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The impact of hotel operational factors and crises on corporate debt

El impacto de los factores operativos de los hoteles y las crisis en la deuda de las empresas

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ABSTRACT

Tourism is an important sector for the development and economic growth of a country and the work and dynamism of hotels in this context is fundamental. Therefore, companies may take on debt to enable greater investment, which can enhance the quality of their operational activities in the hotels they manage. Bearing this in mind, this study seeks to identify the operational factors - specifically hotel characteristics - that affect the debt of Portuguese hotel companies, also during periods of crisis. Based on a sample of 9842 observations from 1191 hotel companies between the years 2005 to 2020, both descriptive and inferential analysis were conducted using the ordinary least squares method. The results show that a hotel's debt is positively influenced by its star rating but negatively affected by its ownership. For younger companies, the relationship with debt is positively influenced by ownership and negatively impacted by the hotel brand. The study also concludes that the debt of these companies tends to increase during periods of economic or financial crisis.

Keywords: Companies indebtedness, hospitality, hotel characteristics, periods of recession.

RESUMEN

El turismo es un sector importante para el desarrollo y el crecimiento económico de un país y el trabajo y el dinamismo de los hoteles en este contexto es fundamental. Por lo tanto, el endeudamiento de las empresas puede permitir mayores inversiones y apalancar una mayor calidad de la actividad operativa de los hoteles que explotan. Teniendo esto en cuenta, el objetivo de este estudio es identificar los factores operativos -características de los hoteles- que afectan al endeudamiento de las empresas hoteleras portuguesas, incluidos los periodos

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de crisis. A partir de una muestra de 9842 observaciones, correspondientes a 1191 empresas hoteleras, para el período de 2005 a 2020, se realizó un análisis descriptivo e inferencial por el método de mínimos cuadrados. Los resultados muestran que la deuda está influida positivamente por la clasificación por estrellas y negativamente por la propiedad. En el caso de las empresas más jóvenes, la deuda se ve influida positivamente por la propiedad y negativamente por la marca del hotel. El estudio también concluye que la deuda de estas empresas tiende a aumentar en periodos de crisis económica y/o financiera.

Palabras clave: Deuda de las empresas, hostelería, características de los hoteles, periodos de recesión.

I. INTRODUCTION

Hospitality plays a crucial role in generating wealth and employment in Portugal, and its significance has grown over the years. To develop the hotel business, companies require financing not only for the acquisition or construction of the base building of the activity, but also for implementing their operational strategy. In this sense, the financing needs of companies can vary significantly based on their chosen strategy, such as brand sharing, hotel category, and hotel properties.

Several studies have analyzed the determinants of debt levels in the hotel sector. Factors such as firm size, asset tangibility, and sales growth tend to contribute to higher debt levels (Mundi & Gautam, 2021; Gomes et al., 2023; Matias et al., 2018; Li & Singal, 2019). Conversely, factors like firm age and profitability are associated with lower debt levels (Mueller & Sensini, 2021; Matias et al., 2018), as well as sales growth (Arachchi, 2020).

Although many studies address the level of indebtedness among companies in the hotel sector based on common determinants, as explained in the context of the Pecking Order Theory and the Trade-Off Theory (Myers, 1984; Kraus & Litzenberger, 1973; Serrasqueiro & Caetano, 2015; Frank & Goyal, 2009), there are few studies that explore how operational factors specific to hotels affect the debt levels of these companies. For this reason, Li and Singal (2019) argue that future studies should focus on the determining factors of companies that operate branded and non-branded hotels and of companies that own hotels and those that don't, as well as other specific variables that can explain the financial behavior of companies in the hotel sector.

Despite the fact that they already exist in the literature, studies on the impact of brand affiliation, hotel ownership, and hotel category on a company's level of indebtedness is still scarce. For example, Sohn et al. (2013) mention that during the last two decades prior to their study, many hotel chains in the United States changed their strategies to what they call “Asset-Light and Fee-Oriented (ALFO)”. Their findings indicate that companies adopting a strategy of minimizing their investments in fixed assets were able to reduce their operational risk, which had a positive impact on the company’s overall value. Li and Singal (2019) also point out that some companies in the hotel sector have adopted a strategy of not owning hotels and instead investing more in technology and loyalty, using franchising contracts. This approach is kinked to lower debt. Poretti and Heo (2022) concluded that, in the short term, companies within the hospitality sector that implement an asset-light strategy, which reduces the level of debt, have been able to mitigate the negative reactions of the capital markets during the crisis caused by COVID-19. Additionally, Santos et al. (2021) found that the stars rating of hotels significantly

influences the liquidity of hotel management companies in Portugal. They identified a strong negative relationship between the high number of stars and the level of current liquidity of companies.

Over the last 20 years, Portugal has experienced economic and financial crises that have significantly impacted the operational activities of these companies. On the one hand, the 2008 international financial crisis was reflected in a sovereign debt crisis that may have had an impact on the financial capacity that companies in the sector had to resort to credit. On the other hand, the COVID-19 pandemic restricted travel and tourist flow had an unprecedented drop. Many hotels were forced to close due to a lack of customers, leading some to reach inactivity levels.

This study aims to analyze whether operational factors related to the hotels that companies operate – such as brand, category, and hotel ownership - imply higher or lower levels of debt. Additionally, it examines whether this debt increases during periods of financial crises or crises such as COVID-19. Therefore, in order to understand which operational factors affect the indebtedness of Portuguese hotel companies in Portugal, a multivariate linear multiple regression analysis was conducted, covering the years from 2005 to 2020. The results show that hotels with higher star ratings tend to have a higher level of debt. Moreover, younger companies experience lower indebtedness when the company does not own the hotel property and when the hotels they operate share a brand. It should also be noted that during financial or economic crises the debt of hotel companies generally increase.

This study contributes to the literature in three ways. First, it investigates the debt of Portuguese hotel companies over the years, including the analysis of the financial crisis and the COVID-19 pandemic. Second, it adds information to the literature on the hotel industry. It is a different study from the previous ones in that it seeks to understand the impact of operational factors on the hotels managed by these companies. While previous studies such as Pereira et al. (2022) have analyzed the debt structure of Portuguese hotel companies in the context of financial crises, this study offers a novel perspective by explicitly incorporating operational factors - such as brand affiliation, hotel category, and property ownership - as key determinants of the debt structure of companies in the sector. Third, the study seems to be very useful for managers of companies with hotels, in order to evaluate their strategies and financing alternatives considering investments in the developed activity. The relevance of this research is based on the need for empirical studies of Portuguese hotel companies and their specificities. Overall, this study will provide a tool for investment decision-making in the lodging industry by identifying the factors that impact the level of liquidity.

The work plan contemplates four sections. The following section is the literature review that addresses debt theories and the operational factors that affect the debt of hotel companies. The second section presents the databases, the methodology, and the variables used. Next is the empirical study that highlights the main results. The paper ends with the conclusion.

II. LITERATURE REVIEW

2.1 Debt theories

The debt of companies is important for their operational activity, as well as to leverage investments. Companies generally have equity and borrowed capital as sources to finance

their activity. Barbosa and Pinho (2016) note that companies can obtain internal financing based on cash flows generated throughout the year, while external financing can be obtained through credit from private sources or in financial markets, particularly for new projects.

Several theories study capital structure and highlight the benefits and drawbacks related to the source of financing, whether through debt or equity. The Trade-off Theory recognizes that, on the one hand, debt generates advantages for the company because interest is tax deductible. However, on the other hand, after a certain level of debt, agency costs and insolvency costs increase substantially, which negatively affects its value (Myers, 1984; Kraus & Litzenberger, 1973; Serrasqueiro & Caetano, 2015).

In the Agency Theory, given the separation of powers between management and ownership of the hotel establishment, the owners delegate to management the company's administration. However, several agency problems may arise because the interests of both may not coincide, so conflicts of interest arise (Jensen & Meckling, 1976). With lower levels of debt, managers will have more freedom to use the companies cash flow, being able to take on low return projects and buy unnecessary physical assets to increase the size of the company, increasing its reputation and act according to their personal interests, while in companies with higher debt the commitment to repay debt and interest leaves managers with less freedom to distribute cash-flows and therefore need to be more efficient in choosing investments and as such improving the company's performance. Note that when a company uses third-party capital conflicts arise between shareholders and creditors, which are aggravated when the company experiences greater financial difficulties (Pacheco & Tavares, 2017).

In Pecking Order Theory, Myers (1984) claims that the capital structure results from several successive optimal decisions, among the sources of financing in a hierarchical manner, aiming to decrease the costs originated by information asymmetry (Dao & Ta, 2020). This approach argues that a firm's investment opportunities are first financed by internally generated funds. Then, firms should finance themselves by issuing debt, which has a lower level of risk. Finally, firms choose the source of financing that has the highest information costs, which is the issuance of equity.

Finally, Ross (1977) presents the Signaling Theory, which is based on the importance of information asymmetry between management and shareholders. Thus, the choice of the debt/equity ratio is related to the willingness of management to make information available to investors. Myers and Majluf (1984) also mention that management resists issuing equity when it believes the firm's value is undervalued. Consequently, investors tend to consider issuing shares as a bad sign, if managers only offer shares to the public if they have a fair or overvalued price. Thus, there is a positive relationship between leverage and financial performance in Signaling Theory.

In the context of the hospitality industry, Elgonemy (2002) summarizes the importance of debt in the hospitality industry as follows: leverage in hotel real estate investment is a way to maximize the return on capital through a relatively small down payment; interest payable to creditors acts as an incentive that forces hotel management to maintain efficiency, since if management becomes lax and net operating income declines the shareholder does not get a return; as interest on debt is tax deductible, the company's cash flow improves; high debt levels impose potential costs associated with default risk and loss of financial flexibility;

leverage can in some cases “enslave” a hotel to the lender, and stifle management creativity and energy.

Regarding debt in the hotel sector, a few studies have been found that analyses relevant factors, although none address the importance of operational factors in these firms. Mueller and Sensini (2021) study the determinants of hotel sector debt of 145 Italian SME between 2010 and 2018 and concluded that the most profitable SME prefer to use profits rather than debt to finance investments. The study highlights that the debt of (hotel) firms is positively affected by growth opportunities and negatively by age and profitability, with firm size being insignificant for debt. Also, Rajan & Zingales (1995) find a negative sign on the firm's profitability with debt.

For the Portuguese market, no studies were found on the determinants of operational factors on hotel sector debt. However, studies were found on some financial factors. Matias et al. (2018), Pacheco and Tavares (2017) and Vieira and Novo (2010) study this industry on the Portuguese market. Also, Pereira et al. (2022) analyzed the impact of several financial variables on hotel companies between the years 2005 and 2020 and concluded that larger hotel companies incur more debt, show a negative relationship between profitability and debt, and companies with larger opportunities are more prone to indebtedness. Because they can offer greater collateral to creditors, firms with more tangible fixed assets tend to have easier access to financing. It should also be noted that younger firms have greater difficulty accessing credit or using other strategies instead of going into debt.

2.2 Hotel´s operational factors

Companies in the hotel industry have some important characteristics that are intrinsic to their activity, such as the high dependence on fixed assets, and may be relevant for financing. Thus, since several factors may contribute to debt, the focus of this paper is on the analysis of several aspects of the operational activity of companies in the hotel industry. As such, and as far as we know, no other studies have been found in the literature on the subject, the impact of operational factors is studied, as well as the impact of periods of crisis.

2.2.1 Hotel brand

Branding is a differentiating factor when choosing a hotel within this industry, where there is a lot of competition. The hotel brand is a distinguishing factor between hotels, which can be classified as a branded hotel (belonging to a hotel chain) or an independent hotel.

A hotel’s brand and reputation are related to the physical appearance of the hotel, such as logo and name, attitude, and brand recognition (Foroudi, 2019). To build a logo, companies spend a lot of money, time, and research, which positively influences customers and a company's perceptions (Foroudi et al., 2014). Thus, it becomes necessary to make significant investments in brand and logo development that add value to their reputation (Van Riel et al., 2001; Silva et al., 2017). Given the need to make greater investments in an intangible asset such as the brand, there is expected to be greater financing needs in companies that develop their own brands when compared to companies that share a brand. This idea is confirmed by Li and Singal (2019), who point out that companies in the hotel sector that have adopted a strategy of investing more in technology and loyalty using franchising contracts have lower indebtedness.

H1: Companies with branded hotels have lower debt than companies with independent hotels.

2.2.2 Star ratings

The classification of hotels based on the number of stars allows us to understand the quality of the hotel. The higher the number of stars, the higher the perception of customers regarding the quality of the hotel, which will be associated with more facilities, a greater variety of services and larger rooms and bedrooms. In this sense it is expected that a 5-stars hotel will have to make larger investments that will have to be financed, either by its own capital or through external financing.

On the one hand, Santos et al. (2021) concluded that the number of stars is what most influences the liquidity of companies that manage hotels in Portugal and found a strong negative relationship between the high number of stars and the level of current liquidity of companies. On the other hand, Dalci et al. (2019) concluded that liquidity is negatively related to both the total debt ratio and long-term debt ratio. We can, therefore, deduce that there is a positive relationship between the hotel ratings and the level of indebtedness of the companies that operate them.

H2: Firms with hotels rated with a higher number of stars have higher debt.

2.2.3 Ownership of the hotel establishment

In the hotel industry, the ownership of the hotel building can be separated from the management of the hotel. In the former case, the company controls all relevant factors of the business, while in the latter, it only focuses on the strategic and operational management of the business. Many hotel operators choose to lease the properties instead of purchasing them by obtaining financing (Lee et al., 2015). The hotel industry has used operating leases for equipment and as a financing tool for acquiring property (Koh & Jang, 2009). Operating leases can be used by companies to acquire/use, for example, telecommunications equipment, computers, kitchen equipment, and beds, among others. It is also used to acquire, for example, land, offices, and hotels (Lee et al., 2015). Operating leases can be a substitute for debt, considering that they can be used for financing, much like debt financing (Lee et al., 2015).

Thus, when the hotel entity owns the property, it is expected to have a higher level of debt, considering that the financing obtained will be to invest not only in the operational structure, but also in the equipment and real estate necessary for operation. If the hotel entity does not own the hotel structure and its operations are based on an operational lease, the level of debt is expected to be lower because the real estate structure and equipment are already part of the lease. Companies in the hospitality sector that adopt an asset-light strategy reduce their level of debt (Li & Singal, 2019; Poretti & Heo, 2022).

H3: Companies with hotels that own the property have higher debt.

2.2.4 Economic and financial crisis

Portugal has already experienced several periods of economic and financial crisis. One of the most recent was the financial crisis of 2008, which was only felt more intensely in Portugal in 2011-2014, with the sovereign debt crisis. However, the COVID-19 crisis appears to be the most severe of the crises since 1980 in Tourism (Skare et al., 2021). Compared to

other recessions in Portuguese history, COVID-19 highlights the unexpected nature of the shock.

The major difference between COVID-19 and the financial crisis of 2011-2014 has to do with the fact that the former affected the entire economy in general, led to the closure of many establishments and drastically lowered the demand for many services and products, particularly in the tourism sector in general, and the hotel industry in particular. On the other hand, the financial crisis had a greater focus on financial creditors, which had an impact on the liquidity of the financial system, and on businesses. With the credit crunch and the sovereign debt crisis, Portugal requested a financial rescue from the European Union, the International Monetary Fund, and the European Central Bank - called the Troika - which consisted of global loans of about 78 million Euros. In terms of the hospitality industry, it is expected that companies in the Portuguese hospitality sector have increased their indebtedness in the period between 2010 and 2014.

The recent COVID-19 pandemic induced governments around the world to shut down much of their economies to contain the spread of the virus, but that could lead to a liquidity crisis for most companies (Acharya & Steffen, 2020). Thus, companies sought liquidity through credit lines, as seen with the substantial increase in credit in the last 3 weeks of March 2020 when the World Health Organization announced COVID-19 as a global pandemic emergency risk (Ellul et al., 2020). Many companies, including those in the hospitality industry, were forced to stop operating for some time, or operating with various tight safety rules imposed by the government, which also led to layoffs of their workers. The hotel industry was one of the sectors most affected by this pandemic. As the borders between countries were closed and there could not be movement between countries with a very high risk of virus transmission, travel was restricted as planes, cars, trains, boats, and other types of transport stopped circulating as frequently. As a result, travel agencies, restaurants, hotels, and other activities linked to the sector have had to close temporarily.

This situation has created uncertainty in demand, which has a potential impact on the volatility of the companies operating results, and thus on the risk of bankruptcy of hotel companies. Demand volatility induces an increase in corporate risk due to high volatility and uncertainty of profitability, which may lead to lower debt in order to control the probability of bankruptcy.

According to the latest data from the World Tourism Organization (Škare et al., 2021), this sector suffered the worst year in history in 2020, with a decrease of 74% in the number of international tourists. Because of the decline in demand due to travel restrictions and the COVID-19 pandemic, the number of international tourists to global destinations in 2020 decreased by 1 billion compared to the previous year (INE, 2022). The WTO predicted that international tourist numbers in 2020 could decline by about 60% to 80%, and revenue could drop by about $910 billion to $1.2 billion, being almost equivalent to one-third of the amount recorded in 2019 (Daniel & Fernandes, 2020). The number of international tourists has decreased to minimal levels with important financial losses in the companies operating in the tourism sector. At the national level, overnight stays in tourist accommodation establishments between March 2019 and March 2020 decreased by about 58.5% overall (Daniel & Fernandes, 2020).

Pereira et al. (2022) concluded that, for Portugal, in periods of financial (sovereign debt crisis) and economic problems (caused by the global economic impact of COVID-19) the level of debt in companies in the hospitality sector increases significantly. This can be explained since governments are available to support companies about their operational activities with governmental programs that facilitate loans (Tascón et al., 2024). Ashraf et al. (2025) carried out a study involving European companies of different sizes in the hospitality and tourism sector, concluding that indebtedness is higher during the COVID-19 pandemic, especially in small companies and listed companies than in larger and private companies.

H4: In periods of crisis the debt of companies in the hotel industry increases.

In summary, by relating the debt theories and the operational factors discussed, it can be concluded that the theories that favor the use of debt by companies over other sources of financing also tend to advocate that companies opt for operational factors that imply a greater use of debt. Thus, according to the Trade-off Theory, the Agency Theory, and the Signaling Theory, companies in the hospitality sector can be expected to operate hotels with their own brand, with as many stars as possible, and to own the real estate where the hotels operate. In contrast, according to the Picking Order Theory, companies in the hospitality sector should operate hotels with a shared brand, with the lowest number of stars, and not own the real estate where the hotels operate. These ideas are illustrated in Table 1.

Table 1. Relation between debt theories and operational factors

Operational Factors	**Debt Theories**			
	Trade-OFF [+Debt]	**Agency** [+Debt]	**Pecking Order** [-Debt]	**Signaling** [+Debt]
Brand [-Debt]	-	-	+	-
Category [+Debt]	+	+	-	+
Ownership [+Debt]	+	+	-	+

III. METHODOLOGY AND DATA

The study's main objective is to analyze the determinants that most contribute to debt, focusing on operational factors related to the activities of hotel companies. Additionally, the impact on corporate debt in periods of economic and financial crisis is analyzed. Before presenting the methodology, a brief characterization of the hotel business in Portugal is given.

3.1. Why Study the Case of Portugal

Tourism in Portugal has been recognized worldwide, revealed through the numerous awards and distinctions it receives yearly from the international community such as the World Travel Awar (WTTC), among other differentiating awards (Costa, 2021).

In the last decade, this sector has experienced considerable growth and has been one of the main drivers of the Portuguese economic recovery (Pacheco & Tavares, 2017). However, with the COVID-19 crisis, this was the first sector to be negatively impacted and severely affected due to travel bans and restrictions (Chinazzi et al., 2020) and mobility disruptions. In addition to travel restrictions, country authorities recommended and discouraged non-essential travel (Rajbhandari et al., 2020), which was related with the prevention of further spread of diseases such as COVID-19 (Gan et al., 2020; Shi et al., 2020). This had impact in new behaviors towards practicing life-preserving activities. The number of

operational hotels in Portugal decreased significantly in 2020, which seems to be related to the pandemic COVID-19, which may justify the bankruptcy of companies, since the sharp decrease of more than 50% in revenues in this sector (INE, 2022).

In the tourism industry, the hotel sector has an important impact on the economy, and hospitality is responsible for offering hospitality to tourists and travelers. This industry, in addition to managing hotels, also encompasses apartment hotels and aims to operate in the areas of lodging, food, security, entertainment, and other activities related to guests' well-being (Bresciani et al., 2015). The hospitality industry is characterized by a high level of capital intensity and a relatively low level of operating inventories (DeFranco & Lattin, 2006). Hospitality companies are very sensitive to changes in the economy and depend on the discretionary spending of their customers (Guillet & Mattila, 2010).

Note that hotels are establishments whose main activity consists in the provision of accommodation and other ancillary or support services, with or without the provision of meals. This industry is characterized mainly by its intangibility, labor-intensiveness, and high investment in assets, such as buildings. However, companies sometimes resort to leasing. The intangibility due to the provision of services, as profitability results from a service not embodied in a physical good. This industry is also labor intensive, as much human capital is required for the functionality of the services. Firms in this industry, compared to others, have greater competition, greater leverage, and higher capital intensity, which affect management decision making and can, in turn, affect the corporate governance mechanisms adopted (Singal, 2015).

Finally, companies in the hotel industry are characterized by a high level of fixed assets, which serve as guarantees to creditors in financing contracts. As the development of their activity requires at least one building to provide rooms and other facilities for a hotel establishment, a large investment in fixed assets is required. However, the hotel industry often uses operational leasing not only for the operation of the equipment, but also as a financing instrument (Koh & Jang, 2009), for other types of activities necessary for the operation of the hotel.

3.2. Data and Method

Data were collected from two databases for a 16-year time horizon, from 2005 to 2020. In SABI we collect data on Portuguese hotel companies' economic and financial information. In Registo Nacional de Turismo (RNT) we collect information on hotel establishments legally authorized to operate in Portugal. The choice of time horizon allows us to analyze the evolution of debt in the 2008 financial crisis, with its impact in Portugal after 2010 and during the COVID-19 pandemic.

We begin our data collection with financial data from SABI, gathering 84993 observations (that correspond to 5,312 companies). In the process of joining the databases, only companies with hotels identified in the RNT were considered, having eliminated companies with incomplete data in the period or with no operational activity data. Then, we removed data from companies without financial data available, and we get 10207 observations (to 1077 companies). We have done additional analysis on the missing data. Therefore, the final sample has about 9842 observations, corresponding to 1001 hotel companies.

The explanatory factors used to explain debt are mostly the main operational characteristics of firms in the hotel industry. In addition, several control variables are used, namely, the nationality of investors and some financial data for the period 2005 to 2020, which allows analyzing two periods of crisis in Portugal and its effect on corporate debt. In this sense, the econometric model of multiple linear regression (OLS) has the following specification:

$$DEBT_{it} = \beta_0 + \beta_1 BRAND_{it} + \beta_2 CAT_{it} + \beta_3 PROP_{it} + \beta_4 REC_{it} + \sum CONTROL_{it} + \varepsilon_{it} \quad [1]$$

The dependent variable is the company debt, which is influenced by hotel operational characteristics and controls variables like the companies' performance, size, age, risk, growth opportunities, tangibility, and nationality of the shareholder. Finally, at the end, ε_{it} are the model residuals. However, since the dependent variable is between 0 and 1, a TOBIT estimation approach is also used in this research. This estimation is also known as censored or limited regression models from 0 to 1.

Table 2**.** Definition of variables

Dependent Variable
DEBT$_{i,t}$: Indebtedness of company$_i$ in period$_t$, calculated as the division between total debt and total net assets. Source: SABI.
Variables related to operational factors
BRAND$_{i,t}$: Brand of the hotel, measured by the dummy variable that takes the value 1 when the company$_i$ in period$_t$ has hotel that is associated with a subsidiary brand of the hotel chain, and 0 otherwise (i.e. when it is an independent hotel). Source: RNT.
CAT$_{i,t}$: Average star ranking (rated from 1 to 5 stars) of the hotels associated to the company$_i$ in period$_t$. Source: RNT.
PROP$_{i,t}$: Dummy variable that takes the value 1 when the hotel building is owned by the company$_i$ in period$_t$, and 0 otherwise (i.e., the company operates the hotel by leasing the building in the form of an operating lease), as in Ning et al. (2021). Source: RNT.
REC$_{i,t}$: Years of economic and financial crisis in the country, measured through the dummy variable (as in Chen and Capener (2025) and Lin and Chen (2022), that takes the value 1 in the years related to the financial crisis (years 2011 to 2014, coinciding with the sovereign debt crisis with the foreign aid to the country) and to the economic crisis (year 2020, associated with the impacts of COVID-19), and 0 otherwise. Source: author's calculations.
Control Variables
NAC$_{i,t}$: Dummy variable that takes the value 1 when the nationality of the shareholder of the company$_i$ assets in period$_t$ is Portuguese, and 0 otherwise. Source: SABI.
DIM$_{i,t}$: company$_i$ size in period$_t$, measured with the logarithm of sales. The squared variable is also used as **DIM^2**. Source: SABI.
ROA$_{i,t}$: Companies operating return on company$_i$ assets in period$_t$. Source: SABI.
RISK$_{i,t}$: Risk of the company$_i$ assets in period$_t$, measured as the standard deviation of the companies historical operating company$_i$ in the last three years prior to the period$_t$, as per Matemilola et al. (2018). Source: SABI.
AGE$_{i,t}$: : Age of the company$_i$ in period$_t$, measured as the number of years from start-up to the period$_t$. Source: SABI.
CRES$_{i,t}$: Growth opportunities in the company$_i$ in period$_t$, measured as the sales growth rate, according to Mueller et al. (2021). Source: SABI.
TANG$_{i,t}$: Tangibility of the companies$_i$ asset in period$_t$, calculated as the division between fixed assets and total net assets, according to Mueller et al. (2021). Source: SABI.

Source: Own elaboration

This TOBIT estimation is also used since it takes into account the conditional probability of a threshold observation that characterizes the outcome variable (Amemiya, 1984), and

because the structure of our database does not allow us to use another or additional methods. Also, Gomes et al. (2023) and Silva and Gomes (2017) use both methods. Therefore, the TOBIT regression estimation procedure has the same specification. Table 2 shows the definition of variables.

IV. EMPIRICAL ANALYSIS

4.1 Descriptive statistics

The analysis begins with descriptive statistics. Table 3 shows that, in the BRAND variable, 33.6% of the hotels have an established brand, so most of the hotels studied are independent. The star rating of the hotel establishments studied presents an average of 3.29 stars in the observed establishments. Notably, 80.7% of the establishments are owned, so the building is shown in the company's balance sheet. Finally, 36.1% of the observations refer to periods of economic and financial crisis.

Table 3. Descriptive statistics

Variable	Average	Median	SD	Min	Max	Skewness	Kurtosis
CAT	3.29	3	0.973	0	5	-0.404	-0.266
ROA	0.040	0.024	0.129	-1.07	1.97	1.573	21.959
DEBT	53.4	55.1	26.7	0	100	-0.131	-1.049
RISK	5.46	1.3	29.2	0	1070	19.803	524.198
DIM	5.88	5.87	0.677	2.15	8.03	-0.040	0.498
AGE	26	22	17,2	1	125	1.528	3.441
CRES	1.11	0.038	44.6	-1	3100	61.052	3969.16
TANG	0.608	0.678	0.299	0	1	-0.553	-0.959
Variable	**Frequency**						
BRAND	33.6%					0.696	-1.516
NAC	99.3%					-11.809	139.141
PROP	80.7%					-1.556	0.423
REC	36.1%					0.578	-1.666

Source: Own elaboration.
Note: Variables defined in Table 2

The results show that the average debt ratio is 53.4%, with a standard deviation of 26.7%, suggesting a high company debt discrepancy between the hotel establishments analyzed. This average debt ratio is medium and similar to the findings for Portugal and Italy on Sensini (2020), Muller and Sensini (2021), and Matias et al (2018), which have values between 50,1% and 59%. The operating profitability of these companies averages 4.01% of net assets and a standard deviation of 12.9%. The level of risk of the companies measured in this sector is relatively low and has an average of 5.46. The standard deviation of risk is high, showing a range of 29.2 across firms, underlining the existence of outliers. The average age of the companies is 26 years. Sales growth has an average of 1.11 and a standard deviation of 44.6. Finally, considering the tangibility of assets, fixed assets represent, on average, about 60.8% of total net assets, with a standard deviation of 29.9%.

The variables ROA, RISK, and CRES have positive skewness and kurtosis, indicating a longer right tail and a deviation in peakness compared to a normal distribution. These seem

to have outliers. In order to avoid problems caused by outliers, the variables ROA, RISK, and CRES, due to their high Skewness and Kurtosis values, were winsorized. We employ winsorization on those variables, setting thresholds at 1 % for both ends, which means that the winsorization was done a 1% and 99% on those variables.

4.2 Correlation matrix

The correlation matrix is shown in Table 4. The strongest correlation is between Debt, size (DIM) and hotel star rating (CAT). Thus, based on our expectations, the size of the hotel companies seems to be highly correlated with hotel star rating. Also, the PROP and AGE variables have a positive correlation. In short, in general, these three variables always correlate significantly with each other. As predicted in the literature, there seems to be evidence of a positive relationship between debt and star rating, recessions, size, growth opportunities, and the tangibility of assets. The correlation between debt and brand, contrary to expectations, is positive but low. Thus, since brand hotels benefit from customer loyalty, licensing, and efficiency (Rao et al., 2004), allowing them to generate higher cash flows and profit margins (Aaker & Jacobson, 1994; O'Neill & Mattila, 2006). The remaining variables appear to correlate negatively with debt. The absence of multicollinearity is further analyzed using the VIF indicator (see the last column in Table 4). Since all the VIF indicators are lower than 10 – the highest value is 1,961 - it is verified that there are no collinearity problems in the model.

Table 4. Correlation matrix

DEBT	BRAND	CAT	NAC	PROP	REC	ROA	RISK	DIM	AGE	CRES	TANG		VIF
1	0,037**	0,163***	-0,008	-0,057***	0,031	-0,189***	0,066	0,067***	-0,267***	0,082**	0,173***	**DEBT**	-
	1	0,268***	-0,066***	-0,013	-0,009	0,021**	0,020	0,403***	-0,022*	0,009	-0,066***	**BRAND**	1,220
		1	-0,061***	0,028**	-0,014	-0,076***	0,013	0,587***	-0,073***	0,024*	0,125***	**CAT**	1,694
			1	0,059***	-0,004	-0,011***	0,010	-0,116***	-0,023*	0,001	0,032**	**NAC**	1,023
				1	0,003	-0,123***	-0,008	0,020*	0,181***	-0,003	0,317***	**PROP**	1,176
					1	-0,190***	0,002	-0,099***	0,007	0,002	0,011	**REC**	1,077
						1	0,006	0,143***	-0,031**	0,003	-0,248***	**ROA**	1,306
							1	-0,021*	-0,027**	0,003	0,003	**RISK**	1,023
								1	0,111***	0,015	-0,013	**DIM**	1,961
									1	-0,008	-0,085***	**AGE**	1,127
										1	0,005	**CRES**	1,161
											1	**TANG**	1,250

Source: Own elaboration

Notes: 1) This table presents the Pearson correlation coefficients for the variables used. 2) *** P-value < 0.001, ** P-value < 0.01, * P-value < 0.05. 3)The last column "VIF" means the Variance Inflation Factor, a measure for multicollinearity. 4) Variables defined in Table 2

4.3 Multivariate analysis

This subsection analyses the impact of operational factors on indebtedness (Table 5). The results from the estimation following OLS and TOBIT regressions are very similar, allowing us to confidently draw conclusions from the data. The regression shows that the BRAND variable has a negative relationship with debt, but is not statistically significant. Thus, hotel brands (franchise or independent) do not significantly impact the decision to seek financing, which aligns with the findings of the study by Li and Singal (2019).

Table 5. Impact of operational factors on indebtedness

	Expected Signal	OLS 1 Coefficient	OLS 2 Coefficient	TOBIT 1 Coefficient	TOBIT 2 Coefficient
Constant		0.431***	0.504***	0.430***	0.504***
		(10.35)	(14.38)	(10.34)	(14.38)
BRAND	-	−0.003	−0.004	−0.003	−0.004
		(−0.563)	(−0.715)	(−0.568)	(−0.720)
CAT	+	0.020***	0.020***	0.020***	0.020***
		(6.040)	(5.875)	(6.029)	(5.866)
PROP	+	−0.059***	−0.059***	−0.059***	−0.059***
		(−8.562)	(−8.593)	(−8.563)	(−8.595)
REC	+	0.008*	(0.008)	0.008	0,008
		(1.464)	(1.504)	(1.472)	(1.512)
NAC	-	−0.047	−0.045	−0.047	−0.045
		(−1.501)	(−1.437)	(−1.500)	(−1.436)
DIM|DIM²	+	0.026***	0.002***	0.026***	0,002***
		(5.073)	(5.271)	(5,101)	(5.296)
ROA	-	−0.538***	−0.538***	−0.538***	−0.538***
		(−18.85)	(−18.88)	(−18.86)	(−18,90)
RISK	-	0.002***	0.002***	0.002***	0.002***
		(4.399)	(4.377)	(4.403)	(4.381)
AGE	-	−0.003***	−0.003***	−0.003***	−0.003***
		(−19.23)	(−19.27)	(−19.25)	(−19.30)
CRES	+	0.077***	0.077***	0.077***	0.077***
		(10.30)	(10.35)	(10.30)	(10.35)
TANG	+	0.105***	0.105***	0.104***	0.105***
		(11.16)	(11.22)	(11.15)	(11.21)
n		9842	9842	9842	9842
R^2 Adjust		0.1327	0.1329		
F(n,k)		137.933***	138.147***		
Sigma				0.249***	0.284***
Log Likelihood				262.778	261.769
Schwarz Criterion				645.083	643.066

Source: Own elaboration

Notes: 1) This table presents the OLS estimation results corrected using robust standard errors for heteroscedasticity with the White test, and TOBIT estimation results, for the dependent variable debt. OLS 1 and TOBIT 1 models consider the variable DIM. OLS 2 and TOBIT 2 models consider the variable DIM^2. 2) *** P-value < 0.01, ** P-value < 0.05, * P-value < 0.10. 3) The values *t* and *z* are shown in parentheses. 4) Variables defined in Table 2.

The star rating variable (CAT) shows a positive relationship with debt, which aligns with the findings of Santos et al. (2021) and Dalci et al. (2019). In contrast to expectations, the PROP variable exhibits a statistically significant negative relationship with debt. Thus, the Portuguese companies in the hospitality sector don't seem to be adopting an asset-light strategy (Li & Singal, 2019; Poretti & Heo, 2022). This finding may be related to the older companies that own buildings with lower levels related to it. This will be further analyzed in the following subsection.

Considering the relevance of financial and economic crisis periods in the hotel industry, we choose to analyze the behavior of these companies to strengthen our previous findings. In this sense, it is possible to observe a positive relationship between periods of crisis (variable REC) and the debt of the hotel companies studied in Portugal. Although we did not find other studies addressing the impact of crisis periods on the debt of hotel company establishments in Portugal, our findings align with our initial expectations. Thus, during periods of financial and economic crisis in Portugal, the debt of hotel companies tends to increase.

About the financial and control variables used, the results are as expected. The NAC variable shows that hospitality companies with international shareholders have more debt than those with domestic shareholders. The variable DIM is positively related to debt, aligning with the findings of Matemilola et al. (2018), Vieira and Novo (2010), and Serrasqueiro and Nunes (2014). This suggests that larger companies in the hotel sector tend to have higher debt levels. Additionally, Models (2) and (4) include a quadratic term in the model specification (DIM^2) to examine whether the relationship between size and debt is nonlinear, potentially exhibiting a U-shaped or an inverted U-shape. The results indicate that this quadratic variable is positively related to debt, which means that the size does follow a quadratic relation with debt. As size increases, size has a negative effect on debt up to a critical point, after which the influence of size on debt becomes positive.

When analyzing ROA, a statistically significant negative relationship with debt is observed, as in the studies of Mueller et al. (2021) and Pacheco and Tavares (2017). This finding supports the Pecking Order theory, which suggest that companies with higher profitability tend to have lower levels of debt. The variable RISK evidence a positive relationship with debt, which is unexpected. Thus, the higher the risk associated with hotels, the higher their level of debt. However, this result agrees with the results of Vieira and Novo (2010) and Pacheco and Tavares (2017). The first justifies this positive relationship with the fact that the relationship between insolvency costs and the level of financing is dynamic, which may indicate the presence of low insolvency costs. Thus, riskier firms that have more debt may see their agency costs reduced and likely outweigh the expected increase in bankruptcy costs. The later found a similar result which they explain that riskier firms continue to be financed by lenders to avoid bankruptcy and the losses implied by bankruptcy costs. The AGE variable is negatively related to debt, corroborating the literature and the results of Mueller el al. (2021) and Vieira and Novo (2010). It also supports the Pecking Order theory. There is statistical evidence that the older the firm, the lower its level of debt. As expected, the growth opportunities variable (CRES) is statistically positively related to debt, corroborating the findings of Mueller et al. (2021), and supporting the Pecking Order theory. There is statistical evidence that the higher the growth opportunities for Portuguese companies in the hotel sector, the higher level of debt. Finally, TANG variable is also positively related to debt, aligning with the results of Matemilola et al. (2018), and supporting the Pecking Order theory. Thus, it

is evidenced that the higher the tangibility of hotel companies in Portugal, the higher their level of debt since tangible assets serve as a real collateral for creditor banks.

The coefficient of determination shows that the independent variables explain around 15% to 17% of the debt, so other factors could help explain the indebtedness of companies in the hotel sector. For example, it could also include variables like ownership, auditors, and ESG ranking.

4.4. Robustness Analysis

The level of debt for companies is closely linked to their investment needs, and since companies in the hotel sector are expected to incur in large capital expenditures, the age of companies - associated with their investment needs - can be a relevant factor in terms of indebtedness. Therefore, Fortes et al. (2024) show that the age of companies in the hotel sector is negatively associated with investment, which means that younger companies have higher capital expenditure. Based on the idea that younger companies may need more cash flow to follow asset investment strategies, the database was restricted to the younger companies to understand if they require more debt than the older hotel companies. Table 6 shows the estimation results.

The results are consistent with those found in the previous sub-section. However, the younger companies associated with a hotel chain brand have a negative relationship with debt. This effect is related to the brand-affiliated hotels having lower cash flow risk (Liu and Neill, 2023). Brand hotels may have advantages related to customer loyalty, brand extensions like licensing, and improved efficiency (Rao, Agarwal, & Dahlhoff, 2004), which allows them to generate higher cash flows with higher profit margins (Aaker & Jacobson, 1994; O'Neill & Mattila, 2006). Based on this, it is expected that these brand-affiliated hotels require lower debt.

Regarding the PROP variable, the estimation results shows that younger companies with the hotel buildings as part of their assets have higher debt. This suggest that hotel companies that engage in greater capital expenditure are associated with higher debt levels (Lee et al., 2015; Li & Singal, 2019; Poretti & Heo, 2022).

Table 6. Impact of operational factors on indebtedness- Young companies

	Expected Signal	OLS 1 Coefficient	OLS 2 Coefficient	TOBIT 1 Coefficient	TOBIT 2 Coefficient
Constant		0.665***	0,768***	0.517***	0,657***
		(6.731)	(8.953)	(5.873)	(8.459)
BRAND	-	−0.032***	−0.034***	−0.029**	−0.031**
		(−2.681)	(−2.764)	(−2.311)	(−2.396)
CAT	+	0.012*	0.011*	0.009	0.009
		(1.958)	(1.753)	(1.282)	(1.214)
PROP	+	0.036***	(0.035)**	0.025*	0.024*
		(2.634)	(2.547)	(1.714)	(1.651)
REC	+	0.027**	0.027**	0.022*	0.022*
		(2.268)	(2.245)	(1.698)	(1.759)
NAC	-	−0.158*	−0.159**	−0.076	−0.075
		(−1.955)	(−2.042)	(−1.091)	(−1.080)
DIM|DIM²	+	0.035***	0.003***	0.050***	0.004***
		(3.472)	(3.696)	(4.846)	(4.836)
ROA	-	−0.530***	−0.529***	−0.545***	−0.543
		(−10.760)	(−10.68)	(−9.615)	(−9.587)
RISK	-	0.000	−0.000	−0.000	−0.000
		(0.001)	(−0.223)	(−0.640)	(−0.656)
AGE	-	−0.017***	−0.017***	−0.020***	−0,020***
		(−6.900)	(−6.945)	(−7.504)	(−7.465)
CRES	+	0.023*	0.024*	0.025*	0.022*
		(1.892)	(1.933)	(1.938)	(1.759)
TANG	+	0.057***	0,062***	0.094***	0,096***
		(2.630)	(2.808)	(4.227)	(4.314)
n		1563	1563	1563	1563
R^2 Adjust		0.1763	0.1767		
F(n,k)		31.387***	31.467***		
Sigma				0.226***	0.226***
Log Likelihood				107.760	107.138
Schwarz Criterion				−118,760	118.669

Source: Own elaboration

Notes: 1) This table presents the OLS estimation results corrected using robust standard errors for heteroscedasticity with the White test and TOBIT estimation results, for the dependent variable debt, and considering only companies that are 10 years old or less. OLS 1 and TOBIT 1 models consider the variable DIM. OLS 2 and TOBIT 2 models consider the variable DIM^2. 2) *** P-value < 0.01, ** P-value < 0.05, * P-value < 0.10. 3) The values *t* and *z* are shown in parentheses. 4) Variables defined in Table 2.

4.5. Discussion of the results

The results of the empirical analysis allow us to confirm some of the research hypotheses. The first research hypothesis suggest a negative relationship between brand and debt, but this was not validated across the entire sample. Although there is a negative relationship between the brand and debt, it is not statistically significant. Thus, for the Portuguese context and in line with what Li and Singal (2019) have argued, the results do not allow us to say that companies sharing a brand tend to have less debt. One contributing factor to these findings is that only 33.6% of the companies in the study shared a hotel brand.

However, when focusing solely on companies that are 10 years old or younger, the coefficient of the BRAND variable remains negative and is statistically significant at 5%. The first research hypothesis is partially validated. Although it is not confirmed for all companies, the results support the research hypothesis for younger companies. The second research hypothesis suggest a positive relationship between star rating of a hotel and its debt, whose results were validated. It is then possible to conclude that the higher the hotel star rating, the higher is its debt level. These results support the conclusions of Santos et al.'s (2021) study, which suggests that the number of stars is the most significant factor influencing the liquidity of hotel companies operating in Portugal. This liquidity is negatively influenced by the level of debt, as discussed by Dalci et al. (2019). This research hypothesis is confirmed. The third research hypothesis suggest a positive relationship between hotel ownership and debt. The results showed a negative relationship, which was unexpected. When a company operates a hotel where the building is owned by them, its level of debt seems to be lower, contrary to what was argued by Li and Singal (2019) and Poretti and Heo (2022).This result may be linked to the fact that 80.7% of the companies own their establishments and have an average age of 26 years, which means that these companies will make fewer investments after the initial investments with the acquisition/construction of the building. On the one hand, the PROP variable shows a positive correlation (18,1%) with the AGE variable and, on the other hand, the DEBT variable shows a negative correlation (26,7%) with the AGE variable. So, the Portuguese older companies doesn't seem to adopt an asset-light strategy, but the younger companies may be following this strategy. If we consider only companies with 10 years old or less were considered, the coefficient of the PROP variable becomes positive and statistically significant at 5%. The research hypothesis is only validated for younger companies.

Finally, the research hypothesis on the relationship between financial and economic crisis periods and debt was also studied. The results provide evidence of a positive relationship between these aspects. In this sense, in periods of financial or economic crisis, the level of the company's debt in the hotel industry tends to be higher.

V.CONCLUSION

The main objective of this study was to analyze the factors that most contribute to the debt of Portuguese companies in the hospitality sector, focusing on the operational aspects. The study also aimed to understand how periods of financial and economic crisis affect the debt of companies within this sector.

The analysis of data collected from the SABI and RNT databases between the years 2005 and 2020 for companies in the hotel sector revealed not only the preponderance of financial conditions of the companies related to debt but also highlight the importance of operational factors for hotels managed or operated by Portuguese companies.

The results demonstrate that the factors contributing to debt are the star rating, hotel ownership and crisis period. It is also possible to conclude a positive relationship between debt and periods of crisis, which supports the objective of the study. Companies that operate hotels affiliated with a brand, especially younger ones, have lower debt and are more likely not to own the hotel properties. This aligns with a strategy focused on investing in technology and loyalty through franchising agreements, as well as adopting an asset-light strategy.

The scarcity of literature on factors that affect the level of debt leads this study to have some important theoretical implications, as it is one of the first to connect variables related to the operational activity of the hotel business with debt. With this research, the knowledge about the debt of companies with hotel establishments becomes more refined.

This study also has important practical implications, providing valuable information for managers and investors, particularly regarding investment decisions related to brand, star rating and hotel ownership. Therefore, and on the one hand, for new investors or companies entering in this sector that do not wish to resort to high levels of debt or have limited access to bank financing, they should adopt a strategy of sharing a brand with other hotels. These hotels should not have a very high star rating and should prioritize renting the property where the hotel operates rather than owning it. On the other hand, existing companies that own the properties where the hotels operate can sell them and sign an operating lease, thereby reducing their debt and directing these resources toward investing in more technology and customer loyalty, cutting down on your operational risk and increasing the value of the company, as noted by Li and Singal (2019). If existing companies do not yet share a brand for their hotels, they can do so at any time, as this generally leads to better economic and financial performance (Martins et al., 2021) and reduces the need to make large investments to increase brand recognition, thereby also reducing debt. This is because the lower the level of indebtedness of companies, the fewer difficulties they tend to experience in periods of economic or financial crisis (Poretti & Heo, 2022).

The main limitations are related to the difficulty in obtaining and processing the non-financial data, as well as the difficulty in matching the databases. It should also be noted that despite the data being taken directly from the SABI and RNT platforms, many observations were not included due to missing values of some variables in several years. Although this study uses two estimation methods, our empirical approach does not fully eliminate endogeneity issues. Therefore, our results are not entirely causal. Additionally, it's important to mention that instrumental variable approaches could help address endogeneity, but unfortunately, we do not have access to them in our dataset. As a suggestion for future work, an extension to an international level is suggested, considering that the exploration of the subject is still at an early stage. It would also be interesting to analyze the debt of zombie companies. Additionally, it would be interesting to study the importance of corporate governance factors for debt

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