

# AN INDEX FOR MEASURING HORIZONTAL DIFFERENTIATION IN HOSPITALITY

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**Abstract:** *Amid a continuous and evolving offer of new services, the hospitality industry is immersed in a highly competitive changing environment, being differentiation an essential strategy to survive and gain a competitive advantage. As a consequence, a differentiation strategy is continuously being defined and adapted. Beyond the vertical differentiation, focused on objective quality signals, horizontal differentiation offers more chance and alternatives to hoteliers for using own resources and capabilities to gain a competitive advantage. In particular, product analysis and competition evaluation are a must-be to offer a value proposition co-created with the customer. Considering the great range of services, and the need to compute all properly and understandably, this work aims to design and index that can integrate all services of a hotel and allow comparison to evaluate the level of differentiation.*

**Keywords:** *Hospitality, Hotels, Horizontal differentiation, Differentiation index.*

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## 1. INTRODUCTION

Nowadays, the activity of tourism companies is immersed in continuous change because the environment moves at high speed, where tourism managers have to redesign their roadmap and define new strategies to follow, in order to lead and motivate all members of the hotel in front of the change, and to be able to ensure the correct performance and not exit from the market where they usually operate.

Hotels have to innovate continuously and not get stuck in the way they work and reach their target audience. This innovation must begin with the strategic ability to anticipate changes and achieve new opportunities in the tourism sector, generating an effort to achieve a different result. Hotels must design their value proposition by co-creating with their target and thus create the best process, image and product or services most successful.

Hotels have to take advantage of the information generated by their clients to create the best strategy to follow and thus be able to achieve the best results.

Among the strategies that a hotel can adopt are differentiation strategies, and in the tourism context these strategies have been approached through the distinction of vertical and horizontal differentiation, the first of which has been most analyzed by hotel research. Fundamentally, previous studies have addressed the analysis of vertical research strategies through the official hotel category, since this is a quality signal widely used by consumers. However, the hotel industry is traditionally considered as a sector with information asymmetries and although the official hotel classification is

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considered an indicator of standard quality, its validity as a signal of absolute quality for the consumer has been questioned, requiring mechanisms of additional information (Abrate et al., 2011; Akerlof, 1970); various reasons question its validity, such as the fact of the coexistence of different classification systems due to the various local and national regulations (Martin-Fuentes, 2018; UNTWO 2015), the superposition of adjacent categories (Nuñez-Serrano et al., 2014), the lack of correspondence between quality and hotel categories (López-Fernández & Serrano-Bedia, 2004).

For these reasons, hoteliers can use other types of strategies based on horizontal differentiation, for which it is essential to have an indicator that allows hotel managers to analyze the services offered by the competition. However, the analysis of these strategies has been addressed to a lesser extent by previous studies. This may be due to the existence of a wide variety of services offered within the hotel sector (Dube & Renaghan, 2000) that makes it difficult to measure the degree of differentiation of a hotel with respect to the competition. Fundamentally, chain membership or individual availability of services have been used as indicators of the degree of differentiation, which do not take into account the offer of services from the competition. Few studies have considered alternative measurements that do take into account the competition (Urtasun & Gutiérrez, 2017). Additionally, the development of an indicator of horizontal differentiation improves the consumer's purchasing decision-making process compared to the available offer and allows a better comparison by the consumer of the hotel price based on the services offered.

In this chapter we focus on the horizontal differentiation strategy as a competitive decision involved in providing better value to customers. In a highly competitive environment, most differentiated companies will be able to enjoy greater market power, allowing them to set higher prices (Carlton & Perloff, 2005) due to their higher value based on designing a unique value proposition. Considering hoteliers can offer a wide and diverse range of services, and extant literature offer a limited operationalization for this strategy (Silva 2015; Urtasun & Gutierrez 2017), present work develops a horizontal differentiation index for application in each service establishment of the hospitality industry. This index can be adapted to different context and organization, making comparisons with nearby establishments and find out differences and profiles.

One key innovation of this index is that is based on the geolocation of hotels for a more efficient and precise analysis of the competition based on the commercial area where the establishment is located. This proposal is intended to provide several contributions:

Firstly, our proposal can add the main approaches when horizontal differentiation is measuring, thus taking into account all the fundamental elements when establishing a horizontal differentiation strategy and being able to evaluate it globally with respect to the competition, surpassing thus the limitations of conventional methods to measure horizontal differentiation.

Secondly, from a business perspective, the problem of information overload has increased exponentially (Edmunds & Morris 2000, Leeflang et al. 2014), as companies obtain different types of data (such as those related to social media, location, web traffic and clickstream) at different points in the value chain (Brown et al., 2014), being a demand to seek solutions that make it possible to take advantage of the abundance of information available to the company and generate unique knowledge for the organizational competitiveness of companies (Brown et al., 2014, Day, 2011). In this sense, our proposal aims to facilitate access to good market coverage and focus on the most successful strategy to reach potential customers (Rondán-Cataluña & Rosa-Díaz, 2014) by aggregating the information available on the hotel offer of the competition.

From the consumer's point of view, the overload of information, due to the wide hotel offer available today (Dube & Renaghan, 2000), can generate a feeling of overwhelm (Bawden & Robinson, 2009, Savolainen, 2007, Savolainen, 2015) and can generate a greater time in making decisions, lower quality of decision and lower confidence in the decision (Chervany & Dickson, 1974). Additionally, if the information load exceeds a threshold, consumer confidence and purchase intention are negatively affected (Furner & Zinko, 2017). In this sense, an easily interpreted horizontal differentiation indicator can, from the consumer's perspective, facilitate the purchasing decision-making process in relation to the available offer, and allow a better comparison by the consumer of the hotel price based on the services offered.

Finally, obtaining an aggregate index of horizontal differentiation with respect to the competition is of interest from the strategic perspective of the company, since, like differentiation strategies, conformity strategies also have theoretical support that supports the idea that similarity with respect to competing companies may be associated with benefits (Boulding, 1966; Eaton & Lipsey, 1975) and that it has empirical support within the hotel sector (Lee & Jang, 2015). Furthermore, from a strategic management point of view, it has been suggested that the optimal strategy of a company should consider a mix of differentiation and conformity (Deephouse, 1999; Irmen & Thisse, 1998), this assumption having been verified empirically in the hotel industry (Kim et al., 2020); but, due to the high number of attributes within the hotel context, a few is known about what degree of differentiation should be adopted within a mixed strategy. Thus, within the hotel strategy, having an index that measures the degree of horizontal differentiation with respect to the competition will make it possible to evaluate in a more efficient way what is the optimal degree of differentiation that a hotel should adopt to increase its performance.

## **2. VERTICAL VS. HORIZONTAL DIFFERENTIATION STRATEGIES IN THE HOSPITALITY INDUSTRY**

### **2.1. Theoretical underpinnings for building a horizontal differentiation index in hospitality**

Three main theoretical views about the concept of strategy can be identified in the literature, that is, Porter's Competitive Advantage (Porter, 1985), the Resource-Based View (RBV) (Barney, 1991), an approach based on the heterogeneity of resources necessary to achieve a competitive advantage based on the theory of resources and capabilities (Barney, 1991; Peteraf, 1993), that consists of estimating the difference or similarity between the strategy or resources of a company and those of its industry (Deephouse, 1999). According to Porter (1985), a generic differentiation strategy consists of finding a unique attribute that is valuable to the customer and could provide an external competitive advantage. However, from an economic perspective, with the aim of structuring industries, two models of product differentiation have emerged based on what the product captures, i.e. its quality versus its quantities (Makadok & Ross, 2013). We distinguish between vertical and horizontal differences (Beath & Katsoulacos, 1991). Vertical differences are understood to mean that all products are offered at similar prices and the consumer will choose the product with the best performance. On the other hand, if the products are offered at different prices, the higher quality product will be the one with the highest price (Waterson, 1989).

Horizontal differentiation is based on the heterogeneity of consumer preferences regarding the desirable characteristics of a product or service, which means that each consumer acquires the product or service that best suits their specific preferences, being different from the preferenc-

es of another consumer when the price of the product is the same (Cremer & Thisse, 1991). Through horizontal differentiation, a company seeks a specific market share through a greater adaptation than the competition to the specific preferences of a part of the consumers. It aims to measure the extent to which the products offered are more attractive to certain consumers (Silva, 2015) and evaluate the best strategy based on nearby competing establishments (Urtasun & Gutiérrez, 2017).

In the hospitality context, vertical differentiation has been analyzed through the hotel category as an indicator of quality signal (Pawlicz & Napiella, 2017; Silva, 2015) or through similar indicators (Lee, 2015), where they implicitly adopted the assumptions of the Signaling Theory (Spence, 1973), serving the tourist to opt for one hotel or another. In addition, the hotel category is one of the most analyzed factors in hedonic price models, generating a positive effect on it (Becerra et al., 2013; Bull, 1994; Israel, 2002; Zhang et al., 2011) being the essential explanatory variable of room price (Bull, 1994; Israeli, 2002), and even the factor with the greatest impact on price (Espinet et al., 2002; Zhang et al., 2011). Additionally, the star category of a hotel is positively related to other factors of hotel quality, such as physical standards of the hotel or affiliation to quality assurance programs (Abrate et al., 2011). Finally, comment on how the hotel category is used by potential clients based on their needs and preferences so that they can choose the hotel that best suits them (Masiero et al., 2015). Extant hospitality research supports the reducing effect of vertical differentiation on pricing competition (Becerra et al., 2013; Israeli, 2002; Lee, 2015). However, it is an asymmetric effect depending on the quality of the establishment (Lee & Jang, 2013).

Differentiation strategies have found support from various theoretical currents (Barney, 1991; Chamberlin, 1933; Carlton & Perloff, 2005; Porter, 1991) that postulate that a more differentiated company can increase its performance.

However, the category has limitations to differentiate the hotels in terms of quality and explain the price. Thus, Abrate et al. (2011) conclude that “The lodging accommodation classification needs updating given the relevance of quality assurance programs to explain pricing. New criteria should evaluate intangible aspects related to service quality and managerial efforts to reduce the environmental impact associated with their operations” (p. 920). In addition, there may be heterogeneity caused by different local and national regulations (Martin-Fuentes, 2018; UNTWO, 2015), with great difficulty in characterizing the offer of the hotel establishments due to the great diversity of services and differences in economic development between countries. Thus, similar hotel categories between countries may correspond to different services. There is also an overlap in quality between adjacent categories (Nuñez-Serrano et al., 2014), and no correspondence between classification by quality/classification by categories (López-Fernández & Serrano-Bedia, 2004). Extant differentiation literature has passed over this informational limitation. For these reasons, hoteliers can employ other types of strategies based on horizontal differentiation.

## **2.2. Measurement of horizontal differentiation in the hospitality literature**

The research focused on the hospitality industry, shown as limitations at the methodological level for the measurement of differentiation, basically approached from the three standpoints: geographic location with respect to points of interest (Ivanov & Piddubna, 2016; Latinopoulos, 2018; Lee & Jang 2013; Soler et al., 2019); the link to the chain (Becerra et al., 2013) and the offer of services and amenities (Espinet et al., 2003; Yang et al., 2016).

Concerning the first approach, geographic differentiation is mainly linked to especially important location decisions, and long-term decisions given the high relocation costs of the hotel industry (Baun & Haverman, 1997), being insufficient to adequately characterize the entire hotel differentiation strategy.

On the other hand, chain affiliation is the most widely considered approach, despite its limitations as an indicator of horizontal differentiation, since there are variations in service quality (Antony et al., 2004); the customer may perceive differences in the service received between hotels of the same chain (Sun et al., 2017) and the reduction of asymmetry of information regarding the consumer due to the proliferation of electronic Word of Mouth and Online rankings in the hotel sector (Masiero & Nicolau, 2016) has caused its deterioration as a sign of differentiation (Hollenbeck, 2018), being partially replaced, so that there are divergences in its impact on the room price.

Thus, there are previous studies (Balaguer & Pernias, 2013; Becerra et al., 2013; Ivanov & Piddubna, 2016) that conclude that belonging to a chain allows increasing the room rate; other studies concluded that its effect is not significant (Baldassin et al., 2017; Hung et al., 2010; Israel, 2002; Pawlicz & Napierala, 2017) and finally Soler et al. (2019) found that such linkage had a negative effect.

Another methodological alternative to analyze the effect of horizontal differentiation on price is to forecast the individual effect of each infrastructure or service offered by the hotel. This alternative also has limitations, one of them being the wide variety of attributes considered by consumers in choosing a hotel (Dube & Renaghan, 2000) and through which a hotel can differentiate itself. This high number of available services can generate inconveniences since the most common form of incorporation in hedonic models has been through the incorporation of dummy variables associated with the corresponding services, which at a methodological level, can generate multicollinearity with the hotel category (Pawlicz & Napierala, 2017). In addition, like chain membership, there is a diversity of results on the same service depending on the destination analyzed (Baldassin et al., 2017; Latinopoulos, 2018; Lee & Jang, 2011; Yang et al., 2016).

Finally, the main limitation of the three previous approaches is that they do not measure the level of differentiation with respect to the competition, so they do not take into account the value that the consumer receives compared to the value offered by rival products, so that the aggregate measurement of the differentiation in services of a hotel with respect to the competition through a service indicator has been considered to a lesser extent by previous studies (Silva, 2015; Sánchez-Pérez et al., 2020; Urtasun & Gutiérrez, 2017); the indicators proposed in the approach of Urtasun & Gutiérrez (2017) are complex and the interpretation of their value can be not very intuitive when evaluating the degree of differentiation of a company for hotel managers and the consumer, while the indicator proposed by Silva (2015) may increase its value as it incorporates a greater number of services, which can generate confusion when evaluating the degree of differentiation of a hotel. In this way, in this chapter, we will adopt an aggregate measurement approach through an indicator of easy interpretation of its value for both the consumer and the company that allows us to know the differentiation in services, with respect to the hotels of the competition, and to truly know the uniqueness of each hotel.



### 3. OPERATIONALIZATION OF AN HORIZONTAL DIFFERENTIATION INDEX IN THE HOTEL INDUSTRY

Once all relevant theoretical concepts have been identified, the development of the differentiation index was developed through three different stages: data collection, data geolocation and index calculation.

**Data collection stage.** We use as an empirical setting the Spanish hotel industry, due to its size and width (Deloitte, 2018). First, a dynamic online system was developed that allowed data to be obtained from hospitality websites. This monitoring system allows you to constantly update the service offer of each establishment. The data sources used were mainly the websites of establishments with information on their activity, as well as websites of tourist intermediaries. To achieve the autonomous monitoring system, we will use tools such as R software through packages such as RCrawler (Khalil & Fakir, 2017), as well as other similar tools for tracking and data extraction on the Internet. As a result of this first phase, information was obtained on the services offered by each hotel (Table 1), various attributes of each establishment (category, age, size), room prices, and location data (GPS coordinates).

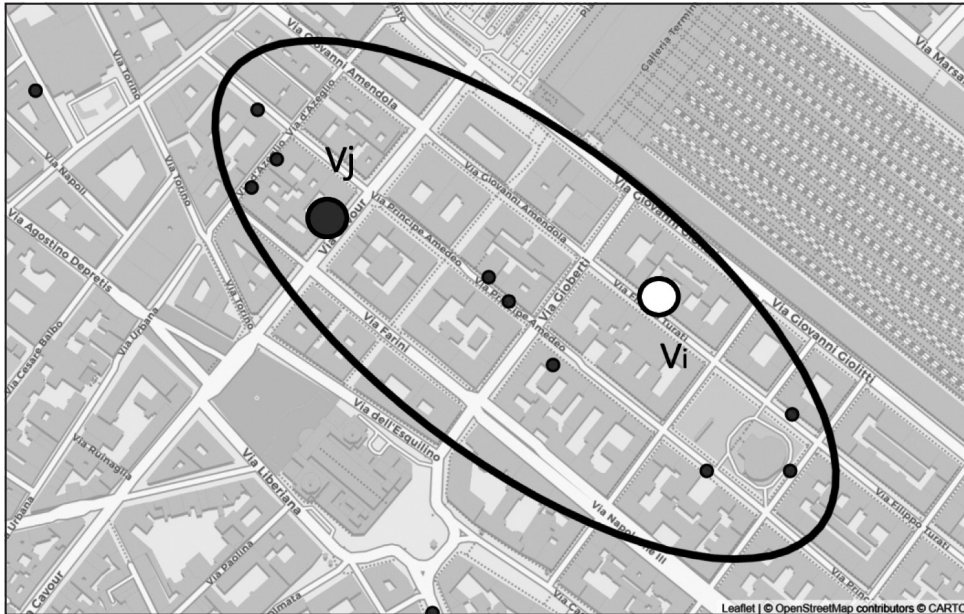
**Geolocation stage.** Based on the GPS coordinates of each establishment obtained in the previous stage, each establishment was geolocated using routines programmed in R based on the „geosphere” and „ggmap” packages. To determine the competing establishments of each hotel, the commercial areas defined by a wholesale travel agency were considered as areas of geographic competence (Balaguer & Pernías, 2013). Given that hotels with the same category, located in the same commercial area, are considered vertically homogeneous, in addition to obtaining the number of hotels in each commercial area, we calculate the total number of hotels with the same category for each commercial area and for all hotel categories.

**Calculation of the horizontal differentiation index.** For each hotel establishment  $i$ , the horizontal distance in services with respect to the competition in its commercial area was measured. For this, each hotel establishment  $i$  was characterized through a vector of services  $V_i$  formed with 99 dummy variables (see Table 1) that each represent whether the corresponding service is available at hotel  $i$ . These dummy variables have been weighted so that those relevant services in the Italian context, like services related to the Italian historical and cultural context (Cucculelli & Goffi, 2016; Manrai et al., 2017; Presutti et al., 2015), have been weighted by 2, and other services related to sun and beach tourism have been weighted by 1/2. For the rest of the services we have used the unit as weighting (Table 1). Given another hotel in the same shopping area  $A_i$  represented by the vector  $V_j$ , to measure the distance between their respective service vectors (Figure 1) we consider a distance used in the product differentiation research (Chisholm et al., 2010) given by:

$$Dif_{ij} = \left( \cos^{-1} \frac{V_i \cdot V_j}{\|V_i\| \cdot \|V_j\|} \right) / \left( \frac{\pi}{2} \right)$$

**Table 1.** Summary of hospitality services offered and weights

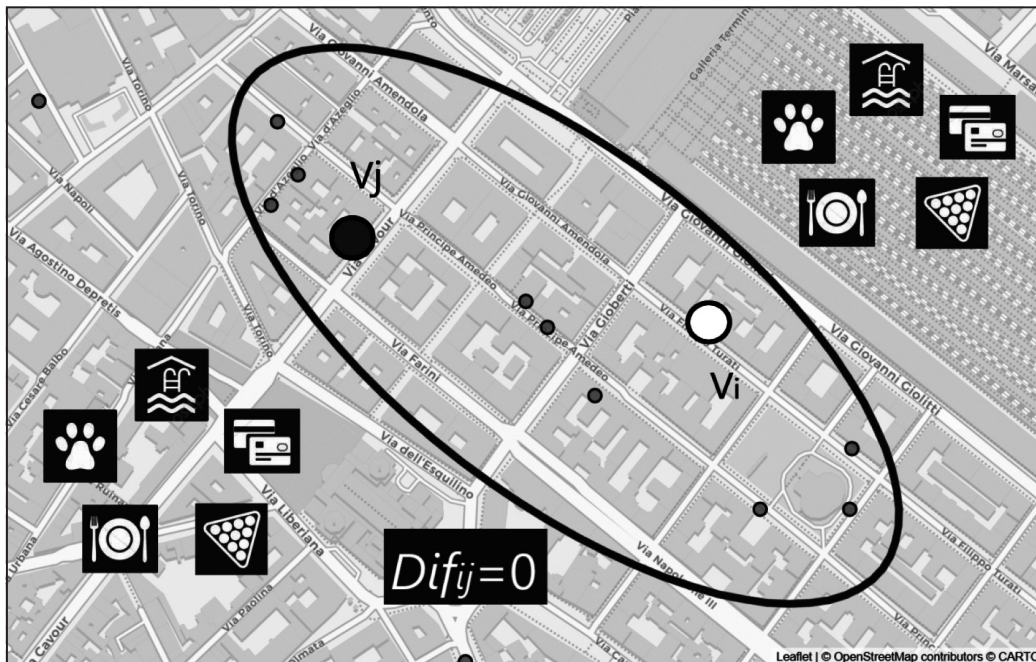
<b>Sport</b>	<b>Meals</b>
Aerobics (1)	Accommodation Breakfast buffet lunch (1)
Animation activities (1)	Average board no drink (1)
Aquatic gymnastics (1/2)	Bed and breakfast (1)
Archery (1)	Breakfast (1)
Badminton (1)	Breakfast buffet (1)
Basketball (1)	Brunch (1)
Mountain biking (1)	Buffet dinner (1)
Billiard - American or Russian (1)	Buffet lunch (1)
Bowling (1)	Continental breakfast (1)
Children's animation (1)	Diet food (1)
Darts (1)	Dinner (1)
Diving (1/2)	Dinner a la carte (1)
Golf (1)	Dinner from menu to choose (1)
Gymnastics (1)	Dinner type buffet (1)
Handball (1)	Drink included (1)
Hiking (1)	Half board (1)
Horse riding (1)	Lunch (1)
Jet sky (1/2)	Lunch a la carte (1)
Mini golf (1)	Lunch from menu to choose (1)
Paddle (1)	Menu a la carte (1)
Petanque (1)	Menu lunch (1)
Ping pong (1)	
Sailing (1/2)	
Squash (1)	
Surf (1/2)	
Tennis (1)	
Table tennis (1)	
Volleyball (1)	
Water ski (1/2)	
Windsurf (1/2)	
<b>Credit card</b>	<b>Entertainment</b>
American express (1)	Business (1)
Diner (1)	Cultural (2)
Diner club (1)	Design (2)
Electronic cash (1)	Ecological (1)
Electronic cash card (1)	Holiday complex (1)
Japan credit bureau (1)	Ideas for family (1)
Maestro (1)	Meeting (1)
MasterCard (1)	Romantic (2)
Visa (1)	Sky (2)
Visa card (1)	Spa (1)
Visa electron (1)	Thematic (2)
	Casino (2)
<b>Other services</b>	
Non-smoking rooms (1)	Flexible entry and exit (1)
Adapted for people with reduced mobility (1)	Quality toiletries (1)
Parking (1)	Free luggage storage (1)
Free WIFI (1)	Pets (1)
24-hours reception (1)	Common and co-working spaces (1)
High speed Internet (1)	Cooking classes, art, yoga (1)
Abundant plugs (1)	Cots (1)
Ironing board (1)	Laundry service (1)



**Figure 1.** Comparison of the services offered for two hotels:  $V_i$  and  $V_j$ .

**Source:** Own elaboration through the use of OpenStreetMap® and Contributors

The distance value ranges from 0 to 1. If the distance value is zero, the two hotels offer the same services and are not differentiated (Figure 2).

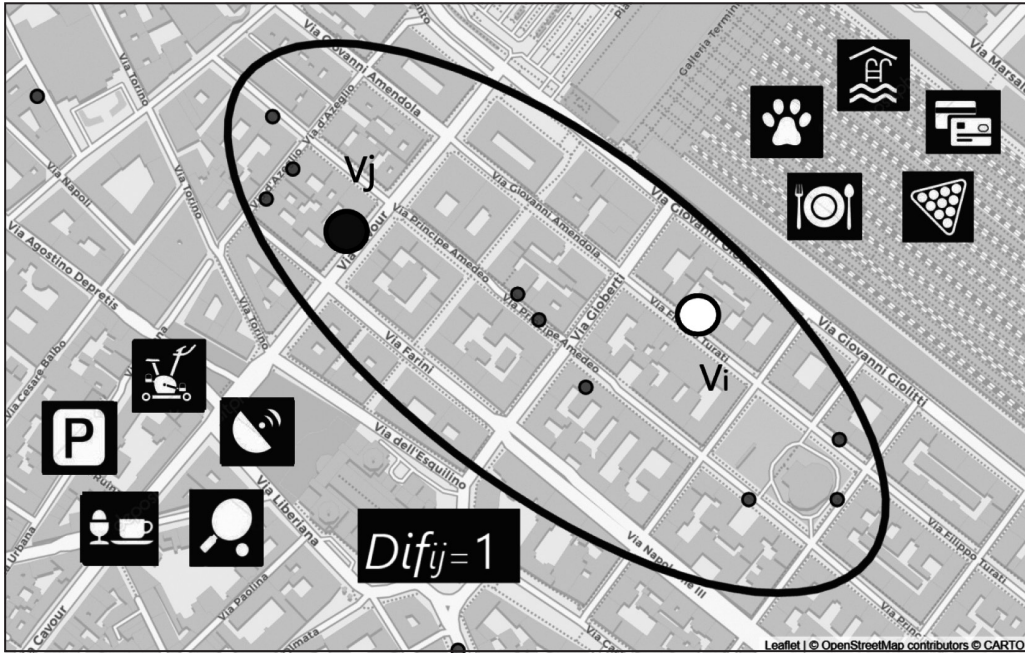


**Figure 2.** Case of hotels offering similar services but not differentiated

**Source:** Own elaboration through the use of OpenStreetMap® and Contributors

If the value of the distance is 1, the two hotels do not have overlap between the services offered by each one and they are totally differentiated (Figure 3).





**Figure 3.** Case of hotels offering different services / differentiated  
**Source:** Own elaboration through the use of OpenStreetMap® and Contributors

This operation is being repeated with the rest of the hotels in the commercial area (Figure 4).



**Figure 4.** Case of whole set of hotels in the same area  
**Source:** Own elaboration through the use of OpenStreetMap® and Contributors

Finally, the value of the horizontal differentiation index ( $H_{Dif}$ ) for the hotel considered is the minimum distance obtained with respect to the competitors in its area (Figure 5), thus capturing the unique value that the hotel contributes within its commercial area:

$$(H_{Dif})_i = \min_{j \in A_j} (Dif_{ij})$$



- ***H\_Dif***. As horizontal differentiation degree of hotels, we consider our proposal. It ranges from 0 to 1 to represent minimum horizontal differentiation and maximum horizontal differentiation respect to competitors.

Additionally, we consider the following control variables:

- ***Size***. Following Lee (2015) and Silva (2015), we controlled hotel size by the number of rooms because hotel size may affect hotel pricing.
- ***Age***. We controlled hotel age by the number of years of hotel operations to account for possible differences between new hotels and old hotels (Silva, 2015)
- ***Competitor***. Hotel's competition for each hotel is represented by the logarithm of the number of lodging establishments in the commercial area of the hotel (Becerra et al., 2013).
- ***Distance***. This variable account for the average distance of each hotel in kilometers, with respect to other hotels in its area (Becerra et al., 2013).

Specifically, we propose the following model to analyze the impact of vertical and horizontal differentiation on hotel price:

$$LNPrice_i = \beta_0 + \beta_1 \cdot Size + \beta_2 \cdot Age + \beta_3 \cdot Competitors + \beta_4 \cdot Distance + \beta_5 \cdot Category + \beta_6 \cdot H_{Dif} + \varepsilon_i$$

The proposed model was estimated with the sample of Italian hotel with OLS. Firstly, we analyzed the heteroscedasticity of the residuals using the Breusch-Pagan test whose results confirms the absence of heteroscedasticity in the residuals (p-value=0.133). Next, we analyzed the presence of multicollinearity with the variance inflation factor (VIF). For all explanatory variables, VIF values are below 2 (Table 2) and it confirms the absence of multicollinearity in the model. Finally, Table 2 shows the results obtained in the estimation of the proposed model with OLS.

**Table 2.** Model estimation with OLS

Variable	Coefficient	p-value	VIF
Intercept	2.589(9.556e-1)	0.007***	
Size	9.913e-4(3.985e-4)	0.013**	1.327
Age	-3.204e-5(4.724e-4)	0.946	1.036
Competitors	0.071(0.018)	1.280e-4***	1.914
Distance	-0.074(0.012)	1.11e-10***	1.186
Category	0.453(0.039)	2e-16***	1.291
H_Dif	0.208(0.097)	0.032**	1.774
F-statistic	41.27	2.2e-16***	
R <sup>2</sup>	0.477		

**Source:** Own elaboration

Results from Table 2 show that both vertical and horizontal differentiation have a significant positive impact on hotel price. Thus, the strategy based on horizontal differentiation in Italy has a positive impact and conformity strategies penalize hotel prices. Additionally, Table 2 provides the R<sup>2</sup> value. The value obtained indicates that the hotel price in Italy may be affected by other factors such as the valuation of the clients or the location of the hotel measured as the distance to the city center or distance to attractions.



#### 4. FUTURE RESEARCH DIRECTIONS

The information found on the Internet about the services and characteristics offered by the hotels could reach all domestic devices through the installation of a free application, and thus the consumer could be informed about the services offered by the hotels that might interest them the most at the moment of hiring, make a comparison quickly and make the most effective hiring. The range of services could be expanded through co-creation with stakeholders related to the hospitality sector and specifically with potential tourists, and thus be able to detect new potential services to offer. Another future research would be to analyze the hotel offer and the decision-making of hoteliers.

#### 5. CONCLUSION

The hospitality industry is characterized by a wide and varied offering, being difficult to make comparisons and evaluation. Considering this, this work offers an index whose statistical properties have been assessed, and practical application has been illustrated.

The design of this horizontal differentiation index lets hoteliers make faster and better decisions about services that will fit best in the profile of the tourist who visits them. In addition, it can be useful to carry out a market research of focal competition, and, thus it is able to detect what the competition is offering, how it is differentiating, what is adding value with respect to the focal establishment.

Finally, this indicator, flexible, easy to understand and use, will save time and minimize risks and thus it allows the consumer to feel safe and satisfied with the hotel contracted.

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