

Rui Augusto Costa / Jorge Mota

# Earnings Management in Hospitality Firms: Evidence From Portugal

## Abstract

This study examines whether Portuguese hotel sector firms engage in earnings management (EM) practices to provide specific accounting results and test the main determinants in explaining EM. We use the SABI database to collect panel data regarding 1615 Portuguese SME hotels from 2006–2013. In order to obtain results, a graphical representation of the distribution of the net income and the estimation of the discretionary accruals were used, from which two estimation models were formulated. The results obtained provide empirical evidence that firms in the Portuguese hotel sector seem to engage in earnings management practices and that the main determinants behind them appear to be debt level, return on assets, and firm size. The adoption of earnings management practices by firms is a widespread phenomenon across various sectors and nations. Yet, despite the general awareness regarding the importance of the tourism sector for communities at a financial, social, and cultural level, the lack of empirical studies with application to the accommodation sector makes it pertinent to investigate this phenomenon.

**Keywords:** earnings management, hospitality industry, Portuguese hotel sector, accruals, panel data

## 1. Introduction

The tourism sector is increasingly considered one of the main economic development engines in the world (Lopes et al., 2020), and even more so in the post-COVID-19 crisis, with this sector presenting one of the highest growth rates worldwide in 2019 (World Tourism Organization [UNWTO], 2019; World Travel & Tourism Council [WTTC], 2019). This sector represented 10.4% of the World's Gross Domestic Product (WTTC, 2019) which translates into a value of 1.7 trillion euros in global exports, generated by 1.4 billion international tourists (UNWTO, 2019).

Portugal is no exception in tourism sector trends. In the last few years, it has positioned itself as one of the reference destinations in Europe, with high growth rates in both the number of arrivals and revenue. This sector, considered to be strategically important to the growth of the Portuguese economy, represented 19.1% of GDP and 21.8% of employment in 2019 (WTTC, 2019). According to the WTTC (2019), the trend is for continued growth, with arrivals expected to reach 1.8 billion, representing 18.5% of GDP and 22.6% of employment in 2027.

The accommodation sector is assumed to be one of the major sub-sectors of tourism and is considered the basis for developing any destination (Baptista, 1990; Keller et al., 2000). However, it presents a set of characteristics and specificities that focus mainly on the issues of seasonality and perishability in their different classifications and forms of organization. Considering the importance of tourism to the Portuguese economy and the accommodation sub-sector in particular, it is essential to ascertain and understand firms' economic and financial situation in this sector (Pacheco, 2016). Moreover, the seasonality effect continues to be the

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sector's biggest challenge since it causes a great impact on the financial performance of firms operating in the tourism sector, especially in the accommodation sector.

One of the information sources of the economic activity of a firm is its financial statements. Through this information source, all the stakeholders are able to know the current economic and financial situation of a certain firm and make predictions about future results. The preparation of these statements must be an accurate representation of the current and real situation of the firms. Therefore all managers must discern the acceptable accounting limits when making decisions.

The reported financial information is often the basis of the decisions taken by stakeholders. Any distortion of this information can have serious consequences in the future since it can elude the perception of any interested stakeholder. In this context, the concept of earnings management emerges as flexibility existing in accounting principles, offering managers the possibility of making choices that reproduce the information in a way that is consistent with their needs and objectives.

This concept has attracted significant attention in the international academic community, both from theoretical and empirical points of view. The main contributions to the subject were given by previous research, e.g., Healy (1985), Jones (1991), Dechow et al. (1995), Burgstahler and Dichev (1997), and Coppens and Peek (2005).

However, these studies have focused mainly on industries other than tourism, as exemplified by the studies of Coppens and Peek (2005) for private firms in continental Europe; Gim et al. (2019) and Upneja et al. (2008) for restaurant firms in the United States of America; Tan (2011) for hospitals in Taiwan; and Esteban and Devesa (2011a) for the Spanish hotel sector. Additionally, despite the general awareness regarding the importance of the tourism sector for communities at a financial, social, and cultural level, the literature is poorly developed at the level of micro-entities. Performing a systematic literature review, Paiva et al. (2016) documented that "additional research is required for the small hotel category, and it is important to use comparative studies that are better able to capture the characteristics of the hospitality industry".

The specific characteristics of the hotel sector strongly influence its financial behavior. The literature suggests that the intensive nature of the capital invested in this sector promotes increased risk for its survival due to the high volatility of the revenues caused by seasonality and higher fixed costs, which do not change according to the variation in revenues (Elgonemy, 2002; Serrasqueiro & Nunes, 2014). The uncertainty around the demand that exists in this sector and the consequent operational activity risk contributes to an increase in the propensity of these firms to engage in earnings management to meet the expectations of their investors.

With the tourism sector being of great importance for the stability of a country's economic growth and with even higher significance in the specific case of Portugal, the importance of reliable financial reporting is even greater. Financial reporting in the hotel sector is important for all stakeholders but with relevance to political/public decision-makers because of the importance that this sector has in GDP.

Therefore, this framework includes a segment of the tourism sector with great importance for the country's economic development, as is the case for the accommodation sector for Portugal. It is also affected by issues of seasonality and perishability with potential distortionary effects on the reported financial information. Thus this research aims to study earnings management (EM) practice in Portuguese hotel sector firms in the years affected by the 2008-2011 financial crisis, which made the use of earnings management even more relevant. It also aims to clarify the main determinants that drive EM and its possible consequences, filling existing literature gaps.

Considering these arguments, it is important to ascertain whether hotels are motivated to manage their earnings to improve the results. The following methodologies were used to study this subject: examining the distribution of net income scaled by lagged total assets, as suggested by Burgstahler and Dichev (1997), to

determine whether there were discontinuities in the results presented close to zero (this fact was confirmed after the construction of the histograms and the resulting statistical Z-test); and, in addition to the graphical analysis performed, the estimation of the discretionary accruals using the methodology proposed by Jones (1991), as well as the estimation using panel-corrected standard error (PCSE) estimators to strengthen the results against the problems of heteroscedasticity, cross-section dependence, and autocorrelation, to assess the main determinants of EM.

We chose the Portuguese hotel sector for the following reasons: Portugal is a 'laboratory' of SMEs (small and medium enterprises). They are responsible for 99.9% of the business activity performed in Portugal, employ 80.2% of the workforce, and account for 59.3% of the total sales of the Portuguese industry (Instituto Nacional de Estatística [INE], 2016). In Portugal, hotels represent around 30% of the number of firms registered in the accommodation sector, and SMEs represent 99.7% of firms in the hotel sector (INE, 2016). Additionally, the great majority of Portuguese hotels are non-traded firms.

We used the Iberian Balance Sheet Analysis System (SABI) database to collect data regarding 1,615 Portuguese SME hotels from 2006–2013. The empirical evidence obtained in this study allows us to conclude that firms in the Portuguese hotel sector seem to engage in earnings management practices and that the main determinants behind them appear to be debt level, return on assets, and firm size.

This research contributes to the literature by studying the Portuguese hotel industry, a highly important segment of the tourism sector and the Portuguese economy, in the specific context of the financial crisis, which implies a potentially greater emergence of earnings management practices.

For researchers and practitioners, the findings of this study shed some light on the existence of earnings management practices in the hotel industry and their main determinants, such as firm size, performance, and leveraging.

This study is structured as follows. In the next section, we provide an overview of the theoretical framework and develop testable hypotheses. We present the sample and describe the research methodology in the third section. The data description and empirical results are reported and discussed in the fourth section. The final section presents the conclusions and implications of the study.

## 2. Theoretical framework and hypotheses

### 2.1. Earnings management: Theoretical conceptualization

In today's business world, many managers use creative accounting. This concept can assume many forms, and it can be found in the literature under various denominations: earnings management, income smoothing, big bath accounting, or in more extreme cases, accounting fraud.

The concept of earnings management covers a wide range of accounting techniques used by managers that aim to achieve a particular financial result. According to the literature, there is no universally accepted definition, which can be explained by the complexity and difficulty of measuring the term. This idea is reinforced by Beneish (2001), who states that "there is no consensus" on what, in fact, earnings management is.

However, two definitions of earnings management have excelled in the literature. The first, proposed by Schipper (1989), characterizes earnings management as a deliberate intervention in the process of reporting financial information with the intention of obtaining private gains. For Healy and Wahlen (1999), earnings management practices occur when managers use judgment to manipulate financial results in order to "mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers" (Healy & Wahlen, 1999, p. 368).

Beneish (2001) refers to the existence of two different perspectives on earnings management – the informative and the opportunistic. The first argues that these practices are intended to report the firm's future cash flows expectations to investors. On the other hand, the opportunistic perspective involves the manipulation of results by managers in order to mislead investors (Healy & Wahlen, 1999; Schipper, 1989). Beneish (2001) also believes that in terms of literature, the focus has only been placed on the opportunistic perspective and its conclusions, while the informative perspective has not been studied.

In general, it is assumed that the practices of earnings management imply a reduction of the transparency and clarity of financial statements. However, if, on the one hand, it would be impractical to allow managers free judgment, on the other hand, the elimination or prohibition of such practices would bring disadvantages to investors (Healy & Wahlen, 1999).

The literature suggests as the main types of earnings management practices: (1) target earnings, which are normally used in order to achieve a given accounting result, particularly when the manager intends to present a pre-defined outcome; (2) income smoothing (Albrecht & Richardson, 1990), where the manager seeks to minimize the results of the period – this practice is often pointed out in the literature as a way of disguising possible monopoly practices; (3) big bath accounting (Burgstahler & Dichev, 1997; Healy & Wahlen, 1999; Mohanram, 2003), where managers seek to aggravate losses so that they can withdraw higher future profits.

## 2.2. Earnings management in the accommodation sector

The study of earnings management practices applied to certain activity sectors was established as a research area relatively recently. The investigation of these behaviors has been developed in cases such as non-profit hospitals in the USA and Taiwan (Eldenburg et al., 2006; Hui-Fang, 2011; Leone & Van Horn, 2005); in the American restaurant corporate groups listed on the stock exchange (Gim et al., 2019; Upneja et al., 2008); Portuguese and Chinese firms listed on the stock exchange (Ding et al., 2007; Mendes & Rodrigues, 2006); firms exclusively of the European private sector, Portuguese and Norwegian, respectively (Coppens & Peek, 2005; Marques et al., 2011; Reksten & Kristiansen, 2011); firms of the European public sector (Ramos, 2012); and also the case of the hospitality industry in the US (Jiao & Lu, 2019), Spain (Esteban & Oliver, 2016; Esteban & Devesa, 2011a), and in the UK (Collier & Gregory, 1995).

Although literature applied to the hotel sector is almost non-existent, Paiva and Lourenço (2016), in a study about the determinants of earnings management in the hotel industry using a wide international sample of listed firms, documented that "firm characteristics, including the leverage ratio, cash flow from operations, investment opportunities and the frequency of losses, are the major determinant of earnings management in the hotel industry around the world".

In the same vein, Leone and Van Horn (2005), in a study about hospitals that have operational and management aspects similar to hotels, found evidence that the managers engage in these practices in order to achieve their self-proposed objectives, choosing fundamentally to (1) smooth income, (2) use the big bath technique in the year that there is a change of manager, and (3) avoid small losses.

Despite the research gap regarding earnings management practices in the hotel sector, Esteban and Devesa (2011a) use distribution models of frequencies and accruals to document that hotel managers in Spain choose to present small annual profits instead of small losses. They also point to the existence of weak financial control in this sector, which is characterized by fragmentation and a predominance of SMEs (for more details on the relationship between earnings management and SMEs, see, for example, Achleitner et al., 2014; Campa & Camacho-Miñano, 2014, 2015; Chansarn & Chansarn, 2016).

In addition, Esteban and Devesa (2011b) found evidence that internationalized firms in the hotel sector, when compared to non-internationalized, are more likely to adopt earnings management behaviors through

discretionary accruals, which might be explained by the larger size of these firms, as well as the different ease of access to funding outside of local markets.

In this context, the existing literature provides evidence that the practice of earnings management extends on a global scale and that they are behaviors that cross several industries, sectors, and countries. The preparation of studies on the subject of earnings management in diversified sectors and nations can be an important tool to understand the real impact of these practices on a global scale.

### 2.3. Hypotheses

This study aims to document empirical evidence on the real existence of manipulations in the values declared by Portuguese hotel sector firms and assess what the main determinants of managers are to engage in EM.

The literature review suggests that managers of private firms, as is the case of hotel units in Portugal, are sensitive to two types of reference values at the moment of the disclosure of fiscal results. First, managers give priority to the disclosure of positive results, that is, above zero, and second, to values equivalent to the results declared in the previous year.

In this study, and based on the existing literature, the existence of these practices was assumed when firms systematically disclosed results close to zero (Burgstahler & Dichev, 1997; Coppens & Peek, 2005; Esteban & Devesa, 2011a; Ramos, 2012). In this regard, based on the literature, the following hypothesis was formulated:

$H_1$  : Portuguese hotel sector firms adopt practices of earnings management in order to achieve earnings thresholds, and this can be found by observing discontinuities around zero for reported profitability.

As stated above, the motivations of managers to manipulate results stem from several factors. Watts and Zimmerman (1990) gave special attention to the relation of the debt ratio of the firms and the adoption of earnings management practices. These authors found evidence that firms with a higher debt ratio are more likely to adopt these practices in order to report higher results.

In addition, DeFond and Jiambalvo (1994) and Sweeney (1994) empirically proved manipulation of accounting data by managers when the firms are at the risk of default, where the manipulation is normally carried out in the year prior to the possible default. Thus, managers mask the firm's real economic and financial situation in order to obtain better payment terms among the creditors, namely through lower interest rates.

Healy and Palepu (1990) analyzed firms with high debt levels and suggested that these firms avoid the use of certain accounting practices that mask aspects related to the firms' debt. Additionally, DeAngelo et al. (1994) found evidence that firms with high levels of debt give preference to making accounting decisions that reflect the true financial difficulty of the firms as opposed to making decisions that systematically inflate firm income.

$H_2$  : The debt level of Portuguese hotel sector firms influences the practice of earnings management.

Several authors have widely studied the relationship between firm profitability and the practice of earnings management. However, the analysis of this topic has created opposite conclusions in the literature. Archibald (1967) and Ashari et al. (1994) argue that firms that have low profitability levels are more prone to engage in these types of practices; a fact that Mendes and Rodrigues (2006) assign to the need to transmit the notion of a controlled decline rather than a high variability in negative performances. The manager can, hereby, transmit controlled results in order to elude the stakeholders' perception of risk, and therefore ensure their trust in his management skills (Ramos, 2012).

On the other hand, Carlson and Bathala (1997) came to opposing conclusions. The authors proved empirically that the higher the firm's profitability, the greater the likelihood of the managers adopting earnings management behaviors. The authors believe that firms with higher profitability have more opportunities and tools to adopt these practices.

Similar to the studies of Mendes and Rodrigues (2006), this study measures profitability through the return on assets (ROA). Therefore, the following hypothesis was formulated:

$H_3$ : The profitability of Portuguese hotel sector firms influences the practice of earnings management.

### 3. Data description and methodologies

#### 3.1. Data description

This study aims to analyze the existence of earnings management practices in the Portuguese hotel sector. In order to achieve this, the SABI (Iberian Balance Sheet Analysis System) database was used for the collection of accounting information regarding the firms registered with the Economic Activity Codes (EAC) Rev. 3 "551 – Hotel establishments". EAC 551 – Hotel establishments is sub-divided into two categories, hotel establishments with and without a restaurant. With regard to establishments with a restaurant, they can be hotels, pensions, hostels, motels, apartment hotels, tourist villages, tourist apartments, and other accommodation establishments. In the present study, and for the EAC cited above, the timeline of the collected sample comprises the period from 2006 to 2013, yielding a final sample of 1,615 firms, which translates into 12,920 observations. This sampling period was established to incorporate the years affected by the 2008 financial crisis, an event that can make the use of earnings management even more relevant (e.g., Cimini, 2015).

The data obtained from the SABI database for the above-mentioned sample was the following: (i) net income; (ii) total assets; (iii) fixed tangible assets; (iv) equity; (v) return on equity (ROE); (vi) return on assets (ROA); (vii) sales; (viii) debt ratio; and (ix) cash flow.

When necessary, given the lack of certain economic and financial data of the firms that comprise the sample, and to ensure balanced panel data, the extrapolative method *naive I* was used to smooth the sample. Data smoothing was only performed when a maximum of two periods in a row was missing. Thus, when an absence of three years or more in a row was found, the firms were excluded from the sample, whether they were located in consecutive years or not.

#### 3.2. Methodology

##### *Test of hypothesis H1*

The methodology designed by Burgstahler and Dichev (1997) was used to test H1. The first study regarding the subject is from Hayn (1995), who concluded that firms tend to present discontinuities of the results around zero, especially presenting results slightly above zero, suggesting the existence of earnings management behaviors. These authors developed a methodology based on the analysis of the frequency distribution of cross-sectional earnings, assuming that this distribution is smooth in the absence of earnings management.

In this study, the variable used to construct the histograms was the net income of each firm for each period. To avoid heteroscedasticity problems in the construction of the histograms, we used the ratio between the net income for a specific year and the total assets of the immediately previous fiscal year of the firms belonging to the sample. We used this quotient as in the studies of Coppens and Peek (2005), Marques et al. (2011), and Ramos (2012).

Thus, the cross-section distribution of the results must follow a normal distribution in the absence of earnings management behaviors. On the contrary, if there is a discontinuity in the distribution and if there are few observations to the left of the reference point and many above, the existence of earnings management practices is considered.

The frequency distribution tests are extremely useful in assessing the presence of earnings management behaviors. However, with this methodology, it is impossible to identify the variables used for this purpose or the motivations that drive managers to engage in these practices. In this context, the literature suggests the use of probit and logit regressions in order to fill this gap (Carlson & Bathala, 1997; Marques et al., 2011; Oberholzer-Gee & Wulf, 2012; Reksten & Kristiansen, 2011).

The graphical distribution approach to detecting earnings management is divided into two steps: the construction of histograms and the execution of statistical tests. The construction of the histograms serves to graphically illustrate the observations of the firms' results, from which conclusions can be made about possible discontinuities. Regarding the statistical test used, also adopted by Burgstahler and Dichev (1997), the calculation of the Z statistic tests whether there are, in fact, discontinuities in the distribution of the presented data.

The construction of the histograms also requires the choice of an adequate interval amplitude, i.e., one that presents an optimized density (Degeorge et al., 1999; Marques et al., 2011). According to Holland and Ramsay (2003), when the interval amplitude is too small, the results obtained may not represent reality. However, on the other hand, if the interval is too large, some essential details may be ignored. For this purpose, four different tests were used to obtain the optimal amplitude, documented by Freedman and Diaconis (1981), Silverman (1986), who proposes two tests, and Scott (1992), respectively:

$$A = 2(IQR)n^{-\frac{1}{3}} \quad (1)$$

$$A = 0.79(IQR)n^{-\frac{1}{5}} \quad (2)$$

$$A = 1.06\sigma n^{-\frac{1}{5}} \quad (3)$$

$$A = 3.5\sigma n^{-\frac{1}{3}} \quad (4)$$

where  $A$  represents the adequate interval amplitude,  $IQR$  the variation between the sample's first and third quartile,  $\sigma$  the sample's standard deviation, and  $n$  the total number of observations in the sample. Silverman (1986) and Scott (1992) suggest that the amplitude of the intervals of a histogram should be positively related to the data variability and negatively related to the number of observations.

The method proposed by Burgstahler and Dichev (1997) was used to analyze the graphic distribution of the sample's net income scaled by lagged total assets. For the construction of this histogram, an amplitude of 0.0075 was used, which was obtained by applying the formula proposed by Freedman and Diaconis (1981), since the intervals of the formulas proposed by Silverman (1986) and Scott (1992) were higher and could mask details of the distribution.

### *Test of H2 and H3 hypotheses*

Cash flows reflect financial flows that occurred in a particular financial year. Earnings are determined on an accrual basis and reflect economic flows in a given financial year, no matter when the corresponding financial flow occurred or is going to occur. Therefore, for any given financial year, earnings differ from cash flows because they incorporate accruals.

In order to investigate the proposed hypotheses, the probability of a given firm adopting earnings management behaviors due to debt, return on assets, and size of firms was estimated, using: i) the results of the analysis of the frequency distribution of cross-sectional earnings; ii) the results obtained through models based on accruals.

Firstly, as mentioned above, having adopted the methodology of Burgstahler and Dichev (1997), a binary dependent variable was obtained, with a value of 1 if the net income falls within the first positive interval of

the distribution and zero otherwise. By obtaining a dependent variable of this nature, a regression model of qualitative choice was used, which determines the probability of such an event.

Regarding the regression model of qualitative choice, the probit model was used. Unlike the logit model, which is based on a logistic distribution, the probit model is based on a normal distribution. Both, as a rule, give very similar results, although the logit model has a flatter tail, which causes a certain probability to approach zero or one at a slower rate (Gujarati, 2004). The literature does not point out sufficiently strong reasons to choose one of the models over the other.

In this sense, the model used was the following:

$$EM_{it} = \beta_0 + \beta_1 END_{it} + \beta_2 ROA_{it} + \beta_3 DIM_{it} + \varepsilon_{it} \quad (5)$$

where  $EM_{it}$  denotes earnings management, proxied by a dummy variable with a value of 1 if the firm  $i$ , in the period  $t$ , present results in the first interval to the right of zero, or 0 otherwise;  $END_{it}$  represents the debt ratio;  $ROA_{it}$  represents the asset's profitability ratio;  $DIM_{it}$  represents the size (expressed by the total asset's natural logarithm) for firms  $i$  at time  $t$ .

Secondly, hypotheses were tested using the results obtained through the models based on accruals. The estimated coefficients in equation (6) were used to estimate the discretionary accruals of each firm in the sample through the following expression:

$$DA_{it} = b_0 + b_1 END_{it} + b_2 ROA_{it} + b_3 DIM_{it} \quad (6)$$

where  $DA_{it}$  is the discretionary accruals,  $END_{it}$  represents the debt ratio,  $ROA_{it}$  represents the asset's profitability ratio, and  $DIM_{it}$  represents the size (expressed by the asset's logarithm) for firms  $i$  at time  $t$ .

Through the expressions mentioned above, it is possible to measure the impact of each one of the explanatory variables in the practice of earnings management.

Balanced panel data were used for this study. The cross-sectional units are firms in the Portuguese hotel sector (see also Pacheco, 2016).

Hsiao (2003) adds that panel data usually provide the researcher with a large number of observations, increase the degrees of freedom and reduce the collinearity of the explanatory variables, consequently improving the efficiency of the econometric estimations (see also Baltagi, 2008).

Baltagi (2008) points out some limitations to this methodology: data collection and possible bias problems due to possible poorly designed data collection. Two estimation techniques were used to outline the issues described: the fixed-effects model (FEM) and the random-effects model (REM).

On the one hand, the fixed effects model assumes the singularity of each individual, and the estimations are made assuming the heterogeneity of the individuals captured in the constant, which varies from individual to individual but still does not vary over time. On the other hand, for the random-effects model, the estimation is made by introducing the heterogeneity of the individuals in the model's error since its behavior is unknown. This model does not consider the constant as a fixed parameter but as a random unobservable parameter.

To decide which of the two methods is the most suitable for this research, the Hausman (1978) test was used based on differences in the estimations of both models. According to Gujarati (2004), the null hypothesis of the Hausman test says that the estimations of the fixed effects model and the random-effects model do not differ substantially. When rejecting the null hypothesis, the fixed effects model should be chosen.

The modified Wald test was used to test the existence of heteroscedasticity. The Pesaran test was applied for both models to ascertain the existence or not of the cross-section dependence. Finally, to detect the existence or absence of autocorrelation, the Wooldridge test was used also for both models.

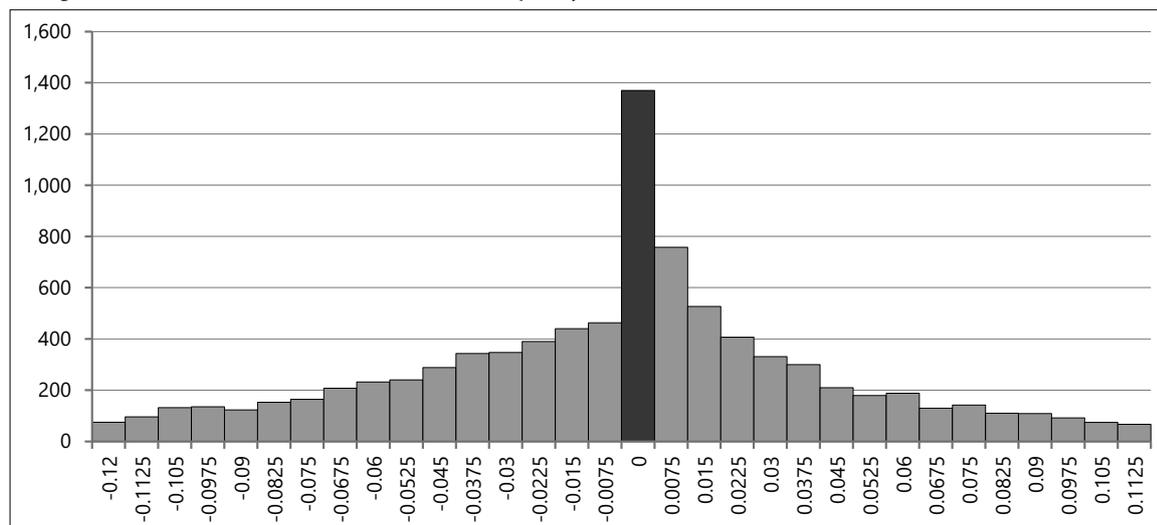
If the aforementioned problems occur at the level of autocorrelation, heteroscedasticity, and cross-section dependence, it is necessary to use an estimation that allows the results presented by the tests mentioned above to be strengthened. In the present study, when problems of this nature occurred, PCSE estimators were applied in order to strengthen the estimations. To carry out the regressions and tests mentioned above, the software STATA 14 was used.

## 4. Empirical analysis: Testing of hypotheses

### 4.1. Results of the tests of hypothesis H1

The histogram presented in Figure 1 shows the distribution of the net income for the timeline 2007 to 2013. Since the used amplitude is 0.0075, the first interval to the right of zero (the bar with the outlined color) contains the observations of the interval  $[0; 0.0075)$ , the second  $[0.0075; 0.015)$ , and so on. The histogram includes the observations in the interval  $-0.12$  to  $0.12$ .

**Figure 1**  
*Histogram of the cross-section distribution of the frequency of the converted net income*



By analyzing the graph, it can be observed that the distribution has a tendency towards a "single peak", albeit presenting several irregularities, particularly around zero. Thus, it is observed that there is a large amount of net income just above zero and a limited number below zero, compared to what would be expected if there was the assumption of the distribution's smoothness suggested by Burgstahler and Dichev (1997).

This idea is reinforced in a comparison between the interval immediately prior to 0,  $[-0.0075; 0)$ , and the interval immediately following the 0,  $[0.0075; 0.015)$ , where a considerable increase is found in the number of observations, from 463 to 758. The expected number of observations within the interval  $[0.0075; 0.015)$  would be 949, as opposed to the observed 758, whereas in the interval  $[-0.0075; 0)$  it would be 905, as opposed to the observed 463.

Table 1 shows the number of both the observed and expected firms in the intervals close to zero.

**Table 1**  
*Summary of both the observed and expected number of firms in the intervals close to zero*

	Negative intervals		Positive intervals	
	[-0.015 ; -0.0075]	[-0.0075 ; 0]	[0 ; 0.0075]	[0.0075 ; 0.015]
Nr of firms observed	440	463	1,370	758
Nr of firms expected	427	905	611	949

This visual trend is confirmed by the statistical tests, the Z-test, also devised by Burgstahler and Dichev (1997). In this test, the value -15.64 was obtained for the interval immediately prior to zero and 20.15 for the interval immediately above zero.

These values confirm the discontinuity around zero since the standardized difference is statistically significant for all the commonly accepted significance levels. In accordance with the study of Burgstahler and Dichev (1997), the assumption of the distribution's smoothness is rejected, and it is accepted that, in general, the firms of the Portuguese hotel sector adopt practices of earnings management to present positive results.

#### 4.1.1. Graphic distribution – Regression of the model

Table 2 presents the results of the regressions on the model with a dependent variable denoting earnings management proxied by a dummy variable resulting from the graphic distribution.

In this context, and observing Table 2, the similarity between the results of the amplitude of the various intervals used is noticeable, since all the variables present similar coefficients and statistical values, especially when comparing the column of the interval corresponding to the amplitude obtained from the formulas of Scott (1992) and of Silverman (1986). Also, note that all the coefficients present statistical significance.

**Table 2**  
*Results obtained through the regression of the model with the resulting dependent variable of the graphic distribution*

Independent variables	Freedman and Diaconis (1981) - Probit	Scott (1992) - Probit	Silverman (1986) - Probit
	Coefficient (z-value)	Coefficient (z-value)	Coefficient (z-value)
END	-0.2015362 (-5.20)***	-0.3796992 (-10.04)***	-0.3309388 (-8.71)***
ROA	0.7411264 (7.09)***	1.250893 (13.22)***	1.076398 (11.23)***
DIM	0.0918411 (8.62)***	0.069872 (5.86)***	0.0824563 (6.24)***
Wald $\chi^2$	152.65	312.51	257.12
Nr of observations	11,305	11,305	11,305

Note: The significance levels are represented by asterisks, being that \*\*\* refers to a significance of 1% and \*\* to 5%.

Regarding the results obtained, the three variables, END, ROA, and DIM show statistical significance at the 1% level in the three regressions, regardless of the amplitude of the interval.

Therefore, the choice of amplitude has no impact on the results obtained. Still, the importance of choosing the amplitude, obtained by the formula of Freedman and Diaconis (1981), is emphasized since it presents a more visually understandable histogram.

Analyzing the column related to the selected amplitude, the results indicate that return on assets and size have a positive relationship with the disclosure of net income close to zero by Portuguese hotel sector firms (in the interval [0; 0.0075]), while debt has a negative relationship.

## 4.2. Results of the tests of hypotheses H2 and H3

As mentioned in the methodology section, the model proposed by Jones (1991) was used for the estimation of the discretionary accruals. Table 3 shows the results obtained.

**Table 3**  
*Estimates obtained from discretionary accruals*

Independent variables	FEM	REM	PCSE
	Coefficient (t-value)	Coefficient (z-value)	Coefficient (z-value)
1	-38,213.97	-37,488.46	-45,228.63
$A_{it-1}$	(-11.47)***	(-13.61)***	(-6.22)***
$\frac{\Delta R_{it}}{A_{it-1}}$	0.0062655	0.0142637	-0.0103902
	(2.37)**	(5.27)***	(-0.55)
$\frac{\Delta TFA_{it}}{A_{it-1}}$	-0.0310029	-0.0318065	-0.0282404
	(-141.39)***	(-163.94)***	(-13.76)***
Nr of observations	11,305	11,305	11,305
$R^2$	0,853	0,8537	0.7010
Wald $\chi^2$	20,583.24***	69,579.16***	298.44
Modified Wald test	8.2e+22***	-	-
Pesaran test	109.839***	111.672***	-
Wooldridge test	37.678***		-
Hausman test	0.15 (prob 0.6985)		-

Note: The significance levels are represented by asterisks, being that \*\*\* refers to a significance of 1% and \*\* to 5%.

When analyzing Table 3, it appears that the coefficients of the three studied variables, used as estimation parameters of discretionary accruals, present statistically significant values at the 1% and 5% levels.

However, specifically analyzing the columns of the fixed and random effects models, it is possible to observe that there are problems of heteroscedasticity evidenced in the modified Wald test, problems regarding the cross-section dependence in Pesaran's test, and also autocorrelation problems in Wooldridge's test.

In order to make the results robust against the three problems, the model was estimated using PCSE.

Table 4 shows the results of the regressions to the model resulting from the estimation of the discretionary accruals, as well as the robustness test. In accordance with the techniques used in the regression of the Jones (1991) model, the fixed effects and random effects models were also applied.

In order to choose one of the models, it was necessary to analyze the statistical value of the Hausman (1978) test, which presents a statistically significant value with a significance of 1%. In this sense, the null hypothesis that assumes the consistency of the estimator of random effects is rejected, and this way, the method of fixed effects is chosen.

**Table 4**  
*Results obtained from the regression of the model with a dependent variable resulting from the estimation of discretionary accruals*

Independent variables	FEM	REM	PCSE
	Coefficient (t-value)	Coefficient (z-value)	Coefficient (z-value)
END	0.0382307	0.0485945	0.0750393
	(4.43)***	(6.03)***	(2.04)**
ROA	-0.4245604	-0.452802	-0.0153942
	(-19.27)***	(-21.35)***	(-0.11)
DIM	-0.2638594	-0.2321562	0.0150695
	(-15.04)***	(-32.43)***	(7.10)***

Table 4 (continued)

Independent variables	FEM	REM	PCSE
	Coefficient (t-value)	Coefficient (z-value)	Coefficient (z-value)
Nr of observations	11,305	11,305	11,305
$R^2$	0.3103	0.3162	0.0254
Wald $\chi^2$	382.17***	2,265.51***	319.72***
Modified Wald test	6.2e+10***	-	-
Pesaran test	35.700***	33.798***	-
Wooldridge test	13.098***		-
Hausman test	75.58 (prob. 0.0000)		-

Note: The significance levels are represented by asterisks, being that \*\*\* refers to a significance of 1% and \*\* to 5%.

Regarding the obtained results, it can be seen that there is only statistical significance in the explanatory variables END and DIM, at the 5% and 1% levels, respectively. On the other hand, the variable ROA ceased to be significant when subjected to the PCSE robustness test.

The results also indicate that the discretionary component of the accruals of Portuguese hotel sector firms is positively influenced by debt and firm size.

### 4.3. Discussion of the results

Despite the growing research related to earnings management, there is limited empirical validation in the hotel sector, particularly the Portuguese case, a fact that supported the development of this study. This study was carried out, taking the methodologies already developed to validate the hypotheses into account (Burgstahler & Dichev, 1997; Jones, 1991). Furthermore, the aim was to empirically test for the adoption of earnings management practices by Portuguese hotel sector firms and the factors that influence their adoption.

The results obtained prove the practice of earnings management in the context of the Portuguese hotel sector. From the frequency distribution analysis for 2007-2013, a tendency to disclose results close to zero (with quite a frequent periodicity) was observed in firms of this sector. Through the statistical analysis Z, it was found that there are statistically significant differences in the distribution compared to a scenario in which there was no evidence of earnings management practices.

The firms' propensity to engage in earnings management practices to avoid breaks in the results was also analyzed; however, this was not observed since there were no statistically significant differences in the distribution.

The results obtained through the graphical analysis seem to confirm the empirical evidence in the literature, namely, in the studies of Burgstahler and Dichev (1997), Holland and Ramsay (2003) in the case of the Australian firms, Coppens and Peek (2005) for European firms, Ramos (2012) in the case of the European public sector, and Esteban and Devesa (2011a) for the Spanish hotel sector firms, which proves hypothesis 1.

Once the adoption of earnings management practices by the firms of the Portuguese hotel sector was proved through the graphical analysis, this study then focused on the determinants for the use of these practices. To achieve this, the two models previously described were estimated.

Observing the results shown in Tables 2 and 4, it is possible to claim that debt influences the adoption of earnings management practices by firms in the Portuguese hotel sector. This variable is statistically significant in both models, at a significance level of 1% and 5% in the regression of the graphical distribution model (column 1 of Table 2 – Freedman and Diaconis 1981) and in the regression of the discretionary accruals model (column 3 of Table 4 – PCSE), respectively. The first model suggests that debt has a negative effect on the adoption of earnings management practices, while the second model highlights a positive influence.

Thus, through the results generated by the probit model, it can be concluded that the higher the debt of Portuguese hotel sector firms, the lower the probability of engaging in earnings management practices will be, according to Healy and Palepu (1990) and DeAngelo et al. (1994), for example.

On the other hand, when analyzing the estimation results using the PCSE, there is an opposite conclusion; that is, the higher the debt of the firms, the higher the value of the accruals will be, a similar conclusion to that documented by Watts and Zimmerman (1990), Sweeney (1994), Carlson and Bathala (1997), Ramos (2012) and Paiva and Lourenço (2016).

The studies mentioned previously found similar evidence and point to the costs associated with an eventual failure of the financial contracts as the main motivation for managers to engage in earnings management practices. It was then concluded that the firms with a higher level of debt have a greater propensity to manipulate the results upward to mask their real financial situation and avoid the break of certain fixed terms in the financing agreements.

Regarding the variable return on assets and analyzing the data in Table 2, it appears that this also influences the practice of earnings management. Taking the probit model into account, a statistical significance of this variable at 1% is denoted and suggests that the return on assets increases the likelihood of the firm showing results in the first positive interval of the histogram, [0; 0.0075). The higher the return on assets, the greater the likelihood of Portuguese hotel sector firms applying earnings management practices. This conclusion is consistent with the evidence found in the study of Carlson and Bathala (1997). In accordance with these results, the validity of hypotheses 2 and 3 was demonstrated.

In the results related to the size of the firms, both models presented results that demonstrated that the size increases the likelihood of Portuguese hotel sector firms engaging in earnings management practices. In this context, the higher the size of the firms, the higher the likelihood will be of managers presenting results in the first positive interval of the histogram, of [0; 0.0075), and it also shows a positive impact on the discretionary accruals (Barton & Simko, 2002; Paiva & Lourenço, 2016).

## 5. Conclusions

This study focused on analyzing earnings management practices in the specific context of the hotel sector in Portugal for the period from 2006 to 2013. It should be noted that the previous empirical studies come from other countries and industries, so this article aims to contribute to the hotel sector in Portugal with new data.

Initially, the objective of this study was to ascertain the existence, or not, of earnings management practices in the Portuguese hotel sector. After validating this hypothesis, an attempt was made to understand and perceive what motivates managers to engage in these practices.

In this sense, this research has made a new contribution concerning the direct association between earnings management and the financial indicators of Portuguese hotel sector firms. The main objective of this research was to ascertain the existence of an association between the practices of earnings management and specific financial characteristics of these firms. The results obtained empirically support the main research question.

Portuguese hotel sector firms do not seem to be insensitive to the declared financial results. Therefore, they may engage in earnings management practices when they aim to achieve certain financial results that are in line with the previously outlined objectives.

Additionally, as demonstrated by the two methodologies adopted, it was concluded that, on the one hand, the greater the return on assets and the size of hotel sector firms, the greater the likelihood will be of engaging in earnings management practices. On the other hand, regarding the variable debt, the tests confirm the statistical significance of this variable even if an opposite effect in the two models is denoted since, in the probit model, there is a negative relationship while in the PCSE estimator, there is a positive relationship.

This research is of added value for researchers, stakeholders in the hotel industry, and to the political/public decision-makers, among others, because of the importance that this sector has in GDP, since now practitioners are more aware of the potential existence of earnings management practices in the hotel industry, and also for their determinants. For policymakers, it is of use when, for example, tailoring programs to improve competitiveness in the hotel industry. For practitioners, this research exposes particularities of firm-level EM practices and their determinants that should be considered for financing and investment decision-making, for example.

Despite the results obtained, this investigation has some limitations, namely in terms of sample collection. Regarding the central premise of the investigation, which assumes that a company adopts earnings management practices when it is in the first interval to the right of zero, it is essential to note that not all companies that present results in this interval necessarily engage in this type of practices. In this sense, certain companies that also engage in earnings management practices may not necessarily be in the first interval to the right of zero, since this type of practice, as previously mentioned, can be used in order to obtain a certain result, which does not imply it must be close to zero.

It is relevant to reiterate that Jones's (1991) proposed methodology also has some limitations that must be considered when interpreting the results. Concerning possible future research, it is suggested to conduct a study within the hotel sector or companies in the tourism sector, but which includes a more comprehensive sample, namely, in the European context. On the other hand, it would also be pertinent to study and quantify the impact of earnings management practices in the hotel sector. In addition, it is suggested that a study be carried out to compare samples of business groups, composed of several companies in the tourism/hotel sector, with standalone companies, which would allow the type of organizations to be gauged in which earnings management practices are resorted to more often.

Finally, studying the incentives that may influence a manager's decision to engage in earnings management in the hotel industry and using more updated accruals models that capture earnings management in SME would also be interesting topics to study (e.g., Harris et al., 2018; Barua et al., 2019; Byzalov & Basu, 2019).

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