460	2.418	2.660
	(0.126)	(0.306)	(0.297)	(0.287)
F	5.434	4.985	5.125	5.741
	(0.000)	(0.000)	(0.000)	(0.000)
R2	0.376	0.374	0.379	0.414

*** Significant at 1%, ** Significant at 5%, * Significant at 10%. F: Value of the F statistic for (7,63) liberty grades for the numerator and for the denominator respectively; R2: Coefficient of determination; # Obs. 71.

Table 5. Model estimation for cash compensation

	(1)	(2)	(3)	(4)
Size $_{t-1}$	15.944	23.570*	22.745*	22.264*
	(0.149)	(0.062)	(0.070)	(0.084)
Debt $_{t-1}$	0.599			
	(0.257)			
Leverage $_{t-1}$		0.011	-0.001	
		(0.265)	(0.886)	
Outside	0.131	0.332	0.374	0.629
	(0.857)	(0.642)	(0.608)	(0.351)
Duality	-0.710**	-0.885**	-0.851**	-0.815***
	(0.049)	(0.014)	(0.018)	(0.010)
Largest	1.841**	1.854**	1.868**	2.109**
	(0.020)	(0.037)	(0.033)	(0.021)
Institutional	2.040	1.802	1.780	1.931
	(0.108)	(0.205)	(0.209)	(0.161)
ROA $_{t-1}$	0.011			
	(0.990)			
ROE $_{t-1}$		-0.086		
		(0.345)		
Stock return $_{t-1}$			0.154	0.032
			(0.529)	(0.901)
Volatility $_{t-1}$				-1.548
				(0.174)
Constant	4.032**	3.221	3.279*	3.517*
	(0.040)	(0.116)	(0.098)	(0.094)
F	3.333	3.102	3.142	3.748
	(0.004)	(0.004)	(0.004)	(0.002)
R2	0.270	0.271	0.274	0.318

*** Significant at 1%, ** Significant at 5%, * Significant at 10%. F: Value of the F statistic for (7,63) liberty grades for the numerator and for the denominator respectively; R2: Coefficient of determination; # Obs. 71.

Table 6. Model estimation for equity compensation

	(1)	(2)	(3)	(4)
Size $_{t-1}$	0.491	0.783**	0.764*	0.746*
	(0.345)	(0.044)	(0.059)	(0.059)
Debt $_{t-1}$	0.019			
	(0.458)			
Leverage $_{t-1}$		0.000	-0.000	
		(0.630)	(0.792)	
Outside	0.036	0.042	0.042	0.051*
	(0.174)	(0.120)	(0.119)	(0.075)
Duality	-0.057***	-0.064***	-0.064***	-0.062***
	(0.003)	(0.001)	(0.001)	(0.001)
Largest	0.005	0.006	0.006	0.015
	(0.746)	(0.747)	(0.744)	(0.440)
Institutional	0.102*	0.093	0.093	0.098*
	(0.073)	(0.115)	(0.115)	(0.095)
ROA $_{t-1}$	0.016			
	(0.729)			
ROE $_{t-1}$		-0.002		
		(0.595)		
Stock return $_{t-1}$			-0.001	-0.005
			(0.880)	(0.284)
Volatility $_{t-1}$				-0.057
				(0.117)
Constant	-0.043	-0.074	-0.071	-0.063
	(0.576)	(0.273)	(0.293)	(0.340)
F	26.891	25.796	25.723	28.313
	(0.000)	(0.000)	(0.000)	(0.000)
R2	0.749	0.749	0.749	0.771

*** Significant at 1%, ** Significant at 5%, * Significant at 10%. F: Value of the F statistic for (7,63) liberty grades for the numerator and for the denominator respectively; R2: Coefficient of determination; N: observations. # Obs. 71.

Table 7. Marginal effect and decomposing risk on CEO compensation

	(1) *Total*	(2) *Cash*	(3) *Equity*	(4) *Total*	(5) *Cash*	(6) *Equity*
Size $_{t-1}$	33.741**	22.252	0.746*	35.846*	23.428*	0.681
	(0.049)	(0.107)	(0.070)	(0.051)	(0.091)	(0.119)
Outside	0.551	0.607	0.051*	0.458	0.422	0.039
	(0.512)	(0.371)	(0.075)	(0.642)	(0.600)	(0.152)
Duality	-1.414***	-0.860***	-0.063***	-1.486***	-0.924***	-0.063***
	(0.001)	(0.009)	(0.001)	(0.001)	(0.007)	(0.001)
Largest	1.667*	2.138**	0.015	1.781*	2.252**	0.017
	(0.090)	(0.023)	(0.433)	(0.071)	(0.016)	(0.387)
Institutional	2.573*	2.169	0.101*	2.592*	2.181	0.101*
	(0.072)	(0.121)	(0.090)	(0.066)	(0.117)	(0.075)
Stock Return $_{t-1}$	-1.116	-1.088	-0.018	-1.602**	-1.599***	-0.030*
	(0.125)	(0.111)	(0.329)	(0.016)	(0.010)	(0.062)
Volatility $_{t-1}$	-1.725*	-1.756	-0.059			
	(0.099)	(0.118)	(0.110)			
Return Volatility*	3.470	3.249	0.038			
	(0.105)	(0.134)	(0.388)			
SysRisk $_{t-1}$				-0.364	0.265	0.051
				(0.830)	(0.858)	(0.257)
*Return * SysRisk*				-0.806	-0.426	0.038
				(0.604)	(0.809)	(0.470)
IdiosynRisk $_{t-1}$				-2.191	-2.678	-0.113**
				(0.212)	(0.127)	(0.049)
*Return * IdiosynRisk*				6.240***	5.992***	0.081**
				(0.002)	(0.006)	(0.020)
Constant	2.757	3.608	-0.061	2.580	3.656	-0.040
	(0.297)	(0.110)	(0.363)	(0.376)	(0.121)	(0.586)
F	5.383	3.582	24.533	4.475	3.147	21.087
R2	0.410	0.316	0.760	0.427	0.344	0.778

*** Significant at 1%, ** Significant at 5%, * Significant at 10%. F: Value of the F statistic for (8,62) in models (1)-(3) and (10,60) liberty grades for the numerator and for the denominator respectively; R2: Coefficient of determination; Both Systematic and Idiosyncratic risk are the components from 3-factors Fama–French model (1993) and Momentum Carhart Factor (1997). *Return*Volatility* is the interaction terms between *Stock returns* and *Volatility. Return*SysRisk* and *Return*IdiosynRisk* are the interaction terms between the *Stock Return* and the risk components from 3-factors Fama-French model and Momentum Carhart factor. # Obs. 71

For total CEO compensation, Table 4 shows that the *Size* and *Duality* exogenous variables are significant in all models. *Largest* and *Institutional* are weakly significant in some models. And *Debt* or *Leverage* and *Outside* remain non-significant in the four models estimated. Financial performance is non-significant regardless the proxy used. When we move to the components of total CEO compensation, we see in Table 5 that for the cash component *Largest* gains significance in exchange that *Size* loses it. Beyond that, we only observe, through the significance of the constants and the joint statistics, that the models used explain the *Cash* component worse than the *Total* compensation. In Table 6, results related to CEO *Equity* compensation show that *Largest* becomes non-significant in any model. The slope coefficients of financial performance proxies remain non-significant. This result is in line with the results of Core et al. (1999) in the US context when they use accounting-based performance measures, with Jensen and Murphy (1990) and Kerr and Bettis (1987) that use market returns, and with the evidence shown by Kim and Gu (2005) for the US restaurant industry.

Results in Table 4, 5 and 6 show a non-significant effect with negative sign of firm risk on CEO compensation as in Mehran (1995), Core et al. (1999) and Conyon and He (2010). Note that, as expected, the explanatory power of the models notably increases when CEO equity compensation is analyzed. This fact shows that cash compensation incorporates a base compensation that is independent of firm characteristics. This base compensation may relate more to the labor market for managers and to CEO personal and career characteristics, which is information not available for this work.

In Table 7, we show the result of estimations of alternative models that incorporate both the decomposition of market-based firm risk into its *SysRisk* and *IdiosynRisk* components, and the interaction between *Stock return* and market-based firm risk measures. When we add the interaction between *Stock return* and *Volatility* in models (1), (2) and (3) for *Total*, *Cash* and *Equity* compensations respectively, an important gain in both *Stock return* and *Volatility* significance is observed, with significances of *Volatility* around 10%. This points to an underlaying dependence of the intensity of the effect of financial performance on CEO compensation on the firm risk level.

In fact, when we move to models (4), (5) and (6) where firm risk is decomposed, we find very interesting results in line with our arguments, namely: (i) the slope coefficients of *Stock return* become significant but more in the *Cash* component model than in the *Equity* one; (ii) the slope coefficients of *SysRisk* and the interaction between

Stock return and *SysRisk* are not significant in any model, as expected; (iii) in the *Equity* component model, the slope coefficient of *IdiosynRisk* is significant; and (iv) in all three models, the slope coefficient of the interaction between *Stock return* and *IdiosynRisk* is significant, showing now clearly that a dependence of the intensity of the effect of financial performance on CEO compensation on the idiosyncratic firm risk level exits.

A finer analysis of these results needs to compute the sensibility of CEO compensation to changes in *Stock return* and *IdiosynRisk* exogenous variables since now this sensibility is not directly reported by the slope coefficients of such variables. The sensitivity of CEO *Equity* compensation to changes in *IdiosynRisk* is now measured by its linear association with lagged *Stock return*, since:

$$\Delta\ Equity_t = (\beta_1 + \beta_2 \cdot Stock\ return_{t-1}) \cdot \Delta\ IdiosynRisk_{t-1}\ ; \qquad (5)$$

where: β_1 is the slope coefficient of *IdiosynRisk* and β_2 is the slope coefficient of *Stock return***IdiosynRisk* interaction variable in model (6) of Table 7.

We compute *IdiosynRisk* elasticities of CEO *Equity* compensation using Table 2 data. These computed elasticities show that for any *Stock return* level this elasticity is negative, as we expected. This result confirms our Hypothesis 1 in the sense of that Eurostoxx listed hotel firms' financial risk have a negative effect on the CEO equity compensation. In addition, this result also completes the evidence in favor of our Hypothesis 2 since the *SysRisk* of the Eurostoxx listed hotel firms has a non-significant effect on the CEO equity compensation.

Following this approach, we compute *Stock return* elasticities of CEO *Cash* compensation. In this case, the sensitivities computed show that *Stock return* has a positive effect on CEO *Cash* compensation since values of *IdiosynRisk* of 0.27 (its median value aprox.). These results support our Hypothesis 3 as the stock return of the Eurostoxx listed hotel firms has an effect on CEO cash compensation that depends on the level of *IdiosynRisk.* Moreover, as we expect, this effect is positive from an *IdiosynRisk* level.

As this work can be seen as the first robustness test of Ozdemir and Upneja (2012) evidence found for hotel firms in another regulatory context and another sample period, we intentionally report parameter estimations of our control variables. We find evidence in the Eurostoxx listed hotel firms that supports the mixed evidence about the effect of the proportion of outside board members on the CEO compensation when misspecified models are used. In models (4), (5) and (6) of the Table 7, *Outside* is non-significant.

However, we found different significant relationships between other control variables and the different types of CEO compensation in these models. This evidence may explain the mixed results in the previous literature in which only total CEO compensation is analyzed, overshadowing significant relationships in its components (Finkelstein and Hambrick, 1989).

Concretely, the cash component of CEO compensation is more related to firms' size and the level of ownership concentration, while the weight of institutional owners becomes more significant in the equity component analysis, as in David et al. (1998) and Croci et al. (2012). In contrast, the jointly role of chairman and CEO remains negative and significant for all types of CEO compensation and all models estimated. However, this evidence is also compatible with an increase in the sum of CEO and board chair compensation, which is not analyzed in this work.

5. Robustness analyses

5.1. Interaction between return and risk accounting-based exogenous variables

We estimate the models (1), (2) and (3) in Table 8, using accounting-based measures of both financial return and risk. We use *ROA* and *ROE* variables to proxy financial return, and *Debt* and *Leverage* to proxy their respectively risk. Results in Table 4, 5 and 6 do not change for *ROE* and *Leverage*, but for *ROA* and *Debt* the interaction variable *ROA*Debt* is negative and significant in line with results in Table 7 for *Stock returns* and *Volatility*. Concretely, estimations show that *ROA* has a positive effect on all compensation measures except for high values of *Debt* ratio. And *Debt* has a negative effect on all compensation measures when *ROA* is high, and positive when it is low. This result can help to interpret the findings in Mehran (1992), Ortiz-Molina (2007) and Liu et al. (2020).

Table 8. Accounting risk measures and marginal effects

	(1) Total	(2) Total	(3) Cash	(4) Cash	(5) Equity	(6) Equity
Size $_{t-1}$	22.385*	36.729**	13.358	25.834**	0.377	0.908**
	(0.066)	(0.018)	(0.106)	(0.040)	(0.352)	(0.017)
Debt $_{t-1}$	1.415		1.285*		0.050	
	(0.107)		(0.086)		(0.134)	
Leverage $_{t-1}$		-0.023		-0.008		-0.001
		(0.290)		(0.710)		(0.318)
Outside	0.091	0.300	0.122	0.327	0.036	0.041
	(0.913)	(0.731)	(0.866)	(0.652)	(0.168)	(0.128)
Duality	-1.184***	-1.473***	-0.688**	-0.941**	-0.056***	-0.067***
	(0.006)	(0.002)	(0.041)	(0.015)	(0.004)	(0.000)
Largest	1.192*	1.362	1.691**	1.828**	-0.001	0.004
	(0.075)	(0.149)	(0.020)	(0.047)	(0.929)	(0.818)
Institutional	2.830**	2.153	2.342*	1.769	0.115**	0.091
	(0.033)	(0.128)	(0.063)	(0.209)	(0.043)	(0.122)
ROA $_{t-1}$	7.695*		6.303*		0.295**	
	(0.069)		(0.063)		(0.045)	
*ROA * Debt*	-10.183**		-8.975**		-0.397**	
	(0.046)		(0.048)		(0.034)	
ROE $_{t-1}$		0.063		-0.040		0.000
		(0.676)		(0.697)		(0.945)
*ROE * Leverage*		-0.004		-0.004		-0.001*
		(0.294)		(0.367)		(0.085)
Constant	3.345*	2.192	3.987**	2.969	-0.045	-0.088
	(0.052)	(0.353)	(0.011)	(0.145)	(0.455)	(0.187)
F	5.766	4.396	3.618	2.756	28.293	23.045
	(8,62)	(8,62)	(8,62)	(8,62)	(8,62)	(8,62)
	(0.000)	(0.000)	(0.002)	(0.011)	(0.000)	(0.000)
R2	0.427	0.362	0.318	0.262	0.785	0.748

*** Significant at 1%, ** Significant at 5%, * Significant at 10%. F: Value of the F statistic, in bracket liberty grades for the numerator and for the denominator respectively; R2: Coefficient of determination; *Debt* is equal to Total Debt over Assets. *Leverage* is equal Total Debt over Equity. *ROA * Debt* and *ROE * Leverage* are the interaction terms between the *ROA, Debt, ROE and Leverage* respectively. # Obs. 71

5.2. Measuring financial market-based risk with variance

As usual, we use *Volatility* to measure firm risk based on financial returns data. We check whether transforming variances into volatilities have an impact on results by re-estimating all the models in which volatilities are involved using the variances from which they come. All results remain unchanged both qualitatively (signs and significances) and quantitative as the orders of magnitude of the slope coefficients are about the square root of the showed.

5.3. Measuring equity compensation as pay mix

Following Miller et al. (2002) and Ozdemir et al. (2013) among others, we also use *equity* compensation measure in relative terms. We compute a pay mix ratio as *equity* compensation on *total* compensation and re-estimate all the models where *equity* is the dependent variable. And again, all our results remain unchanged.

5.4. Avoiding econometric stationarity problems in the dependent variables

To use dependent variables in levels, while the interest variables are rates, may cause stationarity problems in regression estimates. To check it, we use alternatively to dependent variables in levels their difference with respect their unconditional mean and re-estimate all the models. Results show an absence of this problem in our regressions.

5.5. Alternative outlier detection procedures in a multivariate context

In small samples and multivariate context, the detection of outliers becomes a sensitive issue. Different techniques lead to different final samples, and this can alter the results when the sample is small. So, we check the influence of the outliers' detection technique used by applying alternatively three different identification techniques, two robust and another non-robust. Concretely, as robust techniques, we apply the Mahalanobis Distance and the S-multivariate estimator that corrects it, and Cook's Distance as non-robust. Results confirm that the final sample change depending on the technique used but model estimation qualitative results remain unchanged.

5.6. Model dependent exogenous variables

Market based financial risk decomposition requires to use an asset pricing model that implicitly define systematic risk as the part of total risk explained by state variables include in model and the idiosyncratic as the residual risk. Therefore, while total return realized volatility is observable, its decomposition is model dependent. To check the

influence of the four-factors FFC model used on the results we apply alternatively four different factor models, including two with less factors a two with more factors. Concretely, we apply the single-factor model or market model (Sharpe, 1963); the Fama and French three-factor model (Fama and French, 1993); the Fama and French five-factor model (Fama and French, 2015); and a six-factor model that nests the Fama and French five-factor model and adds the Carhart factor of momentum (Carhart, 1997). The re-estimations of models when the decomposition of total risk is used show that results are robust to the five financial asset-pricing models used to compute it.

5.7. Deleting observations with negative book value

The presence of negative accounting values does not represent any type of methodological or technical problem in our research, since the firm that has them enjoys a good financial health, of course, nothing like a bankruptcy, and we do not use the book value in logarithmic measures. However, given the a priori rejection that negative book values cause in the empirical literature, we have eliminated the three observations of Intercontinental HG and re-estimated all the models. Results remains unchanged.

6. Conclusions

In this work, we check whether there is an effect of firm financial performance on the compensation of CEOs of Eurostoxx listed hotel firms that align their preferences with those of the shareholders as agency theory suggest. To do it, we use both accounting-based and market-based measures of return and risk. We introduce firm's risk proxied by the realized volatility of stock returns. When we regress CEO total, cash, and equity compensation on return and risk variables, we find that, both stock return and volatility have a non-significant role in determining CEO compensation.

However, a further analysis using firm risk components and considering the interaction between financial return and financial risk shows us richer results. To do it, we compute the systematic and idiosyncratic component of realized volatility of stock returns using a well-known asset pricing model. Concretely, the results show that: (i) market-based firms' volatility has a negative effect on the CEO total compensation; (ii) the idiosyncratic component of firms' risk has a negative effect on the CEO equity compensation; (iii) firms' systematic risk has a non-significant effect on the CEO equity compensation; and (iv) firms' stock return has an effect on CEO cash compensation that

depends on the level of idiosyncratic risk, and it is positive from an idiosyncratic risk level. This evidence is robust to alternative proxies for systematic and idiosyncratic components of firms' market-based risk computed using four alternative factor asset-pricing models.

These results do not permit to reject any of the three hypotheses formulated based on the postulates of agency theory related to the link between managers' compensation and financial performance when the transfer of risk from the principal to the agent that this link entails is considered. That is, in the context of Eurostoxx listed hotel firms, as we hypothesize: CEO equity compensation is negatively influenced by firms' financial risk; this effect is mainly driven by the idiosyncratic component of the firms' risk; and financial returns have an influence on CEO cash compensation, and it is conditioned by the level of the firms' idiosyncratic risk. Therefore, we can conclude that the evidence shown supports the postulates of agency theory in the scope of our analysis: Eurostoxx listed hotel firms have remuneration schemes correctly designed to align CEO interests with those of the shareholders.

With all, this paper enlarges the scarce previous literature on the relationship between CEO compensation and stock performance in hotel, hospitality and tourism firms. However, our conclusions are specifically relevant for firms whose principal activity is hotel because we avoid, to the best of our ability, the bias to mix different tourism and leisure activities in the sample firms. This fact, led to obtain more robust results that provide more useful conclusions.

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