PRICE BUNDLING IN ONLINE TRAVEL MARKETS: AN EXPLORATORY STUDY

A Thesis Presented

by

JINHOO KIM

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Approved as to style and content by:

_____
David C. Bojanic, Chair

_____
Rodney B. Warnick, Member

_____
Atul Sheel, Member

_____
Rodney B. Warnick, Department Head
Department of Hospitality and Tourism Management

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ABSTRACT

PRICE BUNDLING IN ONLINE TRAVEL MARKETS: AN EXPLORATORY STUDY

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JINHOO KIM, B.A., SEOUL NATIONAL UNIVERSITY

M.S., UNIVERSITY OF MASSACHUSETTS AMHERST

Directed by: Professor David C. Bojanic

Price bundling, offering two or more separate products/services together in a single package at a different price from the sum of the components' prices, is one of the most prevalent marketing practices in many industries, including hospitality and travel. Virtually all types of firms in the hospitality and travel industry, from suppliers such as hotels and airlines to intermediaries such as travel agents, are encouraging customers to purchase travel "packages" rather than a single component of travel.

The purpose of this study is to determine whether the practice of price bundling by online travel agents is associated with actual monetary savings to consumers. Conventional economics theories generally assume that price bundling results in consumer savings in comparison with purchasing the same component products separately, and this is what travel agents are highlighting in their advertisements for selling travel packages. This study also investigated whether the magnitude of bundle discounts vary by four relevant variables such as travel agent, destination city, hotel class, and the timing of purchase.

The results show that purchasing a travel bundle results in significantly lower consumer prices than purchasing the component products separately. However, the magnitude of the bundle savings is inconsistent across the relevant variables. In particular, Travelocity tends to offer significantly greater bundle savings than Expedia; bundles including upper-class hotels appear to provide greater absolute discounts than lower-class-hotel bundles, but those two are not significantly different in terms of percentage discounts. Some important implications of the results are discussed, along with the limitations of the study and suggestions for future research.

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CHAPTER 1

INTRODUCTION

Price bundling, offering two or more separate products/services together in a single package at a different price from the sum of the components' prices, is one of the most prevalent marketing practices in many industries. The following examples show that bundling is implemented in a wide variety of forms, in almost all kinds of markets.

- Many telecommunication and cable companies offer bundling of different products/services usually at a special discount price. For example, Comcast is offering several combinations of its services (i.e., internet access, phone, and cable) as a single bundle.
- Bundling is also common in the restaurant industry. Most restaurants provide "set menus" that bundle several complementary menu items (e.g., appetizer, entrée, dessert, and beverage) at discounted prices. McDonald's various "Value Meals" are good examples of bundling, and although it may seem less straightforward, buffet meal is also one form of bundling.
- In the software industry, Microsoft's MS Office, which contains several different software titles (e.g., Word, Excel, PowerPoint, Access, etc.) in a package, is a typical form of bundling. The company also infamously monopolized the Web-browser market by bundling its less attractive Internet

First, travel by its nature consists of many different components (e.g., flights, hotel stays, car rentals, activities, etc.), and each of the components also has a number of unique attributes that affect its prices. As a consequence, the savings amounts of a travel package, if any, can vary whenever consumers modify its components. Moreover, most travel products are usually distributed through different channels, and the travel industry suppliers are renowned for implementing dynamic pricing strategies. Hence, even if a consumer confirms that booking a package is cheaper than booking the components separately within a travel agent's website, it may not be cheaper compared with the same offerings from other intermediaries or suppliers. Although the Internet has continuously reduced search costs, comparing and evaluating all these alternatives still require a noticeable amount of time and effort of consumers.

In this context, this paper attempts to examine whether booking travel "packages" at online travel agents' websites indeed results in "savings," compared with booking the same components separately either within the same websites or at the component suppliers' websites. In addition, the study is designed to investigate whether the saving effect of bundling varies depending on such variables as destination city, hotel class (i.e., segment), and the timing of booking (i.e., how far in advance a travel product is booked).

The rest of this paper is organized as follows. Chapter 2 reviews the theoretical literature on price bundling and identifies the forms of and rationales for the price bundling strategies currently implemented by online travel agents. Chapter 3 defines the research questions to be examined in this paper, and presents the methods for

collecting and analyzing data. Chapter 4 presents the results and Chapter 5 discusses their implications with some limitations of this paper.

CHAPTER 2

LITERATURE REVIEW

Forms of Price Bundling

Following the classification of Adams and Yellen (1976), price bundling may occur in one of three strategic forms: pure components, pure bundling, and mixed bundling strategies. Pure components strategy, also known as unbundling (Schmalensee, 1984; Stremersch and Tellis, 2002) or separate pricing (Simon and Wuebker, 1999), simply refers to selling products only separately. Pure bundling, sometimes called tie-in sales (Guiltinan, 1987), refers to selling the products only in package form. In this case, the products are available only in the bundled form, and cannot be purchased separately. Mixed bundling refers to a strategy in which a firm offers its products separately as well as a bundle. Guiltinan (1987) further classifies mixed bundling into two forms: mixed-leader bundling and mixed-joint bundling. In mixed-leader bundling, the price for one product in a bundle is discounted only when the other product (i.e., leading product) is purchased at its regular price. The mixed-joint bundling, in contrast, sets a discounted price for the bundle itself, not for an individual product in the bundle.

The top three pure-play online travel agents, without exception, are employing the mixed-joint bundling. On these websites, consumers can choose all available travel products (e.g., flights, hotels, car rentals, activities, etc.) either separately or as a bundle. Moreover, when consumers choose several travel products together as a bundle, the new discounted price is set for the bundle, rather than for each component in the bundle. Such prevalence and homogeneity of the bundling strategies employed by

the online travel agents naturally evoke some questions. What benefits of price bundling make it so popular? Why do the firms use the same form of price bundling: is the mixed-joint bundling superior to the other alternatives, that is, mixed-leader or pure bundling? The next two sections seek to answers these questions.

Rationales Behind Price Bundling

Leverage Theory

The earliest explanation for bundling was developed by the U.S. courts through a long line of cases mostly under the antitrust laws (Whinston, 1990). Often called "leverage theory" (e.g., Carbajo, de Meza, and Seidmann, 1990; Whinston, 1990), this perspective regards pure-bundling as a device for a firm to profitably extend its monopoly power from one market to another. Whinston (1990) articulates this idea as follows: "Tying provides a mechanism whereby a firm with monopoly power in one market can use the leverage provided by its power to foreclose sales in, and thereby monopolize, a second market" (p. 837).

Because leverage theory focuses entirely on the pure bundling of a monopolist, it cannot appropriately explain the online travel agents' motivations for price bundling. First of all, pure bundling is far less common than mixed bundling in the online travel market. In addition, it is apparent that even the leading online travel agent—according to PhoCusWright, Expedia held the largest share with 41.2% of the online travel market, based on the number of bookings for 2004 (Mintel Report: Internet Travel Booking, U.S., September 2005)—does not have sufficient monopoly power over any product it sells. Consumers can usually book most travel products through numerous sellers such as other online agents, brick-and-mortar agents, Internet portals, or the

suppliers. Hence, this paper does not discuss the leverage theory further, and concentrates on several more relevant motivations of online travel agents for price bundling: cost and demand side incentives.

Cost Associated Benefits

Many observers note that bundling can generate cost savings in production, distribution, or transactions (e.g., Adams and Yellen, 1976; Bakos and Brynjolfsson, 1999; Eppen, Hanson, and Martin 1991; Guiltinan, 1987; Jeuland, 1984; Stremersch and Tellis, 2002). The discussions in this regard, though, are often limited and informal, inconsistent in the use of terms, or sometimes not pertinent to the price bundling itself.[1] Nevertheless, most literature seems to base its explanations, explicitly or implicitly, on the concept of "economies of scope." Panzar and Willig (1981) define the term "economies of scope" as a property of production in which "it is less costly to combine two or more product lines in one firm than to produce them separately." They ascribe these cost reductions to the presence of sharable inputs, which once prepared for the production of one output, would be also usable for the production of other products. If the costs of utilizing the sharable inputs for the production of more than one product are subadditive (i.e., less than the total costs of utilizing the same inputs separately for the individual production of the same outputs), firms have strong incentive to realize cost savings by jointly producing or offering the products (Panzar and Willig, 1981). With price bundling, the firms can set appropriate prices for bundles, thereby encouraging consumers to purchase the bundles, which are the cheapest to produce, instead of individual products (Hanson and Martin, 1990).

Although online travel agents, as intermediaries, do not indeed "produce" most products they sell, this cost-associated explanation provides valuable insight to the understanding of their bundling behavior. As Guiltinan (1987) describes, service businesses tend to have a high degree of cost sharing, and the demands for the services offered by a firm are generally interdependent; online travel agents are not exempt from these characteristics. For example, once a consumer decides to book a round-trip flight through an online travel agent, encouraging the consumer to book hotel accommodation as well would be less costly than marketing the same hotel to another potential consumer (i.e., interdependence in demand). In addition, the marginal costs of providing "additional" products to the customer would be generally lower than the marginal costs of providing the "initial" product (e.g., in terms of processing customers' inquiries, requests, or complaints); that is, there exist subadditive costs. Therefore, selling different travel products together as a bundle is an effective way for online travel agents to reduce both marketing and operational costs.

This paper finds another quasi-cost-side rationale which results from the strategic motivation of travel product suppliers. The perishability of their products makes it difficult for service businesses to synchronize supply and demand (Zeithaml, Parasuraman, and Berry, 1985). In the travel industry, for example, hotel rooms and airline seats not sold today cannot be inventoried or saved for future sales. Furthermore, like online travel agents, travel suppliers also have high fixed-to-variable costs ratios. These two features together result in an incentive for the suppliers to sell off the unsold rooms or seats, even at heavily discounted prices. At the same time, they may not want consumers to know about these unusually low prices because such

inconsistent pricing could negatively affect consumer perceptions of the price and quality, and in turn, the value of discounted products. If all these assumptions hold true, it is persuasive to hypothesize that many travel suppliers provide their products to the agents at lower than regular rates, attaching a condition that such discounts are eligible exclusively for the products sold as a bundle with different types of travel products. In fact, several practitioners in the hotel industry have recently mentioned in a conference that they use travel agents' bundling as a "device to sell off distressed inventory while protecting brand value and maintaining an opaque price" (Garrow, Ferguson, Keskinocak, and Swann, 2006). From the agents' perspectives, bundling can in fact "lower" the costs of the products, thereby providing the opportunity to achieve more profits from the same products.

In summary, these cost-associated approaches show that online travel agents can reduce costs through bundling, and thereby achieve greater profits from the same products. Such cost savings through bundling stem in large part from two major sources: (1) economies of scope and (2) travel suppliers' motivation to discount unsold products without undermining consumer perceptions of the price and value of discounted products.

However, cost-side approaches have a couple of problems. First, it is still ambiguous which form of bundling, pure or mixed bundling, is more effective in pricing products or services. After all, the amounts of cost savings from bundling, whether they are due to economies of scope or the strategic motivation of suppliers, do not vary much between these two forms of bundling (Stremersch and Tellis, 2002). Second, while bundling indeed lowers online travel agents' costs, it does not necessarily

lead to the conclusion that the price for a bundle is significantly lower than the sum of prices for the individual products in the bundle. That is, for some reason, online travel agents might not pass on those cost savings entirely to the prices of bundles (e.g., bundling may provide consumers with greater convenience and savings in transaction costs; these benefits may lead to increases in the bundle prices). These issues are addressed in the following sections.

Demand Associated Benefits

A large portion of the economics and marketing literature has focused on the demand-side benefits of bundling, the benefits resulting from consumer heterogeneity in the valuations of the same products. Using rigorous models or stylized examples, this line of research demonstrates that bundling can sort customers into groups with different reservation prices (i.e., the maximum price a buyer is willing to pay for a product) and thereby enable firms to extract greater consumer surplus (i.e., the amount by which the individual's reservation price exceeds the actual price paid) from the same products. The following hypothetical example using travel products illustrates this benefit of bundling clearly.

Suppose that an online travel agent sells air flights and hotel accommodations. Suppose further that there are three consumers and their reservation prices for a round-trip air flight, the same nights of hotel stay, and the bundle (i.e., flight + hotel stay) are revealed as in Table 1.

Table 1: Reservation Price for Air Flight, Hotel, and the Bundle

Consumer	Reservation Prices ($)		
	Flight	Hotel	Bundle
1	1,000	250	1,250
2	800	400	1,200
3	300	700	1,000

- This example is slightly adapted from those in Stigler (1963), Guiltinan (1987), Tellis (1986), and Simon and Wuebker (1999).

If the online travel agent uses an unbundling strategy (i.e., price the two products separately), he will set $800 for the flight and $400 for the hotel, hence receiving $1,600 from the sale of flight and $800 from the sale of hotel. The total received will be $2,400, which is the maximum achievable amount under the given consumer reservation prices, with consumer 1 buying only a flight, consumer 2 buying both, and consumer 3 buying only a hotel stay.

With pure bundling, the agent will set $1,000 for the bundle. All consumers will buy the bundle for $1,000, because the price is either equal to (e.g., for consumer 1), or smaller than (e.g., for consumers 2 and 3) their reservation prices. The agent's total maximum revenue will increase to $3,000, which is 25% higher than the revenue achieved with the unbundling strategy.

If mixed bundling is available, the travel agent will set $800 for the flight, $700 for the hotel, and $1,200 for the bundle (i.e., 20% discount). Under these prices, consumers 1 and 2 both buy the bundle and consumer 3 buys only a hotel stay. The travel agent's total revenue further increases to $3,100, which is even 3.3% greater than the amount achievable with pure bundling strategy.

As stated earlier, these revenue increases come from the more effective extraction of consumer surplus. Table 2 shows how the consumer surplus in this example becomes smaller as the travel agent employs pure bundling and mixed bundling strategies. Consumers can enjoy a total of $500 of consumer surplus with unbundling (i.e., separate pricing). This amount decreases to $450 if the travel agent adopts pure bundling strategy, and decreases even further to $50 with the introduction of mixed bundling strategy.

Table 2: Consumer Surplus Under Unbundling, Pure Bundling, and Mixed Bundling

	Unbundling		Pure Bundling	Mixed Bundling		
Prices ($)	$P_F = 800$ $P_H = 400$		$P_B = 1{,}000$	$P_F = 800$, $P_H = 700$ $P_B = 1{,}200$		
Consumer Surplus from:	Flight	Hotel	Bundle	Flight	Hotel	Bundle
Consumer 1	200	N/A	250	N/A	N/A	50
Consumer 2	0	0	200	N/A	N/A	0
Consumer 3	N/A	300	0	N/A	0	N/A

- Consumer Surplus ($) = Reservation Price – Price
- PF, PH, and PB represent the prices of flight, hotel, and the flight + hotel bundle.
- N/A represents a consumer does not purchase the product since its price exceeds her reservation price. In contrast, 0 (zero) means that a consumer actually purchases the product, but cannot enjoy any positive consumer surplus because the price she pays is equal to her reservation price.

This simple example indicates that bundling has an ability to generate greater revenue than unbundling, and furthermore, mixed bundling may work better than pure bundling in increasing revenues. However, it should be noted that this example holds true only under a number of strict assumptions on consumer reservation prices, market competition, costs, the number of products, etc., hence it is rather difficult to apply this example to more general situations. Indeed, most bundling literature in economics and

marketing after Stigler (1968) can be considered a series of attempts to examine the relative optimality of the three bundling strategies (i.e., unbundling, pure bundling, and mixed bundling) under various assumptions and create more generally applicable principles. Table 3 summarizes important studies in this stream.

Table 3: Bundling Literature Concerning the Demand-side Rationales for Bundling

Study	Contributions and Findings
Stigler (1968)	▪ Widely believed to articulate this idea first using the famous example regarding "block booking" of movies. ▪ Showed how bundling can increase sellers' profits when consumer valuations for two goods are "negatively correlated" (i.e., one consumer values a product higher than another consumer, whereas the former values another product lower than the latter; for example, consumer 1 and 2 in Table 1 have a higher reservation price for flight than consumer 3, whilst they have a lower reservation price for hotel than consumer 3).
Adams and Yellen (1976)	▪ Developed Sigler's idea on a two-dimensional, diagrammatic "reservation price" space, and formally showed that bundling can increase profits if the valuations of the two goods are negatively correlated. ▪ Assuming a multi-product monopolist, two goods, no resale among buyers, and independence in consumer reservation prices (i.e., the value of a bundle to customers is equal to the sum of the individual value of its components, also known as the additivity assumption)[2], compared the optimality of three strategies. ▪ Through numerous experiments covering a wide range of cost structures and customer reservation prices, found "some forms of" bundling to be more profitable than unbundling.
Schmalensee (1984)	▪ Assumed the distribution of reservation prices in the Adams-Yellen framework to be bivariate normal, all the other assumptions being equal, and showed that bundling facilitates more efficient extraction of consumers' surplus by reducing the heterogeneity in their reservation prices. ▪ Showed that pure bundling ca enhance profits even when consumers' reservation prices are positively correlated, as long as they are not perfectly correlated. ▪ Concluded that mixed bundling combines the advantages of pure bundling and unbundled sales, and it generally generates more profits than either: "This policy enables the seller to reduce effective heterogeneity among those buyers with high reservation prices for both goods, while still selling at a high markup to those buyers willing to pay a high price for only one of the goods." (p. S229). (To be continued in the following page)

(Continued from the previous page)

Guiltinan (1987)	▪ Relaxed two strict assumptions of previous economics literature, independence in consumer reservation prices (i.e., the additivity assumption) and monopoly, to consider the complementarity[3] among products and market competition. ▪ Provided four specific conditions under which each possible combination of bundling types (i.e., mixed-joint vs. mixed-leader)[4] and firms' objectives (i.e., cross-selling vs. new customer acquisition) are most likely to be successful.
McAfee et al. (1989)	▪ Investigated the demand conditions under which bundling is more profitable than unbundling in the Adams and Yellen (1976) model. ▪ Demonstrated that mixed bundling dominates pure bundling and unbundling whenever reservation prices for various products are independently distributed among consumers.
Salinger (1995)	▪ Developed a graphical framework to analyze the profitability and welfare implications of pure bundling. ▪ Explicitly considered cost saving effects, as well as demand effects, of bundling. ▪ Affirmed the results of previous economics research (i.e., bundling is generally more profitable than unbundling when reservation prices are negatively correlated). In addition, found that if bundling lowers costs, it tends to be more profitable when demands for the components are highly positively correlated and component costs are high.
Bakos and Brynjolfsson (1999)	▪ Considered the bundling of large numbers of information goods with zero or very low marginal cost. ▪ Found that the profitability of bundling becomes greater when marginal costs of reproducing information goods are low or when customer valuations are negatively correlated.
Stremersch and Tellis (2003)	▪ Synthesizing the results of previous bundling literature, suggested 12 propositions that prescribe the optimal bundling strategy depending on five important factors: (1) consumers' reservation prices; (2) objectives of the firm; (3) competition; (4) costs; and (5) consumer perceptions of bundles. ▪ Suggested that price bundling (either pure or mixed) yields higher revenues than unbundling if conditional reservation prices for two products are negatively correlated across customers (proposition 1). ▪ Proposed that mixed bundling dominates pure bundling only when reservation prices for the "bundle" vary across customers (proposition 2).

Based on these previous studies, this paper concludes that, at least under some conditions, mixed bundling is superior to pure bundling and unbundling in increasing sellers' profits. The most important conditions for successful bundling seem to be either heterogeneity in consumer valuations for the products (either for the component products or the bundle) or cost savings resulting from bundling. To the best knowledge of the author, there has been no formal research examining whether or not these conditions, especially the demand conditions, hold true in the online travel industry. However, the pervasive use of the mixed bundling strategy in the real world leads the author to presume that either demand conditions or cost conditions, or both, hold true. That is, some consumers might value hotel accommodation higher than air flight whilst some others value the flight higher than the accommodation (i.e., negatively correlated reservation prices for individual products). Also, consumers might have quite different reservation prices for the same bundle of travel products. In addition to these demand-side rationales, cost reductions, which are caused by economies of scope and/or travel suppliers' strategic motivation to sell off unsold travel products without harming the brands, leads the online travel agents to employ the mixed bundling strategy extensively.

Optimal Pricing of a Bundle

We can now understand why online travel agents offer travel "packages" as well as individual travel products and under what conditions mixed bundling is more profitable than either pure bundling or unbundling. However, there remains a question regarding the pricing of a bundle. That is, what prices should be set for a bundle and for its component products under mixed bundling?

Most of the previously reviewed studies explicitly or implicitly assume that mixed bundling accompanies discounts. Indeed, as Adams and Yellen (1976) acknowledge, the additivity assumption (i.e., independence in demand), which is very common in traditional economics bundling literature, makes mixed bundling a distinct strategy only if the price for a bundle is lower than the sum of the prices for its component products; otherwise, nobody would buy the bundle. In addition, if bundling indeed brings about considerable cost savings and the market is competitive rather than monopolistic, firms will probably have strong motivation to offer discounts for bundled sales.

However, there are at least two appealing reasons to doubt the idea that bundling is necessarily coupled with considerable discounts: complementarity among bundled products and consumer difficulty in evaluating the savings. First, as Guiltinan (1987) stressed, consumers' reservation prices for a bundle may exceed the sum of the reservation prices for the component products when the two products have a complementary relationship. He identifies three possible sources of this complementary relationship: search economies (i.e., savings in customer time and effort), enhanced customer satisfaction, and improved total image or credibility of the seller. Obviously, many customers will appreciate the convenience of booking several travel products in one place, and hence, may be willing to pay more for this convenience of one-stop shopping. Second, as stated in the introduction, consumers may have difficulty in evaluating the relative savings purchasing a bundle yields. If these conditions hold true, the price for a bundle might not represent a true monetary savings as generally advertised by firms or believed by consumers.

Considering the prevalent use of bundling strategies, prior literature on the optimal bundle "pricing" is surprisingly scant. Using mixed integer linear programming, Hanson and Martin (1987) provide a practical model for a profit-maximizing monopolist to determine optimal bundle prices under a wide variety of cost and reservation price conditions. However, the model does not provide more generally applicable insights into predicting bundle prices of travel products because it requires the exact data on customer reservation prices, through a case-specific questionnaire, as well as the actual cost data of a particular firm.

Venkatesh and Mahajan (1993) develop a probabilistic model for determining optimal prices of a bundle and/or its component products under unbundling, pure bundling, and mixed bundling strategies. They apply the model to pricing ten single music/dance performance tickets and the season ticket, which is in this case the bundle of the ten individual performances over a certain time period. The results are consistent with the traditional view that mixed bundling yields more profits than the others. The results also confirmed that mixed bundling generally occurs with considerable discounts on the bundle: the optimal prices were $14 for the single ticket and $55 for the season ticket. However, this model did not consider complementary relationships among the products. Venkatesh and Kamakura (2003) develop another pricing model that considers the degree of complementarity or substitutability among products. The model suggests that a bundle of complements be priced higher than a bundle of individually valued products under mixed bundling.[5]

The study most similar to this paper is Estelami (1999). Based on the same reasons as stated before (i.e., consumer difficulty in evaluating the savings and

complementarity among bundled products), Estelami hypothesizes that sellers may not offer discounts but charge premiums for complementary bundles. To test this hypothesis, he measured the magnitude of bundle savings for three product categories: fast food meals, photographic equipment, and personal computers. The results show that consumers save about 8%, on average, by purchasing a bundle instead of purchasing its component products separately. However, about 8.8% of all the observed bundles returned higher prices than the sum of the individual prices of the component products. While there are some differences in terms of the frequency, from 4% in fast-food meals to 12% in personal computers, this "bundle surcharge" occurred in all three product categories without exception. Although this empirical study did not measure the prices of travel products, the results cast doubts on the common belief that purchasing travel products as a bundle returns significantly cheaper prices than purchasing the same products separately.

Bundling Literature in the Travel Setting

Given the prevalent use of price bundling in the travel industry, relatively little research has examined the subject in the hospitality and tourism context in particular.

Kinberg and Sudit (1979) developed an algorithm for the determination of appropriate bundle mix and bundle price in the international travel industry, both in the travel agency level (i.e., bundlings of air transportation and land-travel arrangements as well as bundlings of more than one international destinations) and on the resort level (i.e., mix of various recreational amenities and services). The authors premised their algorithm on the assumption that "bundles of air transportation and land arrangements

(e.g., hotel accommodation or rent-a-car) are priced, as a rule, at least in the travel agency level, lower than the sum price of the individual components."

As reviewed earlier, there are two cornerstones for a price bundling strategy to be profitable: (1) the determination of consumer demand (i.e., reservation prices) on bundles and individual products as well, and (2) the identification of the costs of offering various bundles. Stressing this point, Bojanic and Calantone (1990) presented a framework which derives consumer preferences (i.e., reservation prices) for varios individual products and bundles, using the technique of conjoint analysis, and forecasts the changes in sales volume associated with different combinations of individual products/services, using a logit choice model. The profitability of alternative bundling strategies then can be determioned by combining the sales forecast with relevant costs of providing the various bundles and the prices at which the bundles may be offered.

Naylor and Frank (2001) reported that some consumers prefer purchasing bundles of various travel services to purchasing the component products separately because doing so simplifies search and purchase decision processes. In a longitudinal study conducted across first-time and repeat guests at an upscale resort/spa, the authors found that providing an all-inclusive package, even if actual monetary outlay was higher, would significantly increase perceptions of value for first-time consumers in particular.

The studies cited in the preceding paragraphs are not specifically related to the subject of this paper. However, each study has some parts demonstrating that the use of price bundling in the hospitality and travel setting does not contradict, at least in general, the theories and assumptions established in economics and marketing literature. First,

consumer reservation prices for individual travel products and bundles, along with the costs of providing the bundles, determine the optimal bundling strategy (i.e., whether or not to employ price bundling strategy, what bundles to provide, and what prices to set). More important, as assumed in most economics and marketing literature, travel bundles seem to be offered at discounted prices, compared with the sum of the individual prices of component products, while complementarity among bundled products might increase the prices of bundles.

Notes

[1] For example, one stream of the explanations focuses on the relative contribution margin of different products. This view argues that, if a firm's products have high contribution margin ratios (i.e., the prices of the products are relatively higher than the variable costs), price bundling coupled with discounts can be an effective way to increase the profits. Eppen et al. (1991) and Stremersch and Tellis (2002) illustrate this idea using similar examples as follows. Suppose that a company considers offering a bundle of its two products, X and Y. Let product X be sold for $100 and Y for $200, and the company price the bundle of X and Y at $270 (10% discount). In this case, the effectiveness of price bundling depends on the extent product X and Y have contribution margins. If both products have relatively low contribution margins, say, 30% and 40% respectively, 10% discount for the bundle will require more than a 38% increase in demand to make the bundling more profitable than status quo. By contrast, if both products have relatively high contribution margins, say, 70% and 80% respectively, a demand increase of only 15% will offset the profit loss due to the same 10% discount for the bundle. However, what this illustration indeed demonstrates is that discounts on high-margin products are better than discounts on low-margin products in increasing profits. That is, it is still ambiguous why firms bundle their products rather than just discount the prices of individual high-margin products.

[2] This is one of common assumption in the economics literature. Guiltinan (1987) called it the assumption of "strict additivity."

[3] In contrast to the additivity assumption, complementarity means that the reservation price for the bundle exceeds the sum of the reservation prices for the component products because the perceived value of one product is increased if the other is purchased (Guiltinan, 1987).

[4] Implicitly assuming that mixed bundling is at least more profitable than pure bundling, Guiltinan (1987) entirely focused on the either form of mixed bundling: mixed-leader and mixed-joint.

[5] They computed component prices as percentages of the corresponding bundle prices. They also suggest charging higher prices (compared with those for independently valued products) for most substitutes as well as complements. Because a consumer's reservation price for a substitutive bundle is lower than the sum of the reservation prices for the component products, this suggestion is contrary to common belief.

CHAPTER 3

HYPOTHESES, DATA, AND METHODOLOGY

Hypotheses

Bundle Savings Compared with Separate Purchasing within an Agent

The primary objective of this paper is to examine whether purchasing travel bundles yields savings compared with purchasing the component products separately. As reviewed earlier, most bundling literature in economics and marketing suggests that mixed bundling accompany discounts. Although the two factors, complementarity among bundled products and consumer difficulty in assessing the savings amounts, may negatively affect the amounts of consumer savings from bundling, there has been no conclusive evidence that these negative effects are large enough to cause bundle premium or surcharge. Hence, this paper hypothesizes directionally (i.e., one-tailed tests) as follows:

H1 (0): Within the same online travel agent's website, there is no significant difference in the prices of travel products between purchasing them as a bundle and purchasing them separately.

H1 (A): Within the same online travel agent's website, purchasing a bundle yields significantly discounted prices than purchasing the component products separately.

Bundle Savings Compared with Separate Purchasing from Suppliers

Most travel bundles are offered by travel agents, which, as an intermediary, can create a wide variety of bundles by combining different types of travel products. In

contrast, “separate purchasing (i.e., unbundling)” can also occur when consumers purchase more than one travel products directly from the suppliers’ own websites. Therefore, bundle savings at online travel agents’ websites can be measured in comparison to the sum of the prices consumers pay for purchasing the same component products at each supplier’s own website. As in the first hypotheses, there has been no theoretical or empirical evidence that separate purchasing from individual suppliers yields greater savings than purchasing them as a bundle from online travel agents. Therefore, following the prevalent assumption of most bundling literature, this paper predicts that purchasing a travel bundle from online travel agents yields cheaper prices even compared with purchasing the same component products separately from the suppliers.

H2 (0): There is no significant difference in the online prices of travel products between purchasing them as a bundle from online travel agents and separately from the suppliers’ own websites.

H2 (A): Purchasing a travel bundle from online travel agents yields significantly discounted prices than purchasing the component products separately from the sellers’ own websites.

Difference in the Magnitude of Bundle Savings Between Online Travel Agents

This paper also expects that the amounts of bundle savings, measured within an agent, will vary by online travel agents. In other words, the test results of H1 and H2 may not be similar between different online travel agents. Setting prices for indivisual travel products and bundles, and thereby deciding how much monetary discounts to

offer to consumers, is to a great extent a travel agent's strategic decision. In addition, suppliers may provide a travel product to an agent at a cheaper price than to other agents, depending on, for example, the market share or bargaining power of the agents. This paper tests this idea using the following hypothesis. Because there is no sufficient reason to expect one of the two online travel agents will offer significantly greater bundle discounts than the other, two-tailed tests are used.

H3 (0): There is no significant difference in the magnitude of bundle savings between online travel agents.

H3 (A): There is significant difference in the magnitude of bundle savings between online travel agents.

Travel Attributes Affecting the Level of Bundle Savings

The last objective of this paper is to investigate whether bundle savings vary depending on the attributes of products included in a travel bundle. Three relevant attributes are selected as follows: (1) destination city, (2) hotel class (i.e., segment), and (3) the timing of purchase (i.e., how far in advance a bundle is purchased).

H4 (0): There is no significant difference in the bundle savings between two destination cities (i.e., Orlando and San Antonio).

H4 (A): There is significant difference in the bundle savings between two destination cities (i.e., Orlando and San Antonio).

Both cities are large and have major hotel chains. However, Orlando has a higher volume of tourists and more hotels per capita. This might result in a more competitive market and more discounts in Orlando, especially during the lower demand (i.e., non peak) travel periods. However, little has been demonstrated about the differences in the two travel markets. Thus, this paper uses two-tailed hypotheses.

H5 (0): There is no significant difference in the bundle savings between lower-class hotels and upper-class hotels.

H5 (A): There is significant difference in the bundle savings between lower-class hotels and upper-class hotels.

Lower-class hotels and upper-class hotels probably face different demand and cost conditions, thereby behaving differently in the use of price bundling strategy. It is uncertain how the different demand conditions affect the amount of bundle discounts. As to the cost condition, yet, more expensive hotels might have higher profit margins and therefore are likely to provide more latitude for a larger absolute discounts, even though the percentage discounts might not differ. As in Hypothesis 4, yet, two-tailed hypotheses were constructed because little has been known about the relationship between hotel class and the amounts of bundle discounts.

Last, as to the effect of purchase timing, the author expects there might be more potential for savings the earlier you book a travel package (hotel's occupancy would be less, the further ahead). However, yield management procedures would result in price

changes throughout the cycle and we could see movement in both directions based on actual pickup vs. historical pickup.

H6 (0): There is no significant difference in the bundle savings among different timings of purchase (i.e., 1 month, 3 months, and 6 months ahead of departure).

H6 (A): There is significant difference in the bundle savings among different timings of purchase.

Data Sources and Collection Methods

To test the proposed hypotheses, this paper observed the prices of 239 travel bundles, 119 from Expedia and 120 from Travelocity. For each travel bundle, two types of unbundled prices (i.e., one within the same agent, and the other from the suppliers' own websites) were also recorded, then the magnitudes of within-agent savings and versus-supplier savings were calculated.

Three relevant prices for a travel bundle (i.e., bundled price, unbundled price within the same travel agent, unbundled price from suppliers' own online reservation sites) were collected virtually spontaneously to avoid any possible price changes due to systematic price changes based on demand and supply. For the same reason, all prices for a specific timing of purchase were collected approximately within the same week, in the order of one-month, three-months, and six-months advanced booking. In addition, the pace of data collection was matched across the two online travel agents. The data

collection occurred during the first three weeks in July 2007. More details of the data and the collection procedures are presented in the following sections.

Online Travel Agent

The travel bundles in the sample were chosen from two market-leading online travel agents, Expedia and Travelocity. According to Mintel Report (2005), Expedia was the largest (41.2%) and Travelocity was the second largest (19.6%) pure-play online travel agent, based on the number of bookings for 2004. Despite auction-style online travel agents (e.g., Priceline) have been becoming more important in online travel markets, this paper excludes them. Such firms allow consumers to name their own price, and the final price remains opaque until the bid is accepted. Obviously, prices obtained through this process are not directly comparable to those offered by typical online travel agents or suppliers.

Origin

This paper used the same origin, Chicago O'Hare Airport, for the two destination cities. Chicago O'Hare Airport is one of the biggest airports in the nation and is believed to provide comprehensive flight schedules to both Orlando and San Antonio. In addition, the distances from Chicago to both destination cities are almost the same (i.e., approximately 2 hours and 40 minates when using a non-stop flight), therefore not affecting the magnitude of bundle savings by destination.

Duration of a Travel

The duration of a travel was set into 7 nights starting from a Sturday (i.e., Saturday to the next Saturday) for all travel bundles in the sample. For example, if prices were observed on July 7th, the nearest Saturday from August 7th was chosen to

be a departing date for 1-month advanced booking. Hotels and airlines usually set considerably different prices between weekday and weekend reservations, and this practice could affect the amount of bundle discounts. 7 nights starting from a Saturday eliminate the bias due to this pricing practice. Also, it is the most popular length of time for Disney vacations.

Hotel Class

Expedia and Travelocity use slightly different star-rating systems. In order to compare bundle savings by hotel class, it is necessary to apply an identical classification method to the "hotel + flight" bundles selected from different travel agents. Although a number of different hotel classification methods are employed in hospitality literature and in the industry (e.g., O'Connor, 2003; O'Neill, 2003), most of them focus on rating hotel chains, rather than a specific property, and do not provide ratings for independent hotels. For this reason, this paper followed Expedia's ratings, which classifies all properties listed into 9 segments (i.e., 1, 1.5, 2, 2.5, 3, 3.5, 4, 4.5, 5). The class of hotels selected from Travelocity was adjusted according to the classification provided by Expedia. Lower-class hotels in hypothesis 4 were chosen from 2.5 star and 2 star segments, whereas upper-class hotels were mostly chosen from 4 star and higher segments (a few 3.5 star hotels were included in the sample to acquire minimum number of observations).

Selection of Flights

When building a travel bundle, this paper only specified origin and destination airports (i.e., from Chicago to either Orlando or San Antonio), departing and returning dates, and the number of travelers (i.e., one adult). That is, other important

information about flights (e.g., departing and returning times, carriers, class of seats, number of stops, etc.) was not specified. Then, the flights the agents suggest as the first choice for the bundle were accepted as they are without additional modification. This is because pilot data indicated that the travel agents normally suggest from the cheapest available tickets and provide the lowest number of transfers possible at the lowest price. If so, at least as to the research hypotheses of this study, there is no reason to modify the suggested flights intentionally.

However, some complex flights, which include more than one carriers for a single flight, had to be replaced with simpler flights because purchasing the component flights separately from each airline's online reservation site and summing up the individual fares sometimes returned abnormally higher prices than purchasing the same flights separately from the travel agents. When replacing a complex flight, this paper always considered from the second alternatives the travel agents suggested.

Selection of a Travel Bundle and Record of Prices

For every possible combination of destination, departing date and returning date, and hotel class, prices of 10 "flight + hotel" bundles were collected. The bundles were selected from the top of the recommendation lists provided by the agents (i.e., Expedia Picks and Travelocity Picks), based on the assumption that the agents present the most aluable bundles first and consumers normally browse from the top of the first pages.

However, some bundles, whose separate prices could not be collected from the suppliers, were excluded from the sample. For example, several independent hotels did not have their own online reservation site. Sometimes the same types of rooms and rates selected for a bundle at an agent's website were not available at suppliers'

own reservation websites, hence making it unreasonable to compare the bundle price with the unbindled price.

All other identifiable attributes of a travel bundle (e.g., room type, carriers, seat class, departure and arrival times, restrictions on tickets, etc.) were perfectly matched across the relevant purchases from agents and suppliers. Also, special attention has been given to prices to make sure that the prices are all-inclusive of associated taxes and fees.

Data Structure

Table 4 shows the structure of data and the number of observations in each condition. As indicated in the table, the grand total number of observations becomes 717 (one travel bundle purchased at Expedia for San Antonio, upper-class hotels, and 6-month advanced booking was excluded because the unbundled price from the suppliers were abnormally higher than the bundled price and unbundled price from Expedia).

Table 4: Data Structure and the Number of Observations

Agent	Bundling	Destination	Hotel Segment	Timing of Purchase		
				1 Month	3 Months	6 Months
Expedia	Bundling	Orlando	Lower	10	10	10
			Upper	10	10	10
		San Antonio	Lower	10	10	10
			Upper	10	10	9
	Unbundling (Agent)	Orlando	Lower	10	10	10
			Upper	10	10	10
		San Antonio	Lower	10	10	10
			Upper	10	10	9
	Unbundling (Suppliers)	Orlando	Lower	10	10	10
			Upper	10	10	10
		San Antonio	Lower	10	10	10
			Upper	10	10	9
Travelocity	Bundling	Orlando	Lower	10	10	10
			Upper	10	10	10
		San Antonio	Lower	10	10	10
			Upper	10	10	10
	Unbundling (Agent)	Orlando	Lower	10	10	10
			Upper	10	10	10
		San Antonio	Lower	10	10	10
			Upper	10	10	10
	Unbundling (Suppliers)	Orlando	Lower	10	10	10
			Upper	10	10	10
		San Antonio	Lower	10	10	10
			Upper	10	10	10
				240	240	237

CHAPTER 4

RESULTS

Bundle Savings Compared with Separate Purchasing within an Agency

For all travel bundles collected in the sample (119 from Expedia and 120 from Travelocity), both agents quoted discounted prices compared with the prices of separate purchasing within the same agent.

Independent samples t tests were conducted to determine whether purchasing two travel products as a bundle at an online travel agent results in significant discounts compared with purchasing the same products separately from the same agent. Table 5 and 6 show that the results were different by agent. Travelocity returned significantly lower prices for all tested combinations of hotel class and timing of purchase. Expedia, by contrast, did not necessarily return significant bundle discounts; the amount of discounts was significant only for the two conditions out of six tested.

Table 5: Bundle Savings Within An Agent (Expedia)

Description		Mean Price (USD)	Std. Deviation	*t*	*p*-Value (1-tailed)
Lower-class hotel & 1-month advanced purchase	Bundled	712.69	134.71	-1.973	.028*
	Unbundled	823.45	211.87		
Upper-class hotel & 1-month advanced purchase	Bundled	1,453.90	381.31	-1.405	.084
	Unbundled	1,638.35	446.20		
Lower-class hotel & 3-month advanced purchase	Bundled	706.78	163.47	-1.519	.069
	Unbundled	802.99	231.41		
Upper-class hotel & 3-month advanced purchase	Bundled	1,979.56	355.96	-2.442	.010*
	Unbundled	2,265.42	383.91		
Lower-class hotel & 6-month advanced purchase	Bundled	857.30	230.29	-.766	.224
	Unbundled	920.21	285.92		
Upper-class hotel & 6-month advanced purchase	Bundled	2,167.87	668.08	-.691	.247
	Unbundled	2,317.50	666.73		

Table 6: Bundle Savings Within An Agent (Travelocity)

Description		Mean Price (USD)	Std. Deviation	*t*	*p*-Value (1-tailed)
Lower-class hotel & 1-month advanced purchase	Bundled	707.71	134.52	-2.454	.009*
	Unbundled	844.61	210.16		
Upper-class hotel & 1-month advanced purchase	Bundled	1,451.14	405.30	-2.207	.017*
	Unbundled	1,766.48	494.09		
Lower-class hotel & 3-month advanced purchase	Bundled	673.73	158.02	-2.396	.011*
	Unbundled	823.50	230.63		
Upper-class hotel & 3-month advanced purchase	Bundled	1,786.21	423.50	-3.925	.000*
	Unbundled	2,298.29	401.34		
Lower-class hotel & 6-month advanced purchase	Bundled	763.34	211.00	-2.072	.023*
	Unbundled	914.12	247.70		
Upper-class hotel & 6-month advanced purchase	Bundled	2,009.53	711.25	-1.762	.043*
	Unbundled	2,443.43	844.43		

Bundle Savings Compared with Separate Purchasing from Suppliers

The results showed that the prices of purchasing a travel bundle from a travel agent are not necessarily lower than the prices of purchasing the component products individually from each supplier. Thirty-seven bundles out of 119 (31.1%) at Expedia did not beat the supplier prices, while 17 bundles out of 120 (14.2%) at Travelocity returned prices higher than the supplier prices.

Independent samples t tests were used to determine whether there is significant difference in the prices of travel products between purchasing them as a bundle from an online travel agent and purchasing them separately from suppliers. The results were similar in H1. As shown in Table 7 and 8, Travelocity returned significant bundle discounts for 3-month advanced purchase, both for lower-class and upper-class hotels, whereas Expedia failed to return significant bundle discounts for all combinations of hotel class and timing of purchase.

Table 7. Bundle Savings Versus Suppliers (Expedia)

Description		Mean Price (USD)	Std. Deviation	*t*	*p*-Value (1-tailed)
Lower-class hotel & 1-month advanced purchase	Bundled	712.68	134.71	-.871	.195
	Unbundled	758.12	190.44		
Upper-class hotel & 1-month advanced purchase	Bundled	1,453.90	381.31	-1.503	.071
	Unbundled	1,652.75	452.24		
Lower-class hotel & 3-month advanced purchase	Bundled	706.78	163.47	-1.232	.113
	Unbundled	782.97	223.19		
Upper-class hotel & 3-month advanced purchase	Bundled	1,979.56	355.96	-1.549	.065
	Unbundled	2,165.33	401.05		
Lower-class hotel & 6-month advanced purchase	Bundled	857.30	230.29	-.255	.400
	Unbundled	877.91	279.27		
Upper-class hotel & 6-month advanced purchase	Bundled	2,167.87	668.08	-.367	.358
	Unbundled	2,245.02	628.85		

* Unbundled price here means the sum of the prices of purchasing the component products individually from each supplier's own website.

Table 8: Bundle Savings Versus Suppliers (Travelocity)

Description		Mean Price (USD)	Std. Deviation	*t*	*p*-Value (1-tailed)
Lower-class hotel & 1-month advanced purchase	Bundled	707.71	134.52	-1.581	.061
	Unbundled	778.08	146.76		
Upper-class hotel & 1-month advanced purchase	Bundled	1,451.14	405.30	-1.413	.083
	Unbundled	1,650.02	481.47		
Lower-class hotel & 3-month advanced purchase	Bundled	673.73	158.02	-1.955	.029*
	Unbundled	792.79	221.82		
Upper-class hotel & 3-month advanced purchase	Bundled	1,786.21	423.50	-3.041	.002*
	Unbundled	2,200.15	437.24		
Lower-class hotel & 6-month advanced purchase	Bundled	763.34	211.00	-1.527	.068
	Unbundled	871.61	236.73		
Upper-class hotel & 6-month advanced purchase	Bundled	2,009.53	711.25	-1.294	.102
	Unbundled	2,271.30	559.24		

Difference in the Magnitude of Bundle Savings Between Online Travel Agents

To compare the average bundle savings offered by Expedia and Travelocity (i.e., the savings measured in comparison with a separate purchase within the same agent), independent samples t tests were conducted. As expected from the results of the

first two hypotheses tests, these tests demonstrated that there were significant differences in the bundle savings offered by the two online travel agents, at least under some conditions.

Table 9 and 10 show that Travelocity tends to offer significantly greater bundle discounts than Expedia, both measured in absolute and percentage terms. In particular, it seems that the further in advance a travel bundle is purchased, the greater is the amount of the difference between the two agents. In other words, there was no significant difference in the magnitude of bundle discounts provided for one-month advanced purchases whether it is measured in absolute or percentage terms.

Table 9: Absolute Bundle Savings* by Agent

Description		Mean Savings (USD)	Std. Deviation	*t*	*p*-Value (2-tailed)
Lower-class hotel & 1-month advanced purchase	Expedia	110.76	114.97	-.757	.454
	Travelocity	136.90	103.19		
Upper-class hotel & 1-month advanced purchase	Expedia	184.44	163.36	-1.959	.057
	Travelocity	315.34	250.17		
Lower-class hotel & 3-month advanced purchase	Expedia	96.21	95.11	-1.610	.116
	Travelocity	149.77	114.40		
Upper-class hotel & 3-month advanced purchase	Expedia	285.86	335.14	-1.939	.060
	Travelocity	512.08	400.00		
Lower-class hotel & 6-month advanced purchase	Expedia	62.92	78.09	-2.942	.006*
	Travelocity	150.79	108.36		
Upper-class hotel & 6-month advanced purchase	Expedia	149.63	150.82	-3.778	.001*
	Travelocity	440.33	301.34		

* Bundle savings here and in Table 10 means the savings in comparison with purchasing the component products individually from the same agent.

Table 10: Percentage Bundle Savings* by Agent

Description		Mean Savings (%)	Std. Deviation	*t*	*p*-Value (2-tailed)
Lower-class hotel & 1-month advanced purchase	Expedia	12.19	8.65	-1.072	.290
	Travelocity	15.02	8.04		
Upper-class hotel & 1-month advanced purchase	Expedia	10.64	9.18	-1.818	.077
	Travelocity	16.69	11.73		
Lower-class hotel & 3-month advanced purchase	Expedia	10.87	7.81	-2.495	.017*
	Travelocity	17.26	8.39		
Upper-class hotel & 3-month advanced purchase	Expedia	11.75	12.45	-2.270	.029*
	Travelocity	21.65	15.01		
Lower-class hotel & 6-month advanced purchase	Expedia	5.75	5.70	-3.794	.001*
	Travelocity	15.91	10.53		
Upper-class hotel & 6-month advanced purchase	Expedia	6.51	6.44	-4.199	.000*
	Travelocity	17.84	9.95		

* Bundle savings here means the savings in comparison with purchasing the component products individually from the same agent.

Bundle Savings by Destination

The effect of destination on bundle savings was tested using independent samples t tests. As seen in Table 11 and 12, the two destinations differed significantly, at least under some conditions, in yielding bundle savings. Orlando produced significantly greater bundle savings for one-month and three-month advanced purchases, while San Antonio produced greater bundle savings for six-month advanced purchse. Although not throughly incorporated into the hypothesis, the seasonality of the destination cities seems to result in these differences. Orlando hotels may have relatively strong demand in winter, therefore they do not provide as much bundle discounts as in the other seasons.

In addition, it is noticeable that these significant differences were observed only in the lower-class hotel sectors. As shown in the tables, the bundle savings provided by upper-class hotels were not different between the two destination cities.

Table 11: Absolute Bundle Savings by Destination

Description		Mean Savings (USD)	Std. Deviation	*t*	*p*-Value (2-tailed)
Lower-class hotel & 1-month advanced purchase	Orlando	159.47	138.16	2.171	.036*
	San Antonio	88.19	49.63		
Upper-class hotel & 1-month advanced purchase	Orlando	227.30	234.51	-.648	.521
	San Antonio	272.49	205.47		
Lower-class hotel & 3-month advanced purchase	Orlando	160.05	137.50	2.301	.027*
	San Antonio	85.93	42.96		
Upper-class hotel & 3-month advanced purchase	Orlando	392.95	470.40	-.098	.922
	San Antonio	404.99	279.09		
Lower-class hotel & 6-month advanced purchase	Orlando	74.21	81.99	-2.082	.044*
	San Antonio	139.49	113.74		
Upper-class hotel & 6-month advanced purchase	Orlando	284.38	318.22	-.325	.747
	San Antonio	313.79	238.72		

Table 12: Percentage Bundle Savings by Destination

Description		Mean Savings (%)	Std. Deviation	*t*	*p*-Value (2-tailed)
Lower-class hotel & 1-month advanced purchase	Orlando	16.26	9.75	2.092	.043*
	San Antonio	10.95	5.80		
Upper-class hotel & 1-month advanced purchase	Orlando	13.53	12.60	-.077	.939
	San Antonio	13.80	9.07		
Lower-class hotel & 3-month advanced purchase	Orlando	16.65	10.17	1.961	.057
	San Antonio	11.48	5.94		
Upper-class hotel & 3-month advanced purchase	Orlando	17.14	18.06	.192	.849
	San Antonio	16.25	10.26		
Lower-class hotel & 6-month advanced purchase	Orlando	7.55	6.90	-2.217	.033*
	San Antonio	14.11	11.29		
Upper-class hotel & 6-month advanced purchase	Orlando	10.42	10.10	-1.212	.233
	San Antonio	14.32	9.98		

Bundle Savings by Hotel Segment

The effect of hotel segment on bundle discounts was tested using independent samples t tests. As expected in the hypotheses, the results differed depending on whether the discount was measured in absolute amount or percentage amount (See Table 13 and 14). When measured in absolute amount, bundles including an upper-class hotel provide significantly greater discounts than bundles including a lower-class hotel. In terms of percentage savings, however, there was no significant difference in the magnitude of bundle savings between the two classes.

Table 13: Absolute Bundle Savings by Hotel Class

Description	Mean Savings (USD)		Std. Deviation	*t*	*p*-Value (2-tailed)
One-month advanced purchase	Lower-class	123.83	108.64	3.263	.002*
	Upper-class	249.89	218.83		
Three-month advanced purchase	Lower-class	122.99	107.33	4.401	.000*
	Upper-class	398.97	381.82		
Six-month advanced purchase	Lower-class	106.85	103.30	4.073	.000*
	Upper-class	298.71	279.01		

Table 14: Percentage Bundle Savings by Hotel Class

Description	Mean Savings (%)		Std. Deviation	*t*	*p*-Value (2-tailed)
One-month advanced purchase	Lower-class	13.61	10.84	.026	.979
	Upper-class	13.66	8.36		
Three-month advanced purchase	Lower-class	14.07	8.63	.986	.327
	Upper-class	16.70	14.51		
Six-month advanced purchase	Lower-class	10.83	9.82	.663	.509
	Upper-class	12.32	10.10		

Bundle Savings by Timing of Purchase

An one-way ANOVA was used to assess the impact of three timings of purchase on the magnitude of absolute and percentage bundle savings. As presented in Table 15 and 16, the results failed to support the hypothesis that bundle savings vary significantly in relation to how far in advance a travel is booked.

Although the relationship between the timing of purchase and bundle savings was not significant, it would be an invalid argument to say that there are no differences in bundle savings among different timings of purchase. This is because some factors other than the timing of purchase may have affected the results, in different directions and magnitudes, thereby making it impossible to observe solely the effect of the timing on bundle savings. If the timing of purchase has been effectively decoupled from other potential determinants of bundle savings, the results might have suggested significant differences.

Table 15: Absolute Bundle Savings by Timing of Purchase

Description	Mean Savings (USD)	Std. Deviation	*F*	*p*-Value
Lower-class hotel & 1-month advanced purchase	123.83	108.64		
Lower-class hotel & 3-month advanced purchase	122.99	107.33	.323	.724
Lower-class hotel & 6-month advanced purchase	106.85	103.30		
Upper-class hotel & 1-month advanced purchase	249.89	218.83		
Upper-class hotel & 3-month advanced purchase	398.97	381.82	2.548	.083
Upper-class hotel & 6-month advanced purchase	298.71	279.01		

Table 16: Percentage Bundle Savings by Timing of Purchase

Description	Mean Savings (%)	Std. Deviation	*F*	*p*-Value
Lower-class hotel & 1-month advanced purchase	13.61	8.36		
Lower-class hotel & 3-month advanced purchase	14.07	8.63	1.525	.222
Lower-class hotel & 6-month advanced purchase	10.83	9.82		
Upper-class hotel & 1-month advanced purchase	13.66	10.84		
Upper-class hotel & 3-month advanced purchase	16.70	14.51	1.387	.254
Upper-class hotel & 6-month advanced purchase	12.32	10.10		

CHAPTER 5

DISCUSSION

Overall, the results of this exploratory study support the hypothesis that mixed price bundling in the online travel market is normally presented with actual monetary savings on bundle purchases. This paper also investigated whether the magnitude of bundle discounts vary by four relevant variables such as travel agent, destination city, hotel class, and the timing of purchase. The results demonstrate that at least the first three variables have significant relationships with the magnitude of bundle discounts provided to customers.

These findings has several important implications for price bundling implemented in online travel markets. First, although a couple of factors (i.e., the complementary relationship between bundled products and consumer difficulty in assessing the actual amount of bundle discounts) may increase the consumer value of purchasing a travel bundle, these effects seem not substantial enough to result in actual bundle "premiums." As a result, consumers can achieve actual monetary savings, although the amount may vary case by case, by purchasing a travel bundle instead of purchasing the component products individually from the same agent or the suppliers' own websites.

Next, the results suggest significant differences in the use of price bundling between the two online travel agents, Expedia and Travelocity. In general, Travelocity seems to implement price bundling more extensively than Expedia, providing greater consumer savings for wider array of travel bundles. It would be worth investigating in future research what factors result in this difference. Based on the prior bundling

literature (e.g., Guiltinan, 1987), one might hypothesize that Expedia is superior to Travelocity in creating and presenting the complementary relationships between bundled products, thereby being capable of selling even the same travel bundles with relatively moderate discounts than its competitors. Alternatively, one might conjecture that the differences of travel agents in terms of market presence or market share empower (or urge) a travel agent to employ price bundling in different ways.

As to the effects of travel attributes on the magnitude of bundle savings, the results suggest that the amounts of bundle savings are likely to vary by destination and hotel class. In particular, the results indicate that travel bundles including upper-class hotels tend to provide significantly greater "absolute" savings than bundles including lower-class hotels. Given that the percentage savings do not differ significantly by hotel class, the author conjecture that hotel firms and/or travel agents are simply applying similar discount rates to all types of their bundles. If this is the case, the firms, especially online travel agents, need to conduct research on consumer demand (i.e., reservation prices for individual products and bundles). Based on the information about the distribution of consumer reservation prices for their individual products and bundles, the firms could enhance the profitability of bundling strategy by applying different discount rates to each segment.

As an exploratory study, this paper has several limitations that future research could address. First, the independent variables in this study has very limited number of values. In other words, the price data (i.e., dependent variables) ware collected from only two online travel agents, for two destinations, for two hotel classes, and for three timings of purchase. As a result, generalizing the results into the entire online travel

industry may not be valid. For example, the results failed to find significant differences in bundle savings among three different timings of purchase. However, if one tests the same hypotheses for different time frames of purchasing (e.g., last minute or two weeks ahead of departure), the results might indicate significant differences. Therefore, a natural extension of this study will be one that examines similar hypotheses for more various combinations of relevant independent variables, using sufficient numner of observations for each condition.

One additional limitation of this study is that some other important variables, which probably have significant influences on bundle savings offered at a specific time for a specific destination, were not incorporated into or controlled by the tests. For instance, seasonality of a destination may affect the bundle savings by timing of purchase as well as by destination city. Because seasonality is generally destination-specific and often difficult to quantify, controlling or including the seasonal effects explicitly in the test should be challenging but worthwhile.

This paper documented theoretical rationales that can explain the prevalent use of price bundling in the online travel industry. In addition, it has been examined whether travel bundles are presented to consumers with actual monetary savings as commonly believed or advertised, and whether the magnitude of the savings varys by some relevant attributes of travel. Lastly, this paper has presented several important implications and limitations of the findings, along with suggestions for future research. The author hopes this study stimulates more advanced research and helps travel firms make better decisions in offering and pricing their travel bundles.

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