

The Journey from Supplier to End Customer: Exploring the Dynamics of Supply
Chain and Distribution Channels in the Hospitality Industry

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ABSTRACT

The hospitality industry is characterized by a close interdependence between retailers and suppliers. Retailers depend on suppliers to provide the necessary goods and services to operate effectively, while suppliers rely on retailers to buy and market their products. With intense competition in the industry, effective supplier selection has become a critical asset for companies. Traditional supply chain management approaches that focus solely on increasing economic value are insufficient in the face of growing pressure for socially and environmentally responsible business practices. As a result, new criteria, including environmental, social, political, and customer satisfaction considerations, have been added to the pre-existing factors in supplier selection. While restaurants strive to select suppliers who meet their quality, social, and environmental standards, these suppliers may still face internal issues such as food safety, ethical malpractice, environmental concerns, and human rights issues. When such issues arise, it is unclear whether customers hold restaurants accountable for the mistakes of their suppliers, even when the restaurant has not been directly involved in these issues. The first part of this dissertation aims to explore how consumers associate negative news about supplier food quality and practices with the restaurants they patronize. By doing so, this study contributes to a better understanding of the indirect link between supplier issues and restaurant market value.

On another note, Online Travel Agents (OTAs) play an important intermediary role in the two-sided travel distribution market. A critical factor that enhances a firm's competitive advantage

is innovation. Yet, the analysis of innovation in the OTA context is scarce. The main objective of the second part of this dissertation is to fill this gap and examine the effect of OTA innovations on firm performance. We analyze the effect of two-sided market specific innovations (same-side and cross-side) on performance and contribute to the literature by expanding the theoretical understanding of innovations. We find that producer-to-consumer innovations have a greater effect on OTA performance than producer-to-producer and consumer-to-consumer innovations. A fundamental managerial implication is that exchange management is an area to be enhanced when innovating in travel market distribution.

Lastly, with the unprecedented increase in food delivery demand due to the new consumption habits of individuals, delivery pricing is an issue to consider keeping consumers happy and continuously demanding this service. Research in economics and in service marketing have described how consumers do recognize the “free” under a product’s price differently. This pricing approach is based upon that widespread notion that providing free goods or services to customers adds value to them and so increases their desire to buy. In the last part of the dissertation, we study the Zero price model on a multicomponent product with Food being the first component (where its price is always positive) and the delivery service as the second (where its price will eventually hit the zero-price tag). Elaborating more on previous studies and filling their gaps, we will be dividing the zero-price model into three scenarios: The true free scenario, the true free scenario with different discounts, and the fake-free scenario as each one is expected to yield different consumer behaviors in the process, but all should act similarly when the price hits the “free” tag.

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GENERAL AUDIENCE ABSTRACT

The hospitality industry is deeply intertwined, as retailers and suppliers rely on one another for success. Retailers depend on suppliers for essential goods and services, while suppliers count on retailers for purchasing and promoting their products. With increasing competition, it is vital for companies to select the right suppliers. Merely focusing on profit maximization is no longer sufficient, as there is growing pressure to adopt socially and environmentally responsible practices. Factors such as environmental, social, political aspects, and customer satisfaction now play a role in supplier selection. Restaurants strive to collaborate with suppliers that meet their criteria, but these suppliers may still encounter issues like food safety, ethical dilemmas, environmental issues, and human rights problems. The question remains whether customers hold restaurants accountable for their suppliers' mistakes. The first part of this dissertation investigates consumer responses to negative supplier news and its impact on their choice of restaurants.

In another aspect, Online Travel Agents (OTAs) significantly influence the travel market. Innovation is a critical factor in achieving success, yet there has been limited research on innovation within the OTA context. The second part of this dissertation seeks to bridge this gap by examining how OTA innovations affect their performance. The study reveals that certain innovations have a more significant impact on OTA performance than others, indicating that enhancing exchange management is essential for innovation within the travel market.

Lastly, the surge in food delivery demand has made delivery pricing a crucial aspect in maintaining customer satisfaction and promoting continued use of the service. Research indicates that consumers perceive "free" items or services distinctively, with "free" offers increasing their inclination to purchase. The last part of this dissertation explores the Zero price model for food delivery, wherein the food is the first component with a positive price, and the delivery service is the second component with a potentially free price. We categorize the zero-price model into three scenarios: true free, true free with different discounts, and fake-free, anticipating that they will result in different consumer behaviors, but all should exhibit similar effects when the price is "free."

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Chapter 1: Introduction

In the realm of the hospitality industry, characterized by fierce competition, the attainment of customer satisfaction is deemed pivotal for the triumph of hotels and restaurants. The supply chain and distribution channels therein occupy a momentous position in guaranteeing the timely delivery of superior quality products and services, thereby engendering contentment among customers, and facilitating their return patronage.

Hotels and restaurants, being critical players in the hospitality sector, engage in partnerships with suppliers to acquire essential commodities such as food and beverages, culinary supplies, and laundry provisions, among other inbound logistics, with the aim of facilitating the prompt delivery of their hospitality services on a daily basis (Song, 2011).

In this case, hotels and restaurants coordinate and collaborate with a wide range of suppliers that have experience in adjacent disciplines in order to achieve operational excellence. The management of inter-organizational interactions between hospitality businesses and their suppliers is therefore essential (Wang, Chen, Lee, and Tsai, 2013).

The significance of inter-organizational relationships for hospitality firms has been highlighted by Theuvsen (2004). According to Schermerhorn's (1975) conceptualization, inter-organizational relationships pertain to the intentional connections formed between otherwise independent organizations, with the aim of collectively attaining individual operational objectives. It has been observed that inter-organizational relationships are characterized by interdependence, trust-based

commitments, and a long-term focus on shared objectives amongst organizational partners (Ring and Van de Ven, 1994). Within this context, a supply chain is a form of cooperation that manages inter-organizational relationships, facilitates operational activities across organizational boundaries, lowers operational costs, and leverages the resources and capabilities of supply chain partners (Zhang, Song, and Huang, 2009).

Within this context, the selection of appropriate suppliers assumes paramount importance for hotels and restaurants to ensure the provision of high-quality, readily available, and punctual products and services, leading to enhanced customer satisfaction (Zhong, Ma, Tu, and Li, 2016). Despite the restaurant industry's efforts to partner with suppliers that align with their needs and standards (Martínez-López and Vargas-Sánchez, 2013), such suppliers may encounter internal challenges and issues that contravene these norms. These issues may include food safety concerns, supplier malpractice, among others, which can potentially have severe implications for the affected restaurants and their reputation. Consequently, the first article in this dissertation focuses on the indirect impact of supplier errors and issues on the market value of restaurants. By studying the impact of these issues, this article aims to provide valuable insights into the importance of effective supplier management in the restaurant industry, and how an issue that is not directly related to the restaurant can still harm its reputation.

Numerous sectors have expressed interest in researching how supplier behavior affects organizations (Ganesan, George, Jap, Palmatier, and Weitz, 2009). But for a number of reasons, it is essential to examine this subject in the context of the restaurant business. Restaurants completely depend on suppliers to supply their principal product, which is food, in contrast to other companies that depend on suppliers for raw materials or components. As a result, any issues that arise with suppliers to the restaurant business may have a greater negative effect on the success of the sector.

In order to spot possible problems and maintain the industry's viability, it is crucial to comprehend the relationship between restaurants and their suppliers. Moreover, customers are not just buying food, they are also seeking an experience. The dining experience can be seen as an extension of the customer's home, where they are looking for a comfortable and enjoyable atmosphere that aligns with their beliefs and safety. Customers want to feel confident in the quality of the food they are eating, and they want to know that it has been sourced and prepared responsibly. A welcoming atmosphere that reflects these values is key to creating a dining experience that customers will want to return to. Moreover, the restaurant industry is subject to greater scrutiny and regulations than many other industries. For example, food safety regulations are stricter, and suppliers must adhere to ethical, social, and environmental standards. This is because food quality and safety are critical to the industry's success and customer satisfaction. Therefore, restaurants must ensure that their suppliers meet these standards, and if they fail to do so, it can harm their brand image.

Following the procurement of supplies and the creation of final products or services, it becomes imperative for hotels and restaurants to ensure the prompt and efficient delivery of these offerings to their end customers. In this regard, distribution channels assume a critical role in facilitating the delivery of products and services to these customers.

In the hotel's case, the emergence of digital intermediaries, such as online travel agencies (OTAs), has had a significant impact on the hotel industry's distribution process. These OTAs have supplemented and, in some cases, displaced traditional channels. Compared to traditional distribution channels, the use of OTAs offers customers numerous benefits. Not only are they financially attractive to consumers, as evidenced by research (Hao, Yu, Law, and Fong, 2015), but they also provide faster transaction times (Agag and El-Masry, 2016) and a more extensive range of products and services (Liu and Zhang, 2014).

Moreover, in this segment of the hotel distribution channel, there is intense competition, prompting OTAs to seek innovative solutions to maintain a competitive edge (Hjalager, 2002), grow (Love, Roper, and Bryson, 2011) and survive (Hjalager, 2002). As a result, the second article of this dissertation aims to investigate the impact of innovation implementation on the market value of key players in the OTA segment of the hotel distribution channel. By examining the correlation between innovation and market value, this study seeks to provide insights into the importance of innovation for OTAs seeking to remain competitive in a dynamic market environment: the hotel distribution channel.

In conclusion, investigating the effects of innovation implementation on the performance of online travel agents (OTAs) is crucial due to its implications for competitiveness, customer expectations, technological advancements, operational efficiency, adaptability, sustainability, and industry evolution. By comprehending the impact of innovations on performance, OTAs can strategically differentiate themselves, cater to tech-savvy customers' demands, prioritize investments in emerging technologies, and streamline operations. Additionally, the study of innovation fosters resilience to external shocks and promotes environmentally conscious practices, further contributing to the broader understanding of the hospitality and tourism industry's dynamics and trends.

Regarding the restaurant industry, food delivery services have become an increasingly vital component, especially in the wake of the COVID-19 pandemic. With many consumers opting to stay home and order food online, delivery has become a crucial part of the restaurant distribution channel. The convenience and ease of ordering food from the comfort of one's own home have driven the popularity of restaurant delivery services. Additionally, delivery services have enabled restaurants to continue operating during times of social distancing and restricted indoor dining,

helping to sustain their businesses (Zhao and Bacao, 2020). As a result, delivery has become an essential aspect of the restaurant distribution channel, and restaurants that do not offer delivery may be missing out on a significant portion of potential customers. Effective pricing of delivery services is a critical factor for restaurants as it can have a significant impact on their profitability and customer behavior. As such, the third article of this dissertation delves into the pricing aspect of these services, with a particular focus on the zero-price model. This article aims to investigate how offering free delivery services can affect consumer behavior and purchasing patterns. By analyzing the impact of free delivery services on customer behavior, this study can shed light on the potential benefits of implementing a zero-price model for delivery services in the restaurant industry.

In summary, analyzing the effects of pricing strategies, such as free delivery, on consumer purchasing behavior in the restaurant industry is essential due to its implications for consumer sensitivity, competitive advantage, food delivery service adoption, profitability, customer loyalty, market adaptability, and informed decision-making. Understanding the impact of various pricing strategies helps restaurants tailor offerings, maximize revenue, differentiate themselves, optimize pricing models, and foster long-term customer relationships. Furthermore, this knowledge enables restaurants to respond to evolving market conditions and contributes to data-driven pricing strategies that align with business objectives and enhance overall performance.

The supply chain for the hospitality industry is examined in this dissertation based on three separate but related topics. These aspects include how supplier mistakes affect the market value of restaurants, how innovations affect the market value of online travel agencies, and how consumers' purchasing habits are affected by free food delivery services. The dissertation seeks to offer a

thorough understanding of the hospitality industry supply chain and the interactions between its many components.

The common thread woven through these three articles is their joint exploration of the ways diverse business practices and strategies affect consumer perceptions, behavior, and company performance in the hospitality and tourism industry. This shared focus underscores the importance of businesses embracing a holistic approach to tackle the myriad challenges and complexities that this dynamic sector presents.

To effectively navigate the ever-evolving landscape of hospitality and tourism, businesses must excel at understanding and adapting to the constantly changing needs and preferences of their customers. This necessitates the integration of various strategies, such as efficient supplier selection, innovation, and pricing, into their daily operations.

In this vein, Article 1 emphasizes the importance of supplier selection, specifically the ethical considerations and business practices of suppliers, in shaping customer perceptions and the image of restaurant brands by looking at the suppliers' issues and their negative effect on restaurant performance. This focus on consumer perceptions sets the stage for Article 2, which investigates the role of innovation in the online travel agent sector, another area where customer perceptions are crucial. As both articles revolve around factors influencing consumer perceptions, they share a common understanding that businesses must prioritize strategies that positively impact consumer perceptions in the competitive hospitality and tourism sector.

The relationship between supplier selection, supplier-related issues in the restaurant sector, and innovation implementation in Online Travel Agents can be examined through the lens of maintaining and enhancing business image and competitiveness within the hospitality and tourism

industry. The process of supplier selection and the consequences of supplier issues, such as food safety concerns, ethical issues, and environmental impacts, are directly tied to the image and customer perceptions and satisfaction of the restaurants collaborating with these suppliers. Likewise, the adoption of innovative strategies and practices in online travel agencies significantly influences their competitive positioning, performance, and customer satisfaction.

The connection between Articles 2 and 3 is established through the exploration of how diverse corporate strategies, such as innovation and pricing, influence customer decisions. Article 3 delves into the realm of food delivery, focusing on the impact of pricing strategies (a unique form of innovation) on consumer behavior. Meanwhile, Article 2 evaluates the effect of innovation on company performance and its subsequent influence on customer preferences in the context of online travel agencies. Collectively, both articles contribute to a deeper understanding of the importance of aligning business strategies with consumer preferences to maintain a competitive edge in the hospitality and tourism sectors.

Innovation plays a vital role in shaping the food delivery landscape, as it directly impacts service efficiency, user experience, and the pricing strategies employed by businesses. Technology improvements like mobile applications, sophisticated algorithms, and data-driven decision-making allow food delivery platforms to shorten their delivery routes, increase order accuracy, and optimize their operations. As a result, these developments may result in cost savings for businesses, enabling them to pass along the savings to customers through more aggressive pricing policies (such as offering free delivery), thus raising customer satisfaction and loyalty.

Additionally, service innovation is instrumental in influencing behavioral intention and improving customer experience (Khan, 2020). The unique characteristics of hospitality service innovations, such as intangibility, heterogeneity, concurrent production and service, and perishability,

differentiate them from other industries (Khan, 2020). Studies indicate that technological progress is propelling transformations in service delivery approaches, highlighting the importance for service providers to embrace and capitalize on these developments to offer effective services (Su, 2011).

Moreover, the integration of sustainability and environmentally conscious practices within the food delivery ecosystem represents another dimension of innovation. By adopting eco-friendly packaging materials, electric delivery vehicles, and minimizing food waste, companies can incorporate sustainable practices into their operations. This alignment with the growing consumer demand for environmentally responsible businesses can translate into increased customer loyalty and a higher likelihood of repeat business.

In conclusion, innovation plays a critical role in shaping the food delivery landscape and its pricing strategies. By harnessing technology, adopting innovative business models, and integrating sustainable practices, businesses can enhance their operations, cater to evolving consumer preferences, and maintain a competitive edge in an increasingly dynamic industry.

The central theme uniting these three articles emphasizes the need for businesses in the hospitality and tourism industry to adopt a comprehensive approach when managing their operations. This involves considering various aspects of supplier selection, innovation, and pricing strategies that directly influence consumer perceptions and behavior. By providing valuable insights and guidance through the examination of these interconnected factors, the research aims to equip businesses with the knowledge needed to make informed decisions that promote success, uphold high ethical standards, and ultimately boost customer satisfaction in an increasingly competitive market.

Chapter 2: Supplier Slip-Ups: How Mistakes can Bite into Restaurant Market Value

Abstract

The hospitality industry is characterized by a close interdependence between retailers and suppliers. Retailers depend on suppliers to provide the necessary goods and services to operate effectively, while suppliers rely on retailers to buy and market their products. With intense competition in the industry, effective supplier selection has become a critical asset for companies. Traditional supply chain management approaches that focus solely on increasing economic value are insufficient in the face of growing pressure for socially and environmentally responsible business practices. As a result, new criteria, including environmental, social, political, and customer satisfaction considerations, have been added to the pre-existing factors in supplier selection. While restaurants strive to select suppliers who meet their quality, social, and environmental standards, these suppliers may still face internal issues such as food safety, ethical malpractice, environmental concerns, and human rights issues. When such issues arise, it is unclear whether customers hold restaurants accountable for the mistakes of their suppliers, even when the restaurant has not been directly involved in these issues. This paper aims to explore how consumers associate negative news about supplier food quality and practices with the restaurants they patronize. By doing so, this paper contributes to a better understanding of the indirect link between supplier issues and restaurant market value.

Introduction

The hospitality industry is undergoing significant changes in supply chain management due to intensifying competition and mounting pressure for socially and environmentally responsible practices. Merely prioritizing economic value is no longer sufficient (Hassini, Surti, and Searcy, 2012). To adapt to this, restaurants are now incorporating new criteria, such as environmental sustainability, social responsibility, and customer satisfaction into their supplier selection process (Taherdoost and Bard, 2019). This enables them to maintain high-quality standards while also meeting customer expectations and aligning with evolving social standards.

In the food service industry, the principle of "buying right to sell right" has always been fundamental (Reynolds, 1966). When purchasing products, it is crucial for restaurants to not only consider the quality of the raw products but also the standards and practices of the suppliers they source from. Therefore, responsible purchasing involves ensuring and continuously monitoring that suppliers follow ethical, sustainable, and environmentally friendly practices that align with the restaurant's values.

Extensive literature has examined the positive effects of implementing social and food safety practices on the individual performances of hospitality companies or suppliers (Shin, Sharma, Nicolau, and Kang, 2021; Nicolau, 2008; Mathe, 2012; Pullman, Maloni, and Carter, 2009). Conversely, studies have also explored the negative impact on performance when these practices are not followed (Kang, Lee, and Huh, 2010; Seo, Jang, Miao, Almanza, and Behnke, 2013; Kabir, Watson, and Somaratna, 2018). However, the literature has yet to explore how such issues on one side can affect the reputation and performance of the other side.

This is a significant issue since restaurants pledge to their patrons that they would uphold strict standards for social and food safety measures both within the restaurant and with their suppliers. The establishment of a trustworthy connection between the restaurant and its patrons depends on this guarantee. While the restaurant has direct control over its own internal procedures, it has no direct influence over the behavior of its suppliers. Although the majority of the restaurant's suppliers adhere to its requirements, occasionally a supplier may run into internal issues that go against those standards, endangering the restaurant's good reputation. Examples of these challenges include food safety, ethical and malpractice issues, environmental issues, and human rights concerns.

To address this gap in the literature, this article aims to investigate the indirect effects of suppliers' issues on the market values of the restaurants that choose to work with them. More specifically, the question at hand is whether customers place responsibility on restaurants for the errors made by their suppliers, even if the restaurant is not directly involved in the problems. Moreover, this article also aims to explore whether the various supplier issues mentioned earlier would produce different impacts on these restaurants.

On a different note, supplier issues are also categorized into two types based on how restaurant patrons become aware of them through news, as each should have a different impact on the restaurant: direct links and indirect links. In the case of direct links, news articles often mention the names of the restaurants that deal with the supplier facing issues, in order to attract more readers. This makes it easy for restaurant patrons to directly associate the supplier's issue with the restaurant. In contrast, indirect links occur when news articles do not mention the names of the restaurants that work with the supplier facing issues. This can make it more challenging for restaurant patrons to link the supplier's issues to the restaurant. To explain this indirect link, we

refer to Collins and Loftus's (1975) associative network memory paradigm and the halo effect (Kalaighnam, Kushwaha, and Eilert, 2013).

Literature review

In the hospitality industry, retailers and suppliers have an interdependent relationship, where both entities rely on one another to attain their objectives. Retailers depend on suppliers to supply the necessary goods and services to conduct their operations, and suppliers depend on retailers to buy and market their products (Murphy and Smith, 2009). Therefore, for a restaurant to achieve success and be effective, it must have the ability to collaborate efficiently with these external organizations (Aigbedo, 2021)

Additionally, the hospitality industry's intense competition has led companies to rely heavily on their key suppliers, making effective supplier selection a valuable asset. The suppliers' proficiency in critical areas such as product and service quality, cost, and delivery significantly impacts the purchasing companies' ability to provide their clients with defect-free products (Kim, 2006). Nevertheless, the conventional supply chain management approach, which solely focuses on increasing economic value, is insufficient. This is due to the mounting influence from consumers, grassroots organizations, community groups, government bodies, shareholders, and competitors, all of whom are pushing for socially and environmentally responsible business practices (Hassini, Surti, and Searcy, 2012). As a result, new criteria, including environmental, social, political, and customer satisfaction considerations, have recently been added to the pre-existing factors in supplier selection (Taherdoost and Bard, 2019). Furthermore, publicly traded restaurants clearly demonstrate their commitment to these criteria by including them in their annual reports filed with

the Securities and Exchange Commission (SEC). For instance, Chipotle Mexican Grill stated plainly in their 2023 SEC annual report that “ we strive to serve only meats that are raised in accordance with criteria we have established in an effort to improve sustainability and promote animal welfare ... by which we mean produce grown by suppliers whose practices conform to our Food With Integrity standards and our priorities with respect to environmental considerations and employee welfare ... suppliers we carefully select based on quality, price, availability, and the suppliers’ understanding of and adherence to our mission and Food With Integrity standards”.

Therefore, it is widely acknowledged that selecting capable suppliers who meet most, if not all, of these criteria is an essential part of ensuring the quality, safety, and value of products and services for restaurants and their customers (Walters, 2018). This can increase customer satisfaction, reduce operational costs, improve the restaurant's financial position, and boost the restaurant's reputation (Zhong, Ma, Tu, and Li, 2016).

However, while restaurants typically strive to choose the best suppliers to meet their needs and their social, environmental, and quality standards (Martínez-López and Vargas-Sánchez, 2013), and proudly and publicly disclose the review methods they use to ensure that these standards are consistently upheld by these suppliers, it is not uncommon for these suppliers to experience various challenges and issues internally that contradicts these standards. Some of these important examples include food safety issues; ethical/malpractice issues such as corruption, bribery, food fraud, discrimination, and animal welfare; environmental issues; and human rights issues.

Several major food and drinks suppliers have faced controversies related to the issues aforementioned. In 2011, Tyson Foods, a supplier of McDonalds, settled a bribery case with the SEC over allegations that its Mexican subsidiary had made improper payments to government veterinarians to expedite the approval of its products (U.S. Securities and Exchange Commission

(SEC.gov), 2011). Additionally, in 2000, Snoopy, Winnie the Pooh and Hello Kitty toys sold with McDonald's meals in Hong Kong were made at a mainland Chinese sweatshop that illegally employs child laborers to package the toys. Lastly, in 2014, a Chinese meat supplier that supplies Starbucks was selling expired meat.

Therefore, the question being raised is whether consumers hold restaurants accountable for the mistakes of their suppliers, even if the restaurant itself has not been involved in the issues.

To answer that question, it is important to understand how restaurant patrons could associate negative news about a supplier food quality and practices with the establishment they patronize.

The indirect link

Business transparency cues, such as information transparency and exposure, can significantly shape customers' perceptions and decision-making processes (Springer and Whittaker, 2018), and enforce the association between parties in the supply chain. In the hospitality industry, transparency is particularly important for building brand loyalty and trust among external stakeholders who may lack access to detailed background information (Busser and Shulga, 2019; Tapscott and Ticoll, 2003). According to Martinez and Crowther (2008), transparency is a means of transferring power from the firm to its stakeholders, reducing information asymmetry and allowing informed evaluations of the firms' products. Companies have traditionally guarded supply chain information to protect their competitive advantage but may benefit from voluntary disclosure to increase sales, build public trust, and generate word-of-mouth marketing (Pettey, 2018). However, the demand for transparency in food production, ingredients, and supply chains has been on the rise among consumers (Duffy, Fearn, and Healing, 2005). In response, supply chain transparency has become a vital aspect of contemporary food supply chains, enabling stakeholders

to access accurate, pertinent, and timely information about supply chain products (Wognum, Bremmers, Trienekens, Van Der Vorst, and Bloemhof, 2011). Moreover, Access to information in transparent supply chains is simple, fast, and comprehensible (Trienekens, Wognum, Beulens, and Van Der Vorst, 2012), making the association between a restaurant and the supplier strong.

Collins and Loftus' (1975) associative network memory paradigm provides a theoretical framework to understand how restaurant patrons may link suppliers' problems to the restaurant image. According to this paradigm, memory is not a unitary structure, but rather a network of interconnected concepts that are linked through associations. When a patron is exposed to information about a supplier's problem, this information activates related concepts in the network, such as the restaurant's name. The activation of these concepts can lead to the creation of new associations between the supplier's problem and the restaurant image. For example, if a patron learns that a supplier used unethical practices, they may associate this information with the restaurant's name and develop a negative perception of the restaurant's ethics. Overall, Collins and Loftus' paradigm suggests that restaurant patrons may indirectly link suppliers' mistakes to the restaurant image through the activation and creation of associations in their memory network.

On another note, the halo effect, a psychological phenomenon in which an impression formed in one area can impact opinions in another area, is a widely recognized concept (Kalaignanam, Kushwaha, and Eilert, 2013). Similarly, Leuthesser, Kohli, and Harich (1995) describe the halo effect as the tendency of individuals to struggle with distinguishing between attributes that are conceptually unique and potentially autonomous. In other words, it refers to the phenomenon where observing a part can lead to inferences about the whole. When a supplier makes a mistake that impacts the quality of the restaurant's food or social and environmental standards, such as delivering spoiled ingredients or causing deforestations, the halo effect can cause customers to link

that issue back to the restaurant itself, and can create a negative impression of the restaurant, even if the restaurant is not directly at fault. This negative impression can be linked back to the restaurant and its image because patrons may assume that the restaurant is responsible for ensuring the quality, safety, and the environmental and social traces of the food they serve, especially when these restaurants are publicly disclosing the review methods they use to ensure that these standards are consistently upheld by these suppliers (Luo and Bhattacharya, 2009).

The direct dink: the role of news reports

In recent years, news outlets have increasingly reported on incidents where suppliers have made mistakes that have affected the restaurants they supply. These mistakes can range from food safety issues to supply malpractice, and they can have serious consequences for the affected restaurants. Even if the restaurant was not directly to blame for the error, news media frequently utilize the name of the restaurant in the report's title. One may argue that the practice of including the restaurant's name in the report's title is sensationalism. By highlighting the restaurant's name in the title of the report, news outlets are more likely to attract clicks and views, which can lead to higher advertising revenue.

For instance, two news articles illustrate the practice of including restaurant names in reports about supplier mistakes. Eurofood's article was titled "McDonald's supplier admits to malpractice", while Postmedia Breaking News titled their piece "KFC takes a hit in China after report said suppliers giving chickens unapproved levels of antibiotics."

This practice can have serious consequences for the affected restaurants. By including the restaurant name in the title of the report, news outlets are associating the supplier mistake directly with the restaurant's name. This can create the impression that the restaurant is somehow

responsible for the mistake, or that the restaurant is somehow complicit in the supplier's error. This association can damage the restaurant's image and lead to a loss of trust among its customers, ultimately reflecting poorly on corporate management (Piotr and Dawid, 2017), market share and brand equity (Moratis, 2016). Moreover, studies have shown that negative information captures consumer attention more powerfully than positive information (Ahluwalia, 2000), exponentially tarnishing the reputation of the restaurant (Fombrun and Shanley, 1990).

Supplier issues as bad signals for restaurants

Signaling theory serves as a robust conceptual framework that has gained traction in management research (Bergh, Connelly, Ketchen, and Shannon, 2014) and investment decision-making explanations (Alsos and Ljunggren, 2017). The theory primarily concentrates on the management's objective to disseminate information and obtain cues from the market, stakeholders, and the broader community. Information asymmetry can lead to potential disputes between management and agents within an organizational setting, but signaling helps to mitigate this discrepancy by transmitting pertinent and high-quality information to various parties (Taj, 2016; Connelly, 2011).

Signaling theory consists of four components: the signaler, signals, receiver, and feedback, which align with the fundamental communication channel (Taj, 2016; Connelly, 2011). In a business context, management insiders act as signalers, while the flow of information serves as the signals. Conversely, receivers are outsiders who lack access to insider information. Feedback represents the interplay between signalers and receivers (Taj, 2016; Connelly, 2011; Mavlanova, Benbunan-Fich, and Koufaris, 2012; Morris, 1987). Within the signaling process, the signaler and receiver are the principal actors, and the signals convey either positive or negative information to address

information asymmetry. Positive signals enhance company value and performance, while negative signals decrease stock prices and product demand (Morris, 1987; Dionne and Ouederni, 2011).

Moreover, consumers tend to assign varying levels of importance to positive and negative information when evaluating them, as noted by Lucking-Reiley, Bryan, Prasad, and Reeves (2007). This phenomenon is referred to as negativity bias, wherein negative information is given more significance than positive information, as described by Klein (1996) and Skowronski and Carlston (1989). Scholars have asserted that negative information's attitudinal impact is generally more significant than positive information's impact (Richey, Koenigs, Richey, and Fortin, 1975).

Maheswaran and Meyers-Levy (1990) and Skowronski and Carlston (1989) have found that negative information is more informative and diagnostic than positive information in the consumer decision-making process. Ba and Pavlou (2002) and Chevalier and Mayzlin (2006) have demonstrated that negative information has a more significant impact on a company's financial situation and price premiums than positive information. Consumer decision-making involves perceived risk between alternatives, according to the prospect theory developed by Kahneman and Tversky (1979), and people tend to base their decisions on potential losses rather than future gains. This phenomenon leads to negative information having more weight in the decision-making process.

Within our context, the majority of news originates from the media rather than the companies themselves. In such a situation, the media can play a crucial role in disseminating information and assisting external investors in making decisions, as indicated by Lee and Wang (2017). Guldiken, Tupper, Nair, and Yu (2017) observed that numerous studies employing signaling theory demonstrate that signals do not always need to come directly from the signaler. For instance,

existing literature reveals that the media frequently offer signals about companies (e.g., Daniel and Titman, 2006; Deephouse, 2000).

In this case, media coverage on supplier issues can make these supplier issues become signals: when a restaurant's suppliers face negative issues related to food quality, ethical practices, environmental concerns, or human rights violations, these issues act as signals to the restaurant's stakeholders. Stakeholders may interpret the negative supplier signals as an indication of the restaurant's lack of commitment to quality, ethical standards, environmental responsibility, or human rights. This perception can affect their trust in the company and their willingness to engage with it. Moreover, Customers may choose to purchase products or services from competitors who have better supplier practices, leading to decreased sales and potential damage to the company's brand image. Furthermore, Investors may perceive the company as a riskier investment due to potential future scandals or regulatory penalties, leading to reduced investment and potentially negatively impacting the company's stock price.

Therefore, according to the signaling theory, and the negative effect of bad signals on the performance of a company, we propose the following hypothesis:

H1: *Bad news regarding a supplier will negatively impact restaurants' market value.*

Furthermore, a restaurant's market value can be significantly impacted when its name is directly linked to a supplier that has received negative media coverage. This is because consumers may associate the unfavorable news directly with the restaurant, which could result in a decrease in demand for its products and services due to reduced consumer trust. Conversely, if the media coverage only targets the supplier without mentioning the restaurant's name, the impact on the

restaurant's market value may be less significant as consumers may not immediately make a connection between the negative news and the restaurant.

H2: *Directly linking a restaurant to a supplier receiving bad news in the media will have a greater impact on the restaurant's market value than if the restaurant is not mentioned in the news article.*

The effects of supplier issues on a restaurant's market value can be variable, contingent on the type of issue at hand. For instance, concerns pertaining to food safety and ethical/malpractice issues like corruption, bribery, food fraud, discrimination, and animal welfare may have a more pronounced impact on how consumers perceive and trust a restaurant's offerings. This can lead to a decrease in demand and a consequent decline in market value. Similarly, environmental and human rights concerns can also affect how consumers perceive a restaurant's values and cause a drop in demand for their products or services. Hence, it is critical to understand the specific impact of each type of issue on a restaurant's market value.

H3: *Different types of suppliers' issues will lead to different effects on the restaurants' market value.*

Data collection and analysis

To evaluate the effect of supplier issues on the performance of the restaurant firm and examine hypothesis 1, we utilize an event study methodology in accordance with McWilliams and Siegel's (1997) guidelines. To test hypothesis 2 and 3, we will conduct two distinct regression analyses.

The event study methodology is derived from a key proposition of neoclassical economics, known as the efficient market hypothesis. This hypothesis asserts that the price of an asset at any point in

time reflects its value, considering all available information (Fama, Fisher, Jensen, and Roll, 1969). Consequently, any alteration in the price of an asset, such as a firm's stock returns, that arises after an event is deemed to measure the event's effect. The approach revolves around isolating the "abnormal" returns that are attributable to an event and have an impact on the firm's performance, from the "normal returns" that stem from regular business operations. This method comprises a series of steps that adhere to the guidelines put forth by McWilliams and Siegel (1997). These guidelines propose a procedural framework that commences with identifying the event dates, ascertaining the duration of the event window, identifying any possible extraneous factors, estimating the market model, and ultimately evaluating abnormal returns.

1. To begin with, it is crucial to establish the precise date on which the new and unforeseen information was disseminated to the market. Any ambiguity regarding the event date would complicate the process of determining the time frame within which to assess the event's impact. In our scenario, we have defined the event date as the day when the supplier issue information was initially made public. Therefore, we will execute a keyword search in the Factiva database spanning from 2000 to 2022, including major publicly traded restaurants in the US stock market such as Restaurant Brands Intl Inc, Chipotle Mexican Grill Inc, Domino's Pizza Inc, McDonald's Corp, Starbucks Corp, and Yum Brands Inc, and their main suppliers such as Tyson Foods, Lopez Foods, Keystone Foods, McCain Foods, Cargill, Dairy Farmers of America, JBS USA, General Mills and many more, followed by keywords related to suppliers issues, such as "Food safety", "Food hygiene", "Food sanitation", "Food security", "Foodborne illness", "Bribery", "unethical", "immoral", "dishonest", "Wrong", "Improper", "Fraudulent", "food fraud", "discrimination", "Racism", "Bias", "Sexism", "unfairness",

“animal welfare”, “animal rights”, “animal protection”, “inhumane”, “environmental issues”, “Environmental problems“, “Environmental challenges“, “Ecological issues“, “Green issues“, “Habitat destruction issues“, “Deforestation issues“, “human rights issues”, “social justice issues”, “equality issues”, and “corruption”.

At first, a total of 77 announcements were identified, but upon filtering out those that were in close proximity to each other, the final sample size is reduced to 51 announcements.

Next, the gathered data points will be categorized into distinct groups. These categories will include Direct Link, in which the restaurant's name is explicitly connected to the supplier's issues in news articles, and Indirect Link, in which the restaurant's name is not explicitly connected to the supplier's issues in news articles. It is important to note that in the indirect link section of our study, we opted to establish Tyson Foods as the supplier for Yum Brands Inc, Restaurant Brands Intl Inc, and McDonald’s Corp. This was done to maintain a strong association between the restaurants and their respective supplier, as the relationship between Tyson Foods and these restaurants was publicly known and information about any issues related to Tyson Foods was widely available. Additionally, the collected data points are subdivided into various issue types to investigate the diverse impacts of different types of issues, such as Food Safety Issues, Environmental Issues, and Human Rights Issues.

2. Secondly, it is imperative to establish the duration of the event window. To account for possible information leaks or delays in investors' responses (in some cases, shareholders may take longer than expected to reassess the given information), we employ a (-3,+3) event window to examine the potential presence of excess returns before and after the announcement. While

longer event windows increase the likelihood of discovering a greater number of excess returns, they also carry a significant drawback: these extended windows are more prone to being influenced by other events unrelated to the announcements analyzed in this study. Consequently, we cannot guarantee that any potential excess returns discovered far from the event day are genuinely derived from the given announcement or some other external news (McWilliams and Siegel, 1997).

3. Thirdly, it is crucial to identify any potential confounding effects. To prevent spurious abnormal returns, it is essential to detect and remove any events unrelated to the supplier's issue announcements that may occur during the event window. To accomplish this, we employ the Factiva database to search for news items that are not connected to the supplier's issues but may emerge in the (+3,-3) window.
4. Fourthly, the market model is estimated. To compute normal returns, we extracted stock market data from the WRDS database and estimated the market model suggested by Sharpe (1963) for a 150-day period prior to the event. This model is defined as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

The market model estimation involves calculating the normal returns for the firms in question. This is done by using the firm's daily return R_{it} on a given day t and comparing it to the market index return R_{mt} on the same day. The market model also takes into account the constant reflecting market-independent returns of the firm α_i and the effect of market returns on the firm β_i .

Additionally, the model includes an error term ε_{it} , which follows an autoregressive conditional heteroskedasticity model GARCH (1,1).

The generalized autoregressive conditional heteroskedasticity model (GARCH) proposed by Bollerslev (1986) captures the dynamics of conditional variance, denoted as h_{it} , which can change over time. This model is an extension of the ARCH model, and it takes into account the persistence of shocks to the variance, known as volatility clustering, by estimating the present variance based on past squared observations and historical variance. The GARCH model is defined as:

$$h_{it} = c_i + \lambda_i \varepsilon_{it-1}^2 + \gamma_i h_{it-1}$$

where $\varepsilon_{it} = h_{it}^{1/2} \eta_{it}$, where $\varepsilon_{it} / \varepsilon_{it-1}, \varepsilon_{it-2}, \dots \sim N(0, h_{it})$, and η_{it} is independently and identically distribute with $E(\eta_{it}) = 0$ and $E(\eta_{it}^2) = 1$. Finally, c_i , λ_i , and γ_i are parameters to be estimated.

Next, Abnormal returns are calculated using the following formula:

$$AR_{it} = R_{it} - (a_i + b_i R_{mt})$$

where a_i and b_i are the estimated parameters from the market model for a period of t days before the event.

The statistical significance of the abnormal returns is evaluated using Pilotte's (1992) cross-sectional test, which is expressed as:

$$t = \frac{\frac{1}{N} \sum_{i=1}^N AR_i}{\sqrt{\frac{1}{N(N-1)} \sum_{i=1}^N \left(AR_i - \sum_{i=1}^N \frac{AR_i}{N} \right)^2}}$$

Let N denote the number of announcements and let AR_i represent the abnormal return for each day during the event window.

Then, to investigate Hypotheses 2 and 3, we conduct regression analyses. In the first analysis, the abnormal returns of each announcement will be the dependent variable, while the Direct link and indirect link will be the independent variables. The Direct link will serve as the baseline reference to estimate the model. In the second analysis, the independent variables will be different issue types, namely Food Safety issues, Environmental Issues, and Human rights issues. The Food Safety issues will be used as the baseline reference to estimate the model.

Results

Table 1 displays the impact of supplier issues announcements on the performance of restaurants. The findings suggest a significant negative reaction on the same day and the following day after the announcement of supplier issues. Specifically, abnormal returns of negative 0.34% and negative 0.31% were identified on the same day and the day after, respectively. Additionally, we observe significant negative effects of 0.42% on day -1, which may be attributable to the possibility of information leakage reaching investors ahead of the official news release. These results provide support for Hypothesis one, which states that supplier issues have an adverse effect on the market

value of restaurants. The announcement of supplier issues indicates to the market that the restaurant's commitment to responsible purchasing practices may not be as strong as advertised, resulting in customer dissatisfaction, loss of retention, and a decrease in restaurant performance.

Date	Abnormal returns	Pilotte's test (p-values)
-2	0.18	0.2187
-1	-0.42%	0.0397
0	-0.34%	0.0764
1	-0.31%	0.0959
2	0.3%	0.1007

Table 1: Effect of supplier issues on Restaurant Market Value.

We then conducted a regression analysis to examine the impact of two types of supplier issue linkages (direct and indirect) and four types of supplier issues (food safety, ethical, environmental, and human rights) on abnormal returns following announcements. The dependent variable was abnormal returns, and the independent variables were the type of linkage and supplier issue. Ethical issues and indirect linkages were used as reference categories for the analysis. Moreover, we included firm size (the coefficient for firm size in our regression model was not statistically significant ($P > 0.1$)) and firm fixed effects as additional variables in our model to control for the potential influence of firm-specific characteristics on the relationship between the main variables and the outcome of interest. The result of the parameter estimates, including p-values (in parentheses) are presented below:

$$\begin{aligned}
 \text{AR}_i = & -0.01686 + 0.01039\text{Direct} + 0.006947\text{FoodSafety} + 0.01523\text{Environmental} + \\
 & 0.01086\text{HumanRights} \\
 & (0.000715) \quad (0.024057) \quad (0.145654) \quad (0.006051) \\
 & (0.044056)
 \end{aligned}$$

The findings indicate that the parameter corresponding to the direct linkage is both statistically significant and positive, suggesting that it is greater than the parameter linked to the indirect linkage reference. These results lend support to Hypothesis 2, which states that linking a restaurant directly to a supplier receiving negative media coverage will have a more substantial effect on the restaurant's market value than if the restaurant is not mentioned in the news article. This effect is unsurprising as a direct linkage between a restaurant and a supplier's issue will likely make it easier for consumers to associate the restaurant with the issue of the supplier.

The results also show that the parameter associated with Food safety, Environmental issues, and Human right issues are all different, hence different than the parameter associated with the base reference ethical issues. This result supports Hypothesis 3 that Different types of suppliers' issues will lead to different effects on the restaurant's market value. This outcome is not surprising as various types of issues hold varying levels of significance for consumers. For instance, food safety concerns may have a more substantial impact on consumers' perception of a restaurant's reputation and quality, while ethical issues may be more crucial for consumers who prioritize social responsibility and ethical standards. Similarly, environmental issues and human rights issues may resonate differently with different consumer groups based on their values and beliefs.

Concluding discussion

This study aimed to investigate the impact of supplier issues on the market value of restaurant firms and assess the significance of different types of supplier issues and their linkages to the restaurants. Employing an event study methodology, the study examined publicly traded restaurant

firms in the United States, focusing on announcements related to supplier issues from 2000 to 2022. The results provided support for all three hypotheses: supplier issues negatively affect the market value of restaurants, direct linkage to a supplier issue has a more substantial impact than an indirect linkage, and different types of supplier issues lead to varying effects on a restaurant's market value.

Theoretically, our findings contribute to the understanding of the relationship between supplier issues and the performance of restaurants, extending the literature on the impact of external factors on firms' market value. Another critical theoretical implication of our findings is the need for a more nuanced approach to studying the impact of supply chain issues on firm performance. By differentiating between various supplier issue types (food safety, environmental, human rights, and ethical issues) and the directness of the link between the restaurant and the supplier's issues, our study highlights the complex interplay of factors that can influence a restaurant's market value. Moreover, this study contributes to the literature on the efficient market hypothesis and event study methodology. Our findings demonstrate that the market reacts to the announcement of supplier issues, providing empirical evidence for the validity of efficient market hypothesis in the context of restaurant industry supply chain events. Additionally, our study highlights the importance of understanding the role of intermediaries, such as the media, in shaping the signaling process. By examining how the direct and indirect linkages between restaurants and suppliers in news articles influence the market's reaction to supplier issue announcements, we contribute to the growing body of literature that examines the role of third parties in the transmission and interpretation of signals. From a managerial standpoint, our results emphasize the importance of maintaining strong relationships with responsible and reliable suppliers and the need for continuous monitoring and evaluation of suppliers' performance. The results emphasize the importance of due diligence and

supplier selection in managing supply chain risks. Managers should carefully assess potential suppliers, considering not only their ability to deliver products and services but also their commitment to ethical, environmental, and human rights standards. By selecting suppliers that align with the restaurant's values, managers can reduce the likelihood of encountering supplier issues that could adversely impact their firms' performance. Moreover, the study highlights the need for robust supplier monitoring and auditing practices. Managers should establish clear procedures and protocols to ensure that suppliers are consistently meeting the restaurant's standards in terms of food safety, environmental impact, and ethical behavior. Regular audits and inspections can help identify potential issues early on, allowing managers to address them proactively before they escalate and lead to negative market reactions. Lastly, managers should consider the diverse preferences and values of their customers when making decisions related to supplier management. The study's findings demonstrate that different types of supplier issues (food safety, environmental, human rights, and ethical issues) have varying effects on restaurant market value, suggesting that managers should prioritize those issues that are most relevant and important to their target audience.

While this study provides valuable insights into the effects of supplier issues on restaurant firms' market value, it is important to acknowledge several limitations that may influence the interpretation of the findings and their generalizability. First, the study's focus on publicly traded restaurants may limit the applicability of the findings to smaller or privately held restaurants. Moreover, in the indirect link part of that study, we only utilized one supplier. Second, the study relies on event study methodology to assess the impact of supplier issues on restaurant firms' market value which focuses on short-term market reactions and may not fully capture the longer-term implications of supplier issues on restaurant performance. Third, the categorization of

supplier issues into distinct groups such as food safety, environmental, and human rights issues, as well as the distinction between direct and indirect linkages, may not fully capture the complexity and nuances of these issues and their interrelationships. For instance, some issues may span multiple categories, making it difficult to disentangle their separate effects on restaurant market value. Additionally, the study's classification of direct and indirect linkages is based on whether the restaurant's name is explicitly mentioned in news articles, which may not always reflect the strength or salience of the connection between the restaurant and the supplier issue in the eyes of stakeholders. Fourth, the study does not account for the potential impact of restaurants' crisis management and communication strategies in mitigating the negative consequences of supplier issues. Different firms may have varying levels of expertise and resources in managing crises, which could influence the magnitude of the impact of supplier issues on their market value.

This study offers a valuable starting point for understanding the impact of supplier issues on restaurant firms' market value. However, there are several avenues for future research that could expand upon and enrich the findings of this study:

1. Investigate different restaurant types: This study focuses on publicly traded restaurants. Future research could examine the effects of supplier issues on privately held restaurants and those operating in different industry segments, such as fast casual or fine dining.
2. Future research could explore the role of various moderating factors, such as restaurant size, market position, brand reputation, or the extent of media coverage, in shaping the impact of supplier issues on restaurant market value. This could help identify the conditions under which supplier issues are more or less damaging to restaurant performance.

3. Assess the role of crisis management and communication strategies: Future research could investigate the effectiveness of different crisis management and communication strategies in reducing the adverse effects of supplier issues on restaurant market value and reputation.
4. Explore the long-term implications of supplier issues: Future research could examine the longer-term implications of supplier issues on restaurant performance, customer satisfaction, and brand reputation, as well as the potential for recovery and reputation repair.
5. Investigate the impact of supplier issues on other stakeholders: While this study examines the effects of supplier issues on restaurant market value, future research could explore the impact of these issues on other stakeholders, such as employees, franchisees, suppliers, and local communities. This could provide a more comprehensive understanding of the broader implications of supplier issues for the restaurant industry.

By addressing these future research directions, scholars can continue to advance the understanding of the complex relationship between supplier issues and restaurant market value, as well as the factors that influence this relationship, ultimately contributing to a more comprehensive and nuanced understanding of the challenges and opportunities facing the restaurant industry.

Chapter 3: Performance effects of innovation in two-sided markets: The paradigmatic case of OTAs

Abstract

Online Travel Agents (OTAs) play an important intermediary role in the two-sided travel distribution market. A critical factor that enhances a firm's competitive advantage is innovation. Yet, the analysis of innovation in the OTA context is scarce. The main objective of this article is to fill this gap and examine the effect of OTA innovations on firm performance. We analyze the effect of two-sided market specific innovations (same-side and cross-side) on performance and contribute to the literature by expanding the theoretical understanding of innovations. We find that producer-to-consumer innovations have a greater effect on OTA performance than producer-to-producer and consumer-to-consumer innovations. A fundamental managerial implication is that exchange management is an area to be enhanced when innovating in travel market distribution.

Introduction

Long before the advent of the internet, the tourism industry had established itself as a pioneer in harnessing advances in computer technology, with companies like American Airlines incorporating Global Distribution Systems (GDS) as far back as the early 1960s (Ozturk and Medeiros, 2022). Technological revolutions have brought about revolutions in tourism (Law, Buhalis, and Cobanoglu, 2014), and it was not surprising, therefore, that the arrival of the internet precipitated significant changes across the industry (Quaglione, Crociata, Agovino, and Iaia, 2020), including adjustments to how tourism products were distributed. Digital intermediaries like online travel agencies (OTAs) emerged, for instance, as significant players in the distribution process (García and Ruiz, 2022a), supplementing and sometimes even displacing traditional channels. OTAs originated in the United States with Expedia.com in 1995 (Leung, Au, Liu, and Law, 2018), and quickly became a viable outlet for producers in the travel industry, such as hotels, airlines and car rental companies, to sell their products to prospective travelers. The specific distributional platforms under which OTAs operate would be seen in the Economics literature as an application of the theory of two-sided markets (Rochet and Tirole, 2003), wherein exchange networks of producers and consumers have been further developed through the internet. The examination of the OTA market under the two-sided network lens is helpful in understanding the relationship between OTAs and the aforementioned producers in the travel industry. More importantly – at least from the perspective of this study – the two-sided lens provides an analytical framework conducive to measuring the impact of OTA innovations, which is the central goal of this research. In fact, while OTAs and intermediaries represent the other side of the coin, the innovations they go through are different from hotels or airlines, and these differences become even more striking when the two-sided market model is included in the argument. Precisely, this

point motivates this research so that we can distinguish the results from previous studies focused on innovation made by producers such as hotels (e.g. Nicolau and Santa Maria, 2013) or airlines (e.g. Nicolau and Santa Maria, 2012). Although making choices on OTAs is not always an easy task—in fact, customers tend to resort to heuristics to make their decisions (Tanford, Choi, and Joe, 2019)—the use of OTAs provides customers with a host of benefits in comparison with traditional distribution channels. Not only are OTAs attractive to consumers from a financial standpoint (see Hao, Yu, Law, and Fong, 2015), but in comparison with traditional distribution channels, they provide users with an increased speed in transactions (Agag and El-Masry, 2016; Buhalis and Law, 2008) and offer a broader variety of products and services (Liu and Zhang, 2014). These factors have contributed to the popularity of these portals, and resulted in an environment where producers in the travel industry routinely collaborate with OTAs to sell their products. Collaboration between OTAs and producers also occurs along other dimensions. The rise of business models based on peer-to-peer trading (Dolnicar, 2020), Airbnb and the sharing economy has disrupted the consumption ecosystem of travel and tourism (Buhalis, Andreu, and Gnoth, 2020), forcing both hotels and OTAs to adapt to the threat posed by the alternative platform. There is a certain level of substitution between hotels and Airbnb (La, Xu, Hu, and Xiao, 2021), and to the extent that hotels are negatively impacted, so too are distribution channels on which they sell, including OTAs. In this regard, OTAs and hotels might certainly consider cooperation as the more viable strategy. Despite the cooperation along these and other dimensions, travel firms listing on OTAs pay a substantial percentage in commission to OTAs. Selling through OTA also means producers have less control over pricing (Egger and Buhalis, 2011; Hayes and Miller, 2011). For these reasons, many travel firms list on OTAs only when necessary, and prefer instead to use direct channels as much as possible. These issues result in a highly complex marketplace in which OTAs

operate. Elements of both competition and cooperation occur, in fact, other several applications of two-sided markets too. For instance, a computer manufacturer like IBM might sell products on a platform like Amazon, but at other times prefer to sell directly through its website. In such markets, innovation plays a critical role (Bilotkach and Rupp, 2014; Muzellec, Ronteau, and Lambkin, 2015) in attaining platform success. Innovation strategies help OTAs increase their competitive advantage (Hjalager, 2002), grow (Love, Roper, and Bryson, 2011) and survive (Hjalager, 2002). However, even though innovation is frequently highlighted in the literature to be a prime enhancer of firms' performance (Salem, 2014), the tourism and hospitality scholarship has not paid much attention to intermediary specific innovation and the resulting impact on performance. When innovation and firm performance have been examined in this literature, the focus has tended to be on the producer of travel services. This literature includes, for instance, the performance effects resulting from innovations in the hotel industry (Nicolau and Santa Maria, 2013) and the airline industry (Nicolau and Santa Maria, 2012). Yet, hotels and airlines – as well as other producers of service like cruise operators and car rental companies – are only one side of what is a two-sided travel market platform. Also, part of the platform, albeit in an entirely different role, are OTAs. In order to truly understand what constitutes platform success, one must also understand how OTA innovation contributes to performance. Following Hjalager's (2010) call for studying the effect of innovation actions on firms' performance, we examine the effect of innovation on the market value of OTAs. In addition, our study analyzes innovation types specific to two-sided markets so that potential differential performance related effects can be detected. In this respect, this study fills a gap in the literature by examining the performance related effects of innovations in a two-sided platform setting, in the context of OTAs. In particular, two-sided markets innovate primarily in two ways: i) same-side innovations, mainly used to build capabilities in managing users, that

include either producer-to-producer innovations or consumer-to-consumer innovations; and ii) cross-side innovations, used to increase the capabilities in the exchange management side, that include producer-to-consumer innovations. Note that while most studies on innovation have focused on the taxonomy provided by the Organization for Economic Co-operation and Development (Hjalager, 2010), our paper responds to the literature that calls for studies that estimate the effect of two-sided innovations on performance (McIntyre and Srinivasan, 2017) by connecting two-sided platform innovations to the market value of OTAs.

Literature review: OTAs and tourism distribution

Digital business models have reshaped many aspects of global commerce (Buhalis et al., 2019; Zentner and Spremic, 2021), including the distributional networks used. In a relatively short period of time, companies like Amazon, eBay and Netflix were successful in establishing extensive electronic distribution platforms connecting buyers and sellers. Tourism too has become increasingly platform-mediated in recent years with firms like Airbnb changing accommodation and experience landscapes (Capineri and Romano, 2021). In the travel booking market specifically, although travel agencies have existed since the 1800s (Ruiz and García, 2022), the market in which they operate was radically redefined with the entrance of OTAs as digital intermediaries. OTAs enable customers to use the internet to obtain information and book all kinds of travel products (Kim, Kim, and Han, 2007), and these firms enjoy considerable market penetration. In Western countries these intermediaries already dominate the market, but OTAs are also becoming increasingly popular in emerging economies (Mensah, Sakyi, and Forson, 2022).

Success on platforms in travel and tourism tends to depend, however, not merely on the capacity of the intermediaries to connect buyers and sellers, but on also on how much value the intermediary is able to add (see Cocola-Gant, Jover, Carvalho, and Chamusca, 2021). Having the right online standing is seen an important driver for financial success (Anagnostopoulou, Buhalis, Kountouri, Manousakis, and Tsekrekos, 2019). In this regard, OTAs are able to assist producers in the travel industry enhance their online presence, thereby ultimately contributing the bottom line. Past research shows that for hotels, distributing rooms through OTAs yields a return on assets (ROA) of 3.03 percent (Abdullah, Van Cauwenberge, Vander Bauwhede, and O'Connor, 2021). Smaller and medium sized enterprises tend to lag behind when it comes to technology adoption (Buhalis and Kaldis, 2008), and for these firms OTAs can be especially crucial in establishing a sufficient online presence.

OTAs create value in a number of ways. Certainly, they serve as a portal that provides consumers with considerable product variety (Liu and Zhang, 2014). Additionally, OTAs enhance product visibility and accessibility, reduce administrative as well as technical hurdles associated with online distribution, and provide efficient translation and payment systems (Abdullah et al., 2021). As intermediaries, OTAs are also to create value for the consumer by bundling different travel components and selling them at a lower price than if each component had been sold separately (Busby and Huang, 2022). Given that value creation is critical to the formation alliances (Buhalis and Crotts, 2000), it is not surprising that producers from nearly all major travel subindustries including hotels, airlines, car rentals and cruise lines partner with OTAs. Despite these advantages, producers are sometimes unwilling to list on OTAs especially when there is confidence the sale could be made directly on producer owned channels like hotel and airline websites. Usually, this is because listing on OTAs entails considerable expenses in the form of commissions. In fact,

commissions can be as high as 15–30 percent (Jørgensen, 2022). Complex pricing agreements between OTAs and producers also mean that the producer has less control over pricing across channels (Egger and Buhalis, 2011; Hayes and Miller, 2011). Therefore, notwithstanding the genuine cooperation along certain dimensions, a substantial level of competition also underlines the relationship between OTAs and producers in the industry.

At the same time, at least in some markets, OTAs face competition from traditional brick and mortar travel agents. In parts of Europe, brick and mortar travel agents are popular even today (García and Ruiz, 2022), and remain a source of competition for OTAs. Moreover, new and disruptive business platforms like Airbnb and the rise of the sharing economy also threaten the OTA business model. Furthermore, OTAs also face pressure from other types of disruptive business models like blockchain that promise to eliminate middlemen (see, for instance, Aghaei, Naderibeni, and Karimi, 2021). What is nonetheless apparent is that the popularity of OTAs has meant that relationships between key market members in the travel industry have been transformed (Chen and Kao, 2010; Eastes, 2010; Stangl, Inversini, and Schegg, 2016). In order to remain relevant in such multifaceted environments and withstand the competitive pressures, OTAs must constantly update existing practices such that value is created for consumers as well travel industry partners they serve. This is true whether OTAs operate under the agent model, wherein OTAs receive commissions from tourism providers based on sales, or the merchant model, under which OTAs add a margin to the price charged by service providers.

In order to quantify the impact of innovations on OTA performance it is useful to examine the platform relationships in the context of Rochet and Tirole's (2003) contributions to the theory of two-sided markets.

Innovation and performance on the two-sided OTA platform

Two-sided markets are platforms that link two separate classes of companies and/or customers together (Rochet, 2006). OTAs operate in such two-sided markets, and provide a platform where transactions are facilitated between travelers on one side and service providers, such as hotels and airlines, on the other (Bilotkach and Rupp, 2014). Although these platforms are not a novel phenomenon (Dietl, Grutter, and Lutzenberger, 2009), the use of two-sided market theory explains the nature of platform competition, and also provides a relevant theoretical and analytical framework conducive to measuring the effects of innovations. Previous studies in the tourism and hospitality literature have investigated the impacts of innovations by other players on the two-sided platform – such as hotels and airlines (see Nicolau and Santa Maria, 2012; Nicolau and Santa Maria, 2013) – but the effect of innovations by platform intermediaries like OTAs also warrants attention.

Other examples of two-sided markets include newspapers networks, which connect readers with advertising firms, and ridesharing company, Uber, which puts in contact drivers and passengers. With the creation of the internet, two-sided markets became especially widespread (Dietl et al., 2009). These markets having few assets to offer, but by building internet networks of producers and consumers they facilitate exchanges among them (Muzellec et al., 2015). Airlines, hotels and other producers of travel goods and services can sell their tickets/rooms either by using their direct methods such as their own websites or through indirect methods such as travel agents. Hotels and other tourism producers post their fares and rates on computer reservation systems, from where travel agents book tickets for their customers (Bilotkach and Rupp, 2014; Kim, Franklin, Philips and Hwang, 2020).

The main two advantages of these two-sided markets are their “capability in managing users who participate in the interaction and in managing exchange” (Zhang and Tang, 2019). As further elaborated later, a way for these markets to stay competitive and survive is to innovate these fundamental capabilities (Choudary, 2015; Parker, Van Alstyne, and Choudary, 2016). Both producers, i.e., hotels, airlines and other travel firms that list on OTAs, and consumers, i.e., prospective travelers are categorized as users of these two-sided platforms (Choudary, 2015), and they embody the supply and demand sides of these platforms. Because OTAs do not generate the services dealt with and exchanged on their platforms, the demand generated by the consumers on these platforms is met by the service providers on the other side of these platforms (Choudary, 2015). Therefore, OTAs are the enhancers of value of these platforms (Evans, 2003). Producers benefit on the supply side from the presence of OTAs as new customers are brought into the platform, whereas customers benefit on the demand side from the easier access to hotel related information (Gao and Bi, 2021).

The topic of innovation itself has, of course, extensively been studied in the literature. Drucker’s (1985) highly cited sources of innovation remain relevant even today – under this taxonomy innovations follow from chance, the incongruence of need with supply, market structures, necessity, demographics, changing perceptions and the unexpected. From this classification of sources of innovation, especially pertinent to the OTA platform is its unique market structure – usually an oligopolistic structure with few firms that enjoy considerable market share. This structure is explained by the presence of network effects (see also Armstrong, 2010)– the platform characteristic wherein the value that each side on the network gets depends on the number of users there are on the other side. In the OTA market, this suggests that consumers are drawn to the platform if numerous hotels, airlines, and other travel industry producers list on the OTA website.

On the other hand, producers are likely to list on particular OTA platform if consumers use that platform. As the intermediary, OTAs create value on the network by sustaining the links between the two sides. The few OTAs that do exist would typically have established networks large enough to dissuade new firms from being able to enter. The pursuit of larger networks is indeed a priority for OTAs and might explain why the OTA market experiences such frequent mergers and acquisitions. After years of consolidation, Jørgensen (2022) observes that at the global level only three main OTAs remain: Expedia Group (under which are Hotels.com, Vrbo, Hotwire.com, Travelocity, Orbitz, Trivago, CarRentals.com); Trip.com Group Ltd. (under which are Qunar, Ctrip, Trip.com, Skyscanner); and Booking Holdings (Booking.com, Priceline.com, Momondo, Kayak.com, Agoda. com, Cheapflights, OpenTable, Rentalcars.com).

Platform value is also enhanced via consumers commitment to the platform and their “continuous consumption” on that platform (Parker et al., 2016). To sustain the flow between producers and consumers, platforms must place additional efforts in managing users, where innovation also plays a fundamental role (Chakravarty, Kumar, and Grewal, 2014).

The relevance of innovation in OTAs’ two-sided market is reflected by the following factors:

- 1) Specific two-sided market functions. Efficient exchanges in the two-sided platforms are contingent on the following main functions (Parker et al., 2016): filtering, matching, facilitating, and curating. First, the filtering function guarantees the pertinence of the unit of value in the exchange (for example, the option that allows the users from each side to filter the services listed); second, the matching function enhances productivity by effectively connecting users (for example, a system that allows users to set matching criteria); third, the facilitating function creates exchange-friendliness and reduces exchange barriers (for example, a friendly-user payment system); and fourth, the curating function establishes the exchange quality (for example, a rating system). Two-

sided platforms must build their capability in managing exchange through the intermediation service (Grewal, Chakravarty, and Saini, 2010; Perren and Kozinets, 2018), and thus, they must keep innovating this service that originates from improving the four main exchanged functions listed previously (Parker et al., 2016).

2) OTA platforms face intense competition. Not only do OTAs have to compete with other OTAs but also with hotels, airlines, and other tourism providers (Angeloni and Rossi, 2020; Tseng, Wang, and Tsai, 2021), which prefer to sell through their own distribution channels to avoid commission fees. Although the dependence of hotels and airlines on OTAs is increasing (hotels listed on OTAs' platforms—especially independent hotels—benefit from an increase in their booking because OTAs' websites are more visible on the internet than hotels' direct booking websites (Anderson and Ming, 2017)), in order to survive in this highly competitive environment, OTAs must constantly reevaluate their current strategies and adopt new and innovative strategies. Also, in the context of two-sided markets with intense competition, the concept of “multihoming” applies, so that a customer has the ability to operate simultaneously on many separate platforms (Armstrong, 2006). In fact, Armstrong and Wright (2007) show that competitive bottlenecks emerge when one of the two sides do “multihoming” and the other does “singlehoming” because “platforms are viewed as homogenous by sellers but heterogeneous by buyers”.

Therefore, OTAs differentiating themselves from their competitors is key to avoiding the “multihoming” effect, resulting in a competitive advantage (Gawer and Cusumano, 2014), with the potential above-average profits. As a way to differentiate themselves, and be sustainable in the long run, these firms must innovate (McWilliams and Siegel, 2000).

Interestingly, despite this competition, rivals in the two-sided markets often cooperate to improve their capabilities (Gnyawali and Park, 2011). Previous studies such as Estrada, Faems, and De

Faria (2016) and Bouncken, Claub, and Fredrich (2016) have shown a positive effect of cooperation on innovation through the acquisition of external knowledge (Pereira and Leitaó, 2016), and the facilitation of crucial resources and capabilities access (Carayannis and Alexander, 1999). When companies face limits in their internal knowledge and resources that drive their innovation capabilities (Camison-Zornoza, Lapiedra-Alcamí, Segarra-Ciprés, and Boronat-Navarro, 2004), these external exchange of knowledge, capabilities, and resources play an important role in innovation (Brolos, 2009). Thus, this cooperation is not only valuable for sharing these resources, knowledge, and capabilities, but also it creates relationships to jointly expand novel resources and knowledge (Ritala, Golnam, and Wegmann, 2014), thereby improving the power of these two-sided platforms innovation (Bonel and Rocco, 2007).

Thus, because of the desirable enhancement of the specific two-sided market functions (filtering, matching, facilitating, and curating) and the intense competition, innovation becomes a critical element for the OTAs' survival and their attainment of long-term profits, with the subsequent positive effect on their performance. Consequently, the following hypothesis is stated:

H1: *Innovation has a positive influence on OTA performance as reflected in market value.*

Additionally, innovation in two-sided markets has some idiosyncrasies. Innovation actions can be categorized into two main types: same-side and cross-side innovation. Same-side innovations describe novel offerings that affect one of the two sides, i.e., the production behavior of sellers and the consumption behavior of buyers and are mainly used to build capabilities in managing users. Under this category, there are producer-to-producer and consumer-to-consumer innovations. As an example of a producer-to-producer innovation, Expedia in 2017, launched a new feature called Rev + to help hotels manage their properties and collect the price of hotel rivals automatically so that hotel managers could use it for planning price strategies. As for a consumer-to-consumer

innovation, Expedia in 2011 launched Expedia Rewards Loyalty Program to keep customers returning to the platform instead of booking through rival OTAs as well as airlines and hotels.

According to Choudary (2015), both producer-to-producer and consumer-to-consumer innovations positively affect the platform as they benefit producers as well as consumers. Landsman and Stremersch (2011) find that a producer-to-producer innovation may increase producers' multi-homing and switching cost, keeping producers on board, leading to an increase in subsequent value production. Furthermore, consumer-to-consumer innovations are found to increase customers' future consumption as a result of an increased consumer engagement (Algesheimer, Dholakia, and Herrmann, 2005).

However, these innovations can also harm the platform's performance. Bandyopadhyay, Barron, and Chaturvedi (2005) claim that hyper-competition among same-side users can arise from same-side innovations, and consequently drive producers or consumers to abandon the platform. Afuah (2013) examines how on each side, consumers and producers, can utilize these innovations for boosting their own profits, subsequently affecting negatively the platform performance. Furthermore, Grewal et al. (2010), observed that producer-to-producer and consumer-to-consumer innovations are sometimes utilized by producers as empowering tools, making them more influential users on these platforms, as well as encouraging more users from each side to come on board, creating more exchange. Sometimes, more does not mean better for the platform. Gradually, as the exchange magnitude becomes larger, the platform becomes more reliant on these users, causing them to negotiate an increasingly higher share of the platform's profits (Chakravarty et al., 2014), and derive more value from the platform. This is a consequence of the idea that the more productive the exchange on the platform, the more growth the platform experiences. The larger the

exchange is, the more important the users on the two sides are for these platforms as they are considered the fuelers of this growth.

Therefore, as the magnitude of these exchanges is larger, the more “protected” these users are when collecting additional gains from the platform since these platforms will lose more than gain when penalizing these users and scaring them away (Evans and Schmalensee, 2010). For instance, according to Algesheimer, Borle, Dholakia, and Singh (2010), users develop more selectiveness and effectiveness by utilizing the new tools these innovations offer, causing the decline of a platform’s gains. As previously mentioned, hotels could use the Expedia Rev + innovative tool to collect competitors’ information and be more efficient in their pricing strategies, and in that way become more influential users on Expedia.

Cross-side innovations, encompassing producer-to-consumer innovations, describe novel offerings that substantially modify the exchange roles in a platform’s interaction, which includes the functions of “filtering, matching, facilitating and curating” (Parker et al., 2016). As an example, Priceline introduced in 2013 a functionality to enhance searching on their iPad app providing better exchange through the platform. Often, producer-to-consumer OTA innovations are designed to keep up with changing consumer preferences. For instance, in response to the trend of consumers wanting the option of being able to cancel existing reservations and rebooking if prices drop, OTAs began to offer price monitoring and automated rebooking services (Masiero, Viglia, and Nieto-Garcia, 2020).

These innovations positively affect the platform’s performance as a result of different factors. First, because this type of innovation assures a large significant “value unit”, the rate of successful exchanges through the platform should increase (Parker et al., 2016; Zhang and Tang, 2019). Second, these innovations should result in user satisfaction as they may lower the transaction costs

between the consumers and the producers (Zhang and Tang, 2019). Third, these innovative actions are also expected to strengthen the platform's trust mechanism by providing these platforms a better control over users' behavior and over the exchanges (Afuah, 2013; Grewal et al., 2010). Fourth, producer-to-consumer innovations, which alter the facilitating and curating functions on the platform, are able to generate more interactions by fostering additional trades on the platform, thereby increasing platform performance (Grewal et al., 2010).

Unlike the negative effects of same-side innovations derived from a high growth of the platform, these cross-side innovations assist these platforms in managing the active exchanges that occur on those platforms. More specifically, producer-to-consumer innovation, when used to innovate the filtering and matching functions on OTA platforms, raises the relevancy of exchange, thereby increasing the platform's revenue (Grewal et al., 2010).

Consequently, considering that producer-to-producer and consumer-to-consumer innovations may bring about positive and negative effects on performance, they may neutralize each other, and taking into consideration the positive effect of the producer-to-consumer innovations on these platforms, we hypothesize that the effect of producer-to-consumer innovations is greater than the effect of producer-to-producer and consumer-to-consumer innovations.

H2: *Producer-to-consumer innovations have a greater impact on OTA performance as reflected in market value than producer-to-producer and consumer-to-consumer innovations.*

Data and methodology

To analyze the impact of innovation on the performance of OTAs and test hypothesis 1, the event study methodology is used to assess changes in market value based on the quantification of abnormal returns. Although the approach is well established in the broader business and social

science literature, the use of event analysis to examine the impact of new developments on firm performance has been growing in the travel scholarship (see for example, Zach, Nicolau, and Sharma, 2020; Nicolau and Sharma, 2022; Su and Chen, 2020; Corbet, Efthymiou, Lucey, and O’Connell, 2021). To test hypothesis 2 a regression analysis is conducted to identify differential performance effects of distinct two-sided market specific innovations.

Following Mackinlay’s (1997) approach, we implement the event study methodology to determine abnormal returns created by innovation announcements in OTAs.

Intuitively, in the event study methodology, we compare the performance of a firm—measured through the reaction in the stock market—on the day an announcement was made with the performance on that same day if that announcement had not been made. This way, we are able to capture the value that an announcement is adding (or reducing) to the market value of a firm. If the difference between the actual return and the expected return is positive, the announcement is considered to be positive; and negative, otherwise. Precisely, this difference—if significant—is used as dependent variable in a regression model to determine the explanatory factors.

More formally, based on the efficient market theory, this method suggests that stock prices fully depict a firm’s publicly available information. Therefore, only unpredictable information, in our case the release of innovation information, will alter and change stock prices (Fama, Fisher, Jensen, and Roll, 1969) and result in abnormal returns. Consequently, utilizing financial market data, this method examines the effect of a single event on a firm’s market value (Dyckman, Philbrick, and Stephan, 1984), by comparing normal to abnormal stock performance.

McWilliams and Siegel (1997) suggest a methodological procedure that begins with the identification of event dates, determining the length of the event window, detecting potential confounding effects, estimating the market model, and finally testing abnormal returns.

First, it is important to specify the date when the novel unpredicted information was received by the market. Uncertainty regarding the event date would make it complex to determine the time period during which to evaluate the effect of the event. In our context the event date is defined as the day the innovation information was first released to the public. For this reason, we conducted a keyword search in the Factiva database between 2000 and 2018 that includes the major OTAs trading on the US stock market, Expedia, Priceline, Orbitz, Trivago and Travelocity, followed by key words related to innovation such as “innovation”, “innovate”, “technological innovation”, “new product”, “new service”, “new process”, “new procedure”, “new system” or “new technology”. Initially, 61 announcements are detected; however, after removing announcements that were too close to each other, the final sample has 53 announcements distributed as follows: Expedia 27, Priceline 12, Orbitz 8, Trivago 3 and Travelocity 3. The announcements span more than three decades, and certainly the OTAs in the dataset have undergone mergers and acquisitions in this period. However, if the dates associated with each the announcements correspond to a time when the particular firm traded independently on the stock market, the OTA must, of course, be treated as independent.

Then, these innovations are categorized into the three types that are characteristic of the two-sided market: producer-to-producer, consumer-to-consumer, and producer-to-consumer innovations. The categorization was done by each of the authors independently for each announcement in the list, and then for the few announcements where discrepancies were observed between the categorization conducted by each author, a consensus was reached after a discussion.

Second, according to MacKinlay (1997), event windows must include a few days prior to and following the announcement, as “the periods prior to and after the event date may also be of interest” to capture leakages and potential delays. To guarantee that potential rumors and announcement leakages as well as delays in processing the information are accounted for, this study uses a 5-day period starting at $t = -2$ and ending at $t = +2$.

To calculate normal returns, we retrieve stock market data from the Bloomberg database and estimate the market model proposed by Sharpe (1963) over a period of 150 days preceding to the event. This model is defined by:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where:

R_{it} = firm i 's daily return on day t

R_{mt} = market index return on day t

α_i = constant reflecting market-independent returns of firm i

β_i = effect of the market returns on firm i

ε_{it} = error term following an autoregressive conditional heteroskedasticity model GARCH (1,1)

The generalized autoregressive conditional heteroskedasticity model (GARCH) (Bollerslev, 1986) captures the momentum in conditional variance hit (Lamoureux and Lastrapes, 1990). Being an autoregressive model, it estimates the present variance relying on previous squared observations and historical variance. The conditional variance is illustrated as:

$$h_{it} = c_i + \lambda_i \varepsilon_{it-1}^2 + \gamma_i h_{it-1}$$

where $\varepsilon_{it} = h_{it}^{1/2}\eta_{it}$, where $\varepsilon_{it} / \varepsilon_{it-1}, \varepsilon_{it-2}, \dots \sim N(0, h_{it})$, and η_{it} is independently and identically distribute with $E(\eta_{it}) = 0$ and $E(\eta_{it}^2) = 1$. Finally, c_i , λ_i , and γ_i are parameters to be estimated.

Next, abnormal returns are computed by the expression:

$$AR_{it} = R_{it} - (a_i + b_i R_{mt})$$

where, for a period of t days before the event, a_i and b_i are the estimated parameters from the market model.

To test the significance of the abnormal returns, Pilotte's (1992) cross-sectional test is used, which is defined as:

$$t = \frac{\frac{1}{N} \sum_{i=1}^N AR_i}{\sqrt{\frac{1}{N(N-1)} \sum_{i=1}^N \left(AR_i - \sum_{i=1}^N \frac{AR_i}{N} \right)^2}}$$

where N is the number of announcements and AR_i is the abnormal return on each day of the event window.

Results

Table 1 shows the effects of innovation announcements on OTA performance. There is a positive and statistically significant ($p < 0.05$) reaction on the same day an innovation is announced. In particular, abnormal returns of 1.05% are detected. On day 2 there is also a positive and significant reaction of 1.01%. This result supports Hypothesis 1 that innovation has a positive influence on OTA performance. Innovation announcements signal to the market that the OTAs making news has the ability to differentiate their products and services from competitors, earning a competitive

advantage in line with Gawer and Cusumano (2014); this competitive advantage should in turn lead to greater profits, and thus to a higher market value.

Date	Abnormal returns	Pilotte's test (p-values)
-2	-0.0118	0.4046
-1	-0.0014	0.7385
0	0.0105	0.0407
1	0.0037	0.5207
2	0.0101	0.0737

Table 1: Effect of innovation on OTA market value.

To test the differential effects of the two-sided market specific innovations we run a regression model where the dependent variable is the abnormal returns of each announcement and the independent variables are the two-sided market specific innovations: same-side with producer-to-producer and consumer-to-consumer innovations the former being used as the base reference to estimate the model and cross-side with producer-to-consumer innovations. The results of the parameter estimates are as follows (t-statistics in parentheses):

$$AR_i = -0.0205 (-1.379) + 0.0249CC (1.3717) + 0.0365PC (2.1710)$$

The results show that the parameter associated with producer-to-consumer innovations is significant and positive, meaning that this parameter is higher than the parameters associated with consumer-to-consumer and the base reference producer-to-consumer. This result supports Hypothesis 2 that producer-to-consumer innovations have a greater impact on OTA market value than producer-to-producer and consumer-to-consumer innovations as the expected positive effect

of producer-to-consumer innovations show a clearer signal to the market than potentially neutralizing effects of producer-to-producer and consumer-to-consumer innovations.

Concluding discussion

Although the topic of innovation has been extensively studied in the travel literature (see for instance, Williams and Shaw, 2011; Rodriguez, Williams, and Hall, 2014; Williams, Rodriguez, and Makkonen (2020); Buijendijk, van Heiningen, and Duineveld, 2021; Scuttari, Pechlaner, and Erschbamer, 2021) comparatively little attention has been paid to innovation in the context of innovation in OTAs and other distributional intermediaries. OTA firms are significant actors in today's hospitality and tourism world. However, their risk of obsolescence is high if they are not capable of implementing innovations related with the management of users and exchange. Through an econometric event study used to ascertain firm performance, this study shows that innovation has a positive effect on the market value of OTAs. Specifically, the empirical application detects a positive 1.05% statistically significant ($p < 0.05$) reaction on the same day OTAs announce the introduction of an innovation.

Also, under the assumption that not all innovations affect the market value of OTAs in the same way, this article tests the differential effects of two-sided markets specific innovations, namely, same-side innovations (producer-to-producer and consumer-to-consumer) and cross-side innovation (producer-to-consumer) and finds that producer-to-consumer innovations have greater impact on the market value of OTAs than producer-to-producer and consumer-to-consumer innovations.

Regarding theoretical implications, this study fills a gap in the literature by providing a theoretical understanding of innovations in a two-sided platform setting, in the context of OTAs. While the current literature is mainly focused on the innovation types of the Organization for Economic Cooperation and Development (Hjalager, 2010), our article responds to the literature that calls for studies that estimate the effect of two-sided innovations on performance (McIntyre and Srinivasan, 2017) by connecting two-sided platform innovations to the market value of OTAs. Moreover, as we find that producer-to-consumer innovations have greater impact on the performance of OTAs than producer-to-producer and consumer-to-consumer innovations, this result suggests that OTAs' ability to enhance exchange is a key driver of performance for two-sided platforms.

Derived from this, a critical managerial implication is that OTA managers ought to further emphasize the improvement of producer-to-consumer innovations to develop the fundamental ability to manage exchange. As these innovations are expected to increase user satisfaction via reduction of transactions costs between consumers and producers, innovative actions aiming at facilitating the exchange between consumers and producers should be reinforced. Additionally, producer-to-consumer OTA innovations help enhance trust on the platform, leading to a larger number of interactions and, in turn, getting an increased number of trades on the platform. Accordingly, actions that can be proposed may consist of offering services that facilitate the identification of ideal rates tailored to a consumer's characteristics, and that automatically identify reductions in prices and cancel previous reservations and rebook at the new rates.

This study examines, for the first time, the effect of OTA innovations on market value by quantifying the impacts of P2C, P2P and C2C innovations. Still, additional work is necessary. Accordingly, further research could look into other platforms so that these results are confirmed. As Airbnb is another platform in the hospitality industry that is based on the two-sided market

business model, an interesting approach would be to analyze innovation in this two-sided platform, which could certainly expand our understanding of the effect of innovation on two sided markets. At the same time, it would be worthwhile to look at the impact of the rise of the Airbnb on OTA performance. Many of the papers relating to the effects resulting from emergence the sharing economy have looked at hotels (García and Ruiz, 2022b), but an understanding of how the OTA business model has been altered could help guide OTA strategy in the future. It is also likely that in the upcoming years more OTAs could look to tap into the sharing economy market, by letting private homeowners list directly on OTA portals. In order to succeed in this space, OTAs might look at what makes portals like Airbnb attractive to consumers (see, for example, Qiu, Lin, Feng, Peng, and Fan, 2020; Yao, Qiu, Fan, Liu, and Buhalis, 2019), but also how OTAs might differentiate themselves from firms like Airbnb. Lastly, advances in mobile technology permit more than simply traditional reservation and information search (Lei, Wang, and Law, 2021). The degree to which OTAs are able is likely to be a determinant of future OTA success, and presents an exciting avenue for research.

Additionally, in line with the findings of Williams, Rodríguez and Skokic (2021) about the perceptions of risk and uncertainty throughout the innovation process, it would be insightful to use the volatility in the stock market as a proxy of risk and uncertainty to identify how these notions evolve during the introduction of the innovation. In addition, it would be interesting to investigate what kind of innovations OTAs are going to be interested in pursuing in the upcoming years. Social media and analysis of big data are useful to understand tourist preferences (Chen, Beckin and Stantic, 2021), and one certainly expects that part of the value they create will depend on how effectively they are able to harness these innovations.

The analysis of the effect of OTA innovations on their market value in the framework provided by the two-sided market shows that producer-to-consumer innovations have a greater effect on OTA performance than producer-to-producer and consumer-to-consumer innovations. Consequently, a fundamental managerial implication is that exchange management is an area to be enhanced when innovating in two-sided platforms.

While the study is, by design, restricted to those major OTAs that are trading on the stock market, a limitation is that the empirical application only looks into the US stock market. To confirm the results obtained, the effect of the two-sided market specific innovations should be examined in other stock markets. This, however, we leave for future research.

An additional area of future research in this strand of the literature pertains to whether OTA innovations have changed as a result of the Covid-19 pandemic. The Covid-19 crisis had a significant negative impact on the travel industry (Karabulut, Bilgin, Demir, and Doker, 2020; Sharma and Nicolau, 2020), and the ensuing situation of crisis will necessarily bring about changes in business operations and management approaches (Gümüs, Geçti, and Yılmaz, 2020). Tourism supply chains have also been impacted (Bire and Nugraha, 2022). The crisis was unprecedented, and firms needed to re-evaluate their current practices and come up with innovations to protect their consumers' health and restore their confidence. In this environment, organizations including OTAs had to innovate; innovation that would help them to gain their competitiveness. In this regard, future research would help shed light on the specific innovations that OTAs undertook in the midst of the pandemic, and assess how effective these pandemic specific innovations were.

Chapter 4: Free Delivery or Fee Delivery? Analyzing the Impact of Free Delivery on Consumer Purchasing Behaviors: The Zero-Price Model in the Restaurant Industry

Abstract

With this unprecedented increase in food delivery demand due to the new consumption habits of individuals, delivery pricing is an issue to consider keeping consumers happy and continuously demanding this service. Research in economics and in service marketing have described how consumers do recognize the “free” under a product’s price differently. This pricing approach is based upon that widespread notion that providing free goods or services to customers adds value to them and so increases their desire to buy. In this paper, we study the Zero price model on a multicomponent product with Food being the first component (where its price is always positive) and the delivery service as the second (where its price will eventually hit the zero-price tag). Elaborating more on previous studies and filling their gaps, we will be dividing the zero-price model into three scenarios: The true free scenario, the true free scenario with different discounts, and the fake-free scenario as each one is expected to yield different consumer behaviors in the process but all should act similarly when the price hits the “free” tag.

Keywords: Zero price model, delivery, restaurants.

Introduction

The year 2019 was one of the most devastating years to end a decade with. In that decade end year, a global pandemic known as COVID-19 erupted in China and expanded exponentially to the whole globe in the start of our current decade, the 2020s. The decade we are presently living in has started differently than other decades we know about. The new normal was something we could never imagine to be possible. As COVID-19 is a highly transmissible virus among people, the new safe recommended by the World Health Organization (WHO, 2020) was and still is to wear a mask in public spaces, social distancing, isolation, and many more preventative measures to lower the possibility of transmitting this virus (Wilder-Smith and Freedman, 2020). Therefore, the conventional restaurant business has suffered greatly as a result of the COVID-19 pandemic, as fewer clients expect to utilize public services. However, even though COVID-19 had a damaging effect on the supply and demand of the restaurants, the pandemic had enhanced the makeover of the restaurant industry to become more homogeneous to the new consumption habits of individuals. To survive this pandemic and to sustain viable development, the restaurant industry is developing from the traditional in store service to the online-to-offline service (Zhao and Bacao, 2020). In a study conducted in China from the end of February to early March 2020 by the Meituan research institute (2020) that could also mirror the consuming habits by individuals all around the world, 71.7% were using food deliveries and 41.6% preferred this type of service for purchasing daily supplies.

With this unprecedented increase in food delivery demand, delivery pricing is an issue to consider keeping consumers happy and continuously demanding this service. Referring to one of the most basic principles of economics known as the law of demand, when the price of a product decreases, the demand of that product increases monotonously. But when the price of that product decreases

to the zero mark, something fundamental changes. Research in economics such as (Ariely, 2008) and in service marketing such as (Nicolau and Sellers, 2012) have described how consumers do recognize the “free” under a product’s price differently. Experiments in these latter studies show that individuals regard “free” products as having greater advantages just because they are “free“. Suppose a scenario wherein customers gain an advantage by owning an item; this advantage is often a combination of the value gained from owning the good as well as its price. The advantage of the good grows as the price of the product lowers, making the product a much more appealing option. However, while this decline is usually believed to be linear, there is a discontinuity once the product reaches a price of nil (Shampanier, Mazar, and Ariely, 2007, and Nicolau and Sellers, 2012). This influence has been observed in a number of different settings, including hotels and free breakfast (Nicolau and Sellers, 2012), airfare (Nunes and Park, 2003), and candy choice (Shampanier, Mazar, and Ariely, 2007). To attract customers or induce alterations in client preferences, many businesses nowadays provide free items or services (Caplan, Jackson-Smith, and Marquart-Pyatt, 2010). Free software trials and complimentary hotel facilities are two such examples. This pricing approach is based upon that widespread notion that providing free goods or services to customers adds value to them and so increases their desire to buy (Shampanier, Mazar, and Ariely, 2007). In the service sector, which includes hotels, such an approach is common. Amenities such as breakfast or Wi-Fi can be provided for free.

This impact has been validated by research, which have discovered that a zero price impacts value and may be adapted to two-component services and goods, where a first component (hotel room) is pooled with another component (breakfast) (Nicolau and Sellers, 2012). More precisely, Nicolau and Sellers ensure that, in a package, the free good provides extra value. In their investigation, individuals were given the option of staying in a fictional less-known, cheaper hotel with free

breakfast or staying in a superior, familiar Spanish hotel without free breakfast. Their findings revealed that including a free component in a package adds additional value, which is greater than an equivalent price decrease.

On the other hand, shifting to a zero price from a positive one can often result in a drop in spending instead of the predicted gain from consumption till the marginal utility is equivalent to zero, as Gneezy and Rustichini (2000 a, b) show. This could be explained with Fiske's Relational theory (1992). It states that when money is involved, people's values and standards are directly related to the cost-benefit assessments and trade norms of the market; nevertheless, in other circumstances, trades are viewed as societal, and individuals apply social standards to the trade. In different terms, customer desire for free items is primarily driven by non-market factors such as self-image, prestige, and normative considerations, all of which may limit purchase. However, unlike the public nature of traditional purchases, the process of ordering food delivery is typically done in private through personal devices, which makes it less susceptible to the effects of cost-benefit assessments and market norms.

Similar to Nicolau and Sellers (2012) paper, the food and the delivery service can also be regarded as a multicomponent product with Food being the first component and the delivery service as the second. Food prices are hard to change, however delivery prices are easier and can be utilized as a marketing tool to attract consumers. Moreover, Nicolau and Sellers (2012) ensure that adding a free component to a package adds value. Is this effect still present if a food meal has a positive price however the delivery cost is zero? If the result is affirmative, the ramifications for restaurant companies, the majority of which deal with multicomponent items, would be quite important when considering promotions. Moreover, these strategies could also be of importance in other industries that also utilize delivery. However, in Nicolau and Sellers (2012) study, the price of the breakfast

component decreases equally between the two hotels. This is a fundamental experiment to conduct in regards of delivery prices. However, what if the prices decrease differently; is a smaller reduction with a price of zero preferable to a greater reduction without the free price tag? Moreover, what if the discount in the delivery price is actually not free, but instead hidden in the price of the first component, the food? Given the ubiquity of fake-free offers, as well as the difference between genuinely free and non-free deals, more studies are required in order to explain how customers react to them. Fake-free offers elicit a slew of inquiries that are not relevant to really free offerings. Do customers, for example, respond logically to fake-free offers? Or do customers just dismiss and ignore, considering them as if they were actually free? To study this behavioral economics dilemma, we will utilize in this study experimental economics.

Literature review

Zero price model

Elaborating more on previous studies and filling their gaps, in this current study we will be dividing the zero-price model into three scenarios as each one is expected to yield different consumer behaviors in the process but all should act similarly when the price hits the “free” tag.

Truly free

Mirroring Nicolau and Sellers’ (2012) procedure, to see if people have a favorable overreaction to items with a free component, we investigate if people are more likely to choose these items when the component is free vs when it is inexpensive, in a situation when they are foregoing a preferred choice, and its cost has dropped by the same percentage as the free component.

To adapt the zero-price model to our multicomponent context, we will consider a traveler that just arrived to an American city that he/she never visited before and has just checked in an hotel room and is feeling tired and very hungry. This individual is not willing to take any mean of transportation to go eat as he/she are very tired and just want a meal in their room. This individual is checking the promotions of two close by restaurants that have a delivery service directly to their room:

Restaurant A with price P_a and value V_a

Restaurant B with price P_b and value V_b

Only when V_a is larger than P_a that the individual will choose restaurant A and only when V_b is larger than P_b that the individual will choose restaurant B.

As takeaway and dine-in are not an option for the individual, delivery is the only way this individual will receive his food. However, the value of the delivery cannot be added to the value of the food as the delivery component has its own value in the consumer's decision process. Therefore, we split up the value and price of each option into restaurant (r) and delivery (d) value and price:

For restaurant A: V_{rA} and P_{rA} and Restaurant A delivery as V_{dA} and P_{dA} .

For restaurant B: V_{rB} and P_{rB} and Restaurant B delivery as V_{dB} and P_{dB} .

Assuming that the value of the meal and the delivery are simply additive together in a straightforward linear form, and that restaurant A is the favored option for most people in such a way that, based on the preceding mentioned disparities, the following information is retrieved:

$$V_{rA} + V_{dA} > P_{rA} + P_{dA}$$

$$V_{rB} + V_{dB} > P_{rB} + P_{dB}$$

If customers are logical, they will select restaurant A over restaurant B if:

$$(V_{rA} + V_{dA}) - (P_{rA} + P_{dA}) > (V_{rB} + V_{dB}) - (P_{rB} + P_{dB})$$

$$(V_{rA} + V_{dA}) - (P_{rA} + P_{dA}) > V_{rB} - P_{rB}$$

$$V_{rA} - P_{rA} > (V_{rB} + V_{dB}) - (P_{rB} + P_{dB})$$

$$V_{rA} - P_{rA} > V_{rB} - P_{rB}$$

If the price of delivery in both restaurants is reduced by the same amount ε , one would anticipate the more costly option to gain market share. Such that, who chose the expensive restaurant A will proceed to do so, while those who chose the lower priced restaurant B will discover that restaurant A is more affordable. As a result, the following disparity emerges:

$$\text{Inequality 1: } (V_{rA} + V_{dA}) - (P_{rA} + P_{dA} - \varepsilon) > (V_{rB} + V_{dB}) - (P_{rB} + P_{dB} - \varepsilon)$$

Conversely, per the zero-price model, whenever the price decrease in delivery for both options is equivalent to the cheapest price, $\varepsilon = P_{dB}$, delivery for restaurant B becomes free, boosting its intrinsic value by α :

$$V_{rB} + (V_{dB} + \alpha) > 0$$

Despite the fact that the costly alternative has a bigger gap in value and price than previously, the zero-price model predicts that consumers would choose the less expensive choice over the more expensive one. It will take place if the subsequent inequality stands:

$$\text{Inequality 2: } (V_{rB} + (V_{dB} + \alpha) - P_{rB}) > (V_{rA} + V_{dA}) - (P_{rA} + P_{dA} - P_{dB})$$

Different decrease to truly free

What if the reduction ε in the price of the delivery in both restaurants is not the same? What if the reduction ε_1 in the delivery price of the more expensive restaurant A is higher than the reduction ε_2 in the delivery price of the cheaper restaurant B? Would the Zero price model still work? Similar to the first scenario, one would anticipate the more costly option to gain market share. Such that, who chose the expensive restaurant A will proceed to do so, while those who chose the lower priced restaurant B will discover that restaurant A is more affordable. As a result, the following disparity emerges:

$$\text{Inequality 3: } (V_{rA} + V_{dA}) - (P_{rA} + P_{dA} - \varepsilon_1) > (V_{rB} + V_{dB}) - (P_{rB} + P_{dB} - \varepsilon_2)$$

Conversely, per the zero-price model, whenever the price decrease in delivery for both options is equivalent to the cheapest price, $\varepsilon_2 = P_{dB}$, delivery for restaurant B becomes free, boosting its intrinsic value by α :

$$V_{rB} + (V_{dB} + \alpha) > 0$$

In the first scenario, the reductions were always similar. However, in this scenario the gain from choosing restaurant A than choosing restaurant B is much higher for the individual.

Is a smaller reduction with a price of zero preferable to a greater reduction without the zero price? Would the individual make a reasonable decision and select Restaurant A, which offers a greater discount? or does the person overlook and ignore the greater gain in favor of the free product with a lesser gain but a free product value attached?

If the individual decides rationally and chooses restaurant A with the higher discount without the zero price the following inequality will not hold:

$$\text{Inequality 4: } (V_{rB} + (V_{dB} + \alpha) - P_{rB}) > (V_{rA} + V_{dA}) - (P_{rA} + P_{dA} - \epsilon_1)$$

But if the individual disregard and ignore this higher monetary gain and go for the free product with lower monetary gain, the previous inequality (4) holds.

Fake-free

Similar to the other sections, we focus on the basic decision taken by a consumer to purchase a meal via delivery, but we test the zero-price model in a completely different way. Under this experiment the total price paid by the consumer does not change, however, the delivery price in restaurant B decreases until it hits the zero-price mark. If the price of food in restaurant A is P_{rA} and the price of the delivery service is P_{dA} , and the food in restaurant B is P_{rB} , and the price of the delivery service is P_{dB} then the total price is P_A and P_B . Furthermore, if the discount is ϵ , when P_{dA} and P_{dB} decrease by ϵ , P_{rA} and P_{rA} increase by ϵ . Therefore, total price P_A and P_B will be intact.

$$P_A = (P_{rA} + \epsilon) + (P_{dA} - \epsilon)$$

$$P_B = (P_{rB} + \epsilon) + (P_{dB} - \epsilon)$$

Will the consumer respond to fake-free offers rationally by looking at the total price and understand that the price did not change? If so, one would anticipate the more costly restaurant A will keep its market share. Those who chose the more costly restaurant A will continue to do so.

Or do customers just dismiss and ignore, considering them as if they were actually free by only looking at the delivery price?

Consumers place a high value on really free offerings, according to previous studies (Shampanier, Mazar, and Ariely 2007). However, no studies have been done to see if they appreciate fake-free offerings in the same way. Fake-free offers elicit a slew of inquiries that are not relevant to really

free offerings. Do customers, for example, respond logically to fake-free offers? Or do customers just dismiss and ignore, considering them as if they were actually free? According to Shampanier, Mazar, and Ariely (2007) individuals are excessively drawn to zero priced items and that irrational decision reversals may happen whenever the price of an item is decreased to zero.

The key question for this section is whether customers place a comparable premium on fake-free offerings. Fake-free deals are comparable to really free offers in terms of presentation (i.e., they are displayed to customers as "free"), but actually diverge in one key manner. In this case the decrease in the price of the delivery component will be added to the food price. Because of this increase in the food price, fake-free deals should then be treated differently than really free offers, with customers evaluating the cost against the value of the deal. According to Gooding and Kinicki (1995) given the equivocal nature of fake-free deals, as well as the reality that this uncertainty can result in people generating attributions, we believe that fake-free offerings initiate an attributional cycle that affects how customers react to these offerings. Furthermore, a significant number of studies have discovered that attributions could considerably influence conduct overall (Weiner, 1985) and, more particularly, in the area of consumer habits (Weiner, 2000). Even though individuals may assign a variety of numerous attributions to fake-free offerings, we believe that in general, individuals assign positive or neutral attributions to them. In particular, whenever individuals are subjected to fake-free offerings, they are more willing to concentrate on the offer's highly visible "free" element (Chandran and Morwitz 2006). Considering that individuals are attracted to free deals (Shampanier, Mazar, and Ariely 2007), we believe that individuals will form optimistic or neutral attributions about why the restaurant is giving the offer as a result of this disproportionate attention to the "free" component (Morgan, Mullen, and Skitka 2010). We believe

that individuals will see fake-free offerings as fair as a result of these neutral or positive attributions, and will interact with these offerings as free (Darke and Dahl 2003).

This should follow the zero-price model, that whenever the price decrease in delivery for both options is equivalent to the cheapest price, $\varepsilon = P_{dB}$, delivery for restaurant B becomes free, boosting its intrinsic value by α :

$$V_{rB} + (V_{dB} + \alpha) > 0$$

and again inequality 2 from the previous scenario will hold:

$$\text{Inequality 2: } (V_{rB} + (V_{dB} + \alpha) - P_{rB}) > (V_{rA} + V_{dA}) - (P_{rA} + P_{dA} - P_{dB})$$

Data collection: Assessing the impact of free delivery on consumer purchasing behavior.

To collect data for our survey, we used Amazon Mechanical Turk (MTurk) as our platform for conducting the survey. This platform provides a large pool of participants from the US, allowing us to reach our target sample size of around 200 participants.

We posed a scenario to 200 participants in the US, imagining they have just checked into a hotel room in Charlotte, NC and are feeling tired and hungry. They are unwilling to venture out and prefer to have a meal delivered to their room. The participants were asked to consider the promotions offered by two nearby restaurants that offer delivery services and chose one: Five Guys or Fasttastic Burgers. The first restaurant mentioned is a well-established chain, while the second is an unknown establishment created for the purpose of this experiment.

The creation of the second, unknown restaurant serves to establish Five Guys as the pricier and more desirable option, providing participants with added incentive to make choices that challenge the expected impact of free delivery.

True free experiment: Description:

Experiment 1 consists of three conditions, as outlined in Table 1. The first condition is a cost-based condition in which participants are presented with two options on special offer: "Five Guys (\$16) plus delivery (\$6)" or "Fasttastic Burgers (\$12) plus delivery (\$4)." The purpose of this condition is to determine if participants, who may prefer Five Guys, choose the cheaper alternative, Fasttastic Burgers, due to the higher cost of the former. The second condition is also a cost-based condition, where the food prices remain unchanged, but the delivery prices are reduced by \$2. This condition serves to verify that Five Guys is indeed the preferred alternative. The third condition is the free delivery condition, in which the delivery for Fasttastic Burgers is made free through a further \$2 reduction. It is important to note that the differences in restaurant food prices are intentionally kept small to avoid having participants choose a different restaurant for a few dollars and to ensure the fulfillment of inequality 1. The primary objective of the experiment is to examine inequality 2, given the fulfillment of inequality 1.

True free with different discounts experiment: Description:

Experiment 2 consists of three conditions as well, as outlined in table 2. Similar to experiment 1, the first two condition serves to determine if participants, who may prefer Five Guys, choose the cheaper alternative, Fasttastic Burgers, due to the higher cost of the former and then verify that Five Guys is indeed the preferred alternative. The inclusion of a third condition permits examination of the relative worth of a \$2 discount resulting in free delivery compared to a \$4

discount that falls short of conferring free delivery, despite its greater monetary value. The primary objective of this experiment is to examine inequality 4.

Fake free experiment: Description:

Experiment 3 consists of three conditions, as outlined in Table 3. In contrast to the first two experiments, in Experiment 3, a reduction of \$2 in delivery price is paired with a \$2 increase in the price of food in both restaurants, resulting in no change in the overall price of food and delivery. The first two conditions serve the purpose of ensuring the validity of inequality 1, as well as prompting participants to opt for their preferred restaurant based on its greater perceived value. Condition 3 is designed to investigate the impact of free delivery pricing on consumer purchase behavior, even in instances where the total cost of food and delivery remains unaltered, by increasing the cost of food by \$2 in both restaurants and decreasing the delivery price by \$2, effectively rendering the delivery price of the original restaurant preferred by participants at \$2, and that of the alternative restaurant at zero.

Data analysis

The T-test will serve as a statistical instrument to examine participant responses linked to the experiments and ascertain the statistical importance of the discrepancies in proportions among conditions. The T-test will be carried out separately for every experiment, with each analysis's distinct objectives varying based on the experimental circumstances.

The conditions' proportions within all three experiments will be contrasted using the T-test to establish whether a statistically meaningful distinction exists between them. Additionally, the assumptions of data normality, homoscedasticity, and independence will be assessed to guarantee the T-test analysis's validity.

Experiment 1: True free (Table 1)

	Five Guys		Fasttastic	
Condition 1	Food	16\$	Food	12\$
	Delivery	6\$	Delivery	4\$
Condition 2	Food	16\$	Food	12\$
	Delivery	4\$	Delivery	2\$
Condition 3	Food	16\$	Food	12\$
	Delivery	2\$	Delivery	Free

Experiment 2: True free with different discounts (Table 2)

	Five Guys		Fasttastic	
Condition 1	Food	16\$	Food	12\$
	Delivery	7\$	Delivery	4\$
Condition 2	Food	16\$	Food	12\$
	Delivery	5\$	Delivery	2\$
Condition 3	Food	16\$	Food	12\$
	Delivery	1\$	Delivery	Free

Experiment 3: Fake-free (Table 3)

	Five Guys		Fasttastic	
Condition 1	Food	16\$	Food	12\$
	Delivery	6\$	Delivery	4\$
Condition 2	Food	18\$	Food	14\$
	Delivery	4\$	Delivery	2\$
Condition 3	Food	20\$	Food	16\$
	Delivery	2\$	Delivery	Free

Results

The main findings from the three experiments consistently indicate that Five Guys is the preferred restaurant choice among participants, regardless of the delivery pricing conditions. This suggests

that the consumer's perceived value of the well-established brand remains the dominant factor in their decision-making process.

Experiment 1: In this experiment, the demand for Five Guys increased even when both restaurants reduced their prices, and Fasttastic Burgers offered free delivery (see figure 1). The results suggest that customers are unwilling to compromise on their preferred brand when it comes to food. They prioritize quality, familiarity, and reputation, opting for the well-known Five Guys brand, even when faced with the prospect of free delivery from Fasttastic Burgers. It highlights the importance of brand recognition and trust in the food industry, which ultimately influences customer decision-making.

Experiment 2: While the same pattern was observed in this experiment, it was interesting to note that when customers perceived the delivery service's price as too high, they were slightly more likely to favor the unknown Fasttastic Burgers brand. However, as soon as the delivery price decreased, the same preference for Five Guys observed in Experiment 1 was reinstated (see figure 2). This finding implies that although consumers have a strong preference for well-established food brands, they might be willing to consider alternative options when the perceived cost of delivery becomes excessively high. Nevertheless, once the delivery cost is reduced, they return to their original brand preference.

Experiment 3: The results from this experiment showed that the "fake free" delivery tactic did not work on the participants. Five Guys remained the preferred option across all three conditions, indicating that customers were not easily fooled when it came to their food choices (see figure 3). This finding demonstrates that consumers value transparency and straightforward pricing strategies and are not swayed by manipulative offers that seek to mislead them. It also reinforces

the importance of trust and brand reputation in the food industry, as customers continue to prioritize these factors over deceptive promotions.

The results from all three experiments suggest that consumers prioritize their preferred food brand, even in the face of free delivery or discounts from lesser-known competitors. This preference for established and familiar food brands highlights the importance of quality, trustworthiness, and reputation in the food industry, with consumers unwilling to sacrifice these factors for cheaper or free delivery alternatives. Moreover, the experiments reveal that customers value transparency and fair pricing, and they are not easily swayed by manipulative offers.

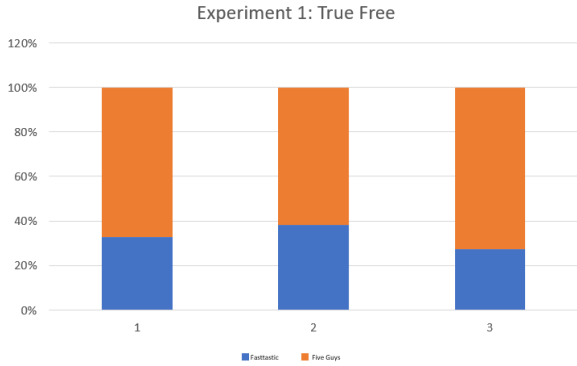


Figure 1: The True Free Experiment



Figure 2: True Free with different discounts Experiment

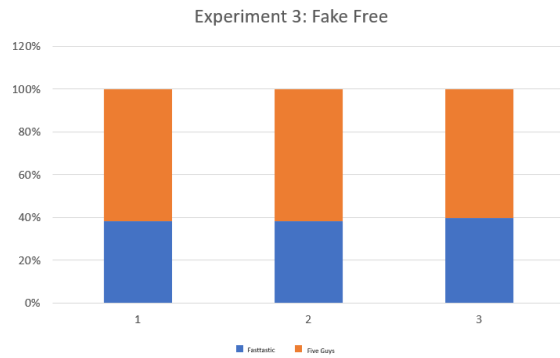


Figure 3: The Fake Free Experiment

Concluding discussion

The results from the experiments, suggesting that consumers prioritize established food brands over lesser-known competitors, can be explained through a combination of uncertainty, intangibility, and cognitive ease.

Intangible products, like services, cannot be tried before purchase, which inherently introduces uncertainty for consumers (Rexfelt and Hiort af Ornas, 2009). In the case of food, this uncertainty is further heightened by the possible health consequences of consuming low-quality products (Clark, Springmann, Hill, and Tilman, 2019). Consequently, consumers rely on brand reputation and trust as proxies for quality and safety (Devine and Halpern, 2001; Hansen, Samuelsen, and Silseth, 2008; Rose and Thomsen, 2004), making them more resistant to potentially compromising their dining experience for the sake of cost savings or promotional offers.

As referenced in the article, this research builds upon the concept explored in the study of complimentary hotel breakfasts conducted by Nicolau and Sellers (2012). However, in the hotel industry, the primary focus for consumers is the quality of the room and the comfort of the bed, with secondary aspects like breakfast being of lesser importance. Since a free breakfast does not impact the main aspect of their stay, which is the room, consumers may be more willing to take

advantage of such offers. This distinction highlights that consumers prioritize the core hotel experience over peripheral services, and as a result, are more open to promotional deals related to secondary aspects, such as free breakfast, without compromising their overall satisfaction with the hotel stay. This situation contrasts with the restaurant free delivery offer, where the primary focus for consumers is the food itself, which is directly tied to the quality, taste, and safety of the products offered by the restaurant. In this case, a free delivery promotion may not be as effective in enticing customers to choose a lesser-known food brand, as the potential risks associated with food quality and safety remain the top concern. Consumers tend to prioritize these factors over the convenience of free delivery (Bai, Wang, Yang, and Gong, 2019), as the dining experience is directly linked to the core product being offered. Thus, the difference between hotel services and restaurant free delivery offers lies in the core aspects of the experiences being offered. In the hotel industry, a free breakfast does not affect the primary concern of consumers, which is the room and bed quality, making such offers more appealing. Conversely, in the restaurant industry, the free delivery offer is related to the core product, the food, which carries inherent risks and uncertainties. Therefore, consumers are more cautious and tend to prioritize well-established brands with proven quality and safety, even when faced with free delivery promotions.

On another note, cognitive ease (Kahneman, 2011) could influence consumers' decision-making process in several ways. Cognitive ease refers to the tendency of individuals to prefer information and choices that require less mental effort to process, that are more familiar, and those that individuals had more or previous exposure to. The familiarity of the Five Guys brand reduces the cognitive effort required for consumers to evaluate and choose a restaurant. Familiarity creates a sense of safety and comfort, making it less mentally taxing for consumers to choose a well-known brand over an unknown competitor. The uncertainty surrounding the quality, taste, and overall

experience at Fasttastic Burgers might induce cognitive strain, making it less appealing, even with free delivery or lower prices.

This study contributes to the theoretical understanding in two key areas:

First, the zero-price model appears not to apply to complementary services in the restaurant industry, such as delivery. This finding highlights that consumers prioritize the core aspects of their dining experience (e.g., food quality, taste, and safety) over the perceived benefits of free delivery. This insight could encourage researchers to further explore the boundaries and applicability of the zero-price model across various contexts and industries.

Second, the attraction to free products does not always outweigh the risks associated with consuming them. In the context of the restaurant industry, consumers may be more cautious about selecting a lesser-known food brand, even if it offers free delivery, due to the potential risks related to food quality and safety. This finding suggests that researchers should consider the balance between perceived benefits and risks when examining consumer behavior and preferences, particularly in industries where safety and quality are of paramount importance.

The results of this study have also several practical implications. Firstly, the findings suggest that established and well-known food brands are likely to retain their market dominance, even in the face of promotions offering free or discounted delivery. Therefore, investing in brand recognition and reputation-building efforts could be more effective in attracting and retaining customers than focusing solely on delivery pricing promotions. Second, the study suggests that customers are willing to consider alternative options when the perceived cost of delivery becomes too high. Managers should be aware of this and consider the balance between delivery costs and the value

of their brand recognition. This could involve offering competitive delivery pricing or investing in marketing strategies that highlight the value of their brand to customers.

While this study provides valuable insights into consumer purchasing behavior, there are several limitations to consider. This study encompassed 200 individuals from the United States, a number that might not be sufficient or diverse enough to extrapolate the conclusions to the wider population. The participant pool might not encompass the entire range of customer preferences and behaviors, thus constraining the relevance of the outcomes. Furthermore, the investigation was carried out in the United States, which may not consider distinctions in cultural aspects or fluctuations in consumer behaviors in other countries. Aspects such as brand inclinations, delivery cost, and the significance of promotional activities may vary across geographical locations. In addition, this study employed Amazon Mechanical Turk (MTurk) as the medium for executing the questionnaire. Individuals participating through MTurk might not accurately reflect the broader population, as their motives or backgrounds could diverge from those of the typical consumer. This factor might possibly lead to a prejudiced representation in the gathered information. Finally, selecting Five Guys as the prominent brand for the study may have contributed to a brand recognition prejudice, as certain individuals could possess a pronounced attraction towards the specific brand. This partiality might potentially impact their decisions and restrict the applicability of the conclusions to other renowned brands.

Expanding on the outcomes of the present research, numerous potential directions for upcoming studies can be investigated to further refine our comprehension of customer behavior within the restaurant industry. This investigation concentrated on fast-food restaurants; however, subsequent studies might delve into how the effects of complimentary delivery and other marketing approaches might differ among various restaurant categories, including upscale dining, informal

dining, or establishments featuring international cuisine. Furthermore, future inquiries could assess the consequences of diverse marketing strategies apart from free delivery, such as loyalty programs, referral incentives, and tailored suggestions, to attain a more extensive grasp of their impact on consumer decision-making processes. Additionally, forthcoming research could explore the significance of social factors, like recommendations from acquaintances and relatives or online reviews, in molding customers' preferences and their reactions to complimentary delivery offers. Lastly, future studies may examine the influence of third-party delivery applications and their subscription-driven free delivery promotions on customer preferences and decision-making. Such research could delve into the effects of incorporating these apps with renowned and lesser-known food establishments on consumer conduct, brand allegiance, and the general market trends within the food delivery sector.

Chapter 5: Conclusion

This dissertation has explored various aspects of consumer behavior, decision-making processes, and company performance in the context of the hospitality industry. Through a series of three articles, the research has focused on supplier issues in the restaurant industry, innovation in online travel agencies (OTAs), and consumer preferences in the face of free food delivery promotions. Collectively, the findings from these articles provide valuable insights into the complex dynamics of consumer behavior and highlight the importance of understanding the factors that drive consumers' preferences and choices.

In summary, the research demonstrates that supplier issues, such as food safety, sustainability, ethics, and human rights, play an important role in shaping consumer preferences in the restaurant industry and negatively affect the restaurant. Additionally, the studies emphasize the growing importance of innovation in OTAs, particularly in enhancing user experience and customer engagement. Lastly, the research shows that consumers prioritize established food brands over lesser-known competitors, even when faced with promotional offers or complimentary services, due to a combination of uncertainty, intangibility, and cognitive ease.

More specifically, the first article aimed to investigate the impact of supplier issues on the market value of restaurant firms and assess the significance of different types of supplier issues and their linkages to the restaurants (whether the restaurant's name is directly connected to the supplier issues in the news or not). Employing an event study methodology, the study examined publicly traded restaurant firms in the United States, focusing on announcements related to supplier issues. The results provided support for all three hypotheses: supplier issues negatively affect the market

value of restaurants, direct linkage to a supplier issue has a more substantial impact than an indirect linkage, and different types of supplier issues lead to varying effects on a restaurant's market value.

The second article explored the impact of innovation implementation on online travel agencies (OTAs) market value. As the market becomes increasingly competitive, OTAs must constantly seek ways to enhance user experience and customer engagement to maintain and grow their market share. By employing an event study methodology, this study analyzes the effect of two-sided market specific innovations (same-side and cross-side) on performance and contributes to the literature by expanding the theoretical understanding of innovations. The study found that innovation in general has a positive effect on OTAs market value, with producer-to-consumer (P2C) innovations having a greater impact than producer-to-producer (P2P) and consumer-to-consumer (C2C) innovations.

Lastly, the third article examined consumer preferences in the restaurant industry when faced with free delivery promotions from lesser-known competitors. The study found that consumers prioritize established food brands with proven quality and safety records, even when offered free delivery from lesser-known competitors. This preference can be explained through a combination of uncertainty, intangibility, and cognitive ease. The research indicates that the zero-price model may not be as applicable to the restaurant industry, as consumers value the core aspects of their dining experience (e.g., food quality, taste, and safety) over the perceived benefits of free delivery.

Collectively, these articles emphasize the need for hospitality and tourism businesses to prioritize strategies that positively impact consumer perceptions and behavior, such as effective supplier selection, innovation, and pricing. By providing valuable insights and guidance through the examination of these interconnected factors, this dissertation aims to equip businesses with the

knowledge needed to make informed decisions that promote success, uphold high ethical standards, and ultimately boost customer satisfaction in an increasingly competitive market.

Building on the findings from the dissertation, several interesting ideas for future research can be identified. Future research could investigate the role of innovations including emerging technologies, such as artificial intelligence, blockchain, and virtual reality, in improving supplier management and communication in the hospitality industry, specifically in addressing challenges such as food safety, traceability, and ethical sourcing. Moreover, forthcoming research could investigate the impact of the COVID-19 pandemic on the hospitality industry's supply chain and distribution channels, specifically focusing on long-term changes and adaptations that have emerged in response to the crisis. Future research could also investigate the selection process and criteria used by restaurants when choosing third-party delivery platforms. Lastly, future research could explore the impact of various strategies employed by third-party delivery services on the restaurants they collaborate with. This may include an examination of promotional tactics, such as featuring restaurants as sponsored listings on the apps, offering subscription-based free delivery options with varying levels of price reduction (e.g., from an original delivery price of \$7 to free, or from \$2 to free), and the positioning of restaurants on different pages of the app (e.g., first page vs. second page). By assessing the effectiveness of these strategies, researchers can provide valuable insights for both restaurants and delivery platforms, helping them to enhance their partnerships, customer reach, and overall performance in the competitive food service industry.

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