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# A behavioral economics approach to hospitality and tourism research

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# A behavioral economics approach to hospitality and tourism research

## Highlights

- Four issues in hospitality and tourism demand research are critically discussed.
- The behavioral economics demand framework is introduced to hospitality and tourism research to fill the research gap.
- A novel conceptual model is proposed to initiate new effort in hospitality and tourism demand modeling at the disaggregate level.


## Abstract

**Purpose**—Our goal is to critically evaluate hospitality and tourism demand research and introduce a behavioral economics approach to solve the problems faced by researchers.

**Design/methodology/approach**— Current issues in hospitality and tourism demand analysis are identified through critical reflection, and a behavioral economics approach is adopted to develop a new conceptual framework.

**Findings**—Four issues in hospitality and tourism studies are identified from the microeconomic theory and econometric modeling perspectives. Our demand framework provides both a theoretical underpinning and quantitative models to resolve the identified issues. With a focus on consumers' cost-benefit assessments in light of individual differences and environmental factors, our conceptual framework represents a new effort to quantify hospitality and tourism demand at the disaggregate level with interactive multiple demand curve estimations.

**Research limitations/implications**—Our analytical framework for hospitality and tourism demand analysis is unique, and it fills the research gap. However, our research is still in the conceptual stage, and we leave it to future studies to empirically test the framework.




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**Practical implications**—The proposed demand framework at the disaggregate level will benefit both private and public sectors involved in hospitality and tourism businesses in terms of pricing, marketing, and policymaking.

**Originality**—We offer a new conceptual model that bridges the gap between aggregate and disaggregate hospitality and tourism demand analyses. Specifically, we identify research directions for future hospitality and tourism demand research involving individual tourists/consumers at the disaggregate level.

**Keywords** Behavioral economics, Demand modeling, Demand curve, Hospitality, Tourism

**Paper type** Conceptual paper

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## 1. Introduction

With the remarkable improvement in living standards over the years, the consumption of hospitality and tourism products/services has become an increasingly important component in consumers' expenditure budgets, improving their well-being and generating positive externalities. As a labor-intensive industry, hospitality and tourism encompasses copious economic activities across various business sectors in which the demand for hospitality and tourism products/services plays a critical role in determining corporate profitability and informing government taxation and welfare policies. Therefore, analyzing the determinants of hospitality and tourism demand and accurately estimating that demand present considerable challenges to academics and practitioners alike.

Recent hospitality and tourism demand studies are rooted in neoclassical demand theory, which analyzes the effects of demand determinants on magnitude and direction. Estimated demand functions are then used to forecast future demand. With the introduction of advanced econometric methods, hospitality and tourism demand analysis now emphasizes modeling techniques that use aggregated secondary data related to international and regional hotel guests/tourists (Song *et al*., 2009). Despite the success of these modeling techniques at the aggregate level, they make a series of strict assumptions about consumers, and for that reason, they neglect a considerable amount of information relating to individual differences and environmental factors.

Unlike neoclassical economics, which sacrifices descriptive power at the individual level for theoretical generality and predictability, behavioral economics (BE) is based on the theory of bounded rationality, stressing the inconsistency of behavioral patterns and decisions across individual consumers and contexts (Simon, 1956, 1982). Although hospitality and tourism researchers are increasingly aware of behavioral heterogeneity at the micro level, applications of BE to hospitality and tourism research are limited to *ad hoc* estimates of demand functions at the individual consumer level, which are difficult to generalize. Furthermore, the behavioral heterogeneity derived from analyzing individual demand behavior has yet to be properly integrated into a



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systematic econometric modeling process to enable demand analysis to be conducted within an acceptable framework.

We believe that future hospitality and tourism demand research will urgently need to find a balance between the above-referenced schools of thought. In that regard, in this reflection paper, we critically evaluate hospitality and tourism demand studies and introduce a BE-based research framework as a viable solution to researchers' problems. This framework also suggests possible future research directions in hospitality and tourism demand analysis.

## 2. Current issues in hospitality and tourism demand analysis

Standing at the critical point between neoclassical economics and BE, we recognize that the reason for the most significant issues restraining the further advancement of hospitality and tourism demand analysis is that microeconomic demand theory is the theoretical foundation of econometric estimates of demand. Four significant issues are discussed in the following sections.

### *2.1 Theoretical foundation*

As the theoretical foundation of hospitality and tourism demand analysis, microeconomic demand theory explains an individual's decision-making process toward a final consumption decision based on the assumption that the consumer is a utility maximizer who pursues the optimal choice subject to personal preference and budget constraints. This argument leads to two major problems, which naturally have been inherited by the derived studies on demand.

**Problem 1.** *The assumption of a rational consumer is too restrictive*. The postulation of consumer choice optimization originates from rational choice theory, which assumes that individual consumers are perfectly rational in their cost-benefit analyses for decision-making. More specifically, individuals are expected to be consistently rational regardless of context and to have adequate information and ability to seek utility maximization (Gilboa, 2010). However, this ideal is far from reality even when consumer behavior is examined at the macro level. The notion of perfect rationality has



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been disputed in the general field of economics ever since the proposition of bounded rationality, which contends that people are "satisficers" rather than utility maximizers (Simon, 1982). Empirical studies in broader research areas have also proven that consumers' decisions are context-dependent and susceptible to multifarious environmental factors, such as risk (Kahneman and Tversky, 1979), framing (Tversky and Kahneman, 1981), and choice architecture (Thaler and Sunstein, 2008). There have been similar findings in hospitality and tourism studies, which have discovered that tourists' or hotel/restaurant guests' preferences and decisions are altered by crowding (Hou *et al.*, 2021), information framing (Denizci Guillet *et al.*, 2022), travel hazards especially COVID-19 (Li *et al.*, 2021), and word of mouth (Song *et al.*, 2022). These results imply that the demand for hospitality and tourism products/services is sensitized to specific consumption contexts. However, this behavioral deviation from perfect rationality, especially in terms of the contextual dependence of demand, has attracted less attention from researchers whose work in hospitality and tourism demand studies is based on microeconomic demand theory.

**Problem 2.** *Individual differences are theoretically emphasized but practically ignored*. Although the theory of consumer choice asserts that an individual's consumption decision is subject to personal preferences and budget constraints, theory-implied individual differences have not been well captured in existing demand modeling processes because of the research concentration on market demand estimation and data unavailability at the individual level (Song *et al*., 2009). Moreover, because the theory of consumer choice provides a theoretical underpinning to individual demand instead of market demand, microeconomic theory rationalizes market demand as the direct summation of individual demand by devising a "representative consumer" who stands for the statistical average of the market (Thomas, 1985). In other words, the modeling of market demand considers all individuals identically as representative consumers, and individual demands are therefore averaged out to arrival at market demand. This treatment is undoubtedly insufficient to integrate the heterogeneity of preferences caused by individual differences in sociodemographics (Bogicevic *et al.*, 2018),



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personalities (Poon and Huang, 2017), and past experiences (Masiero and Qiu, 2018). Individuals with disparate personal preferences, even if sharing the same budget, make different purchase decisions, which consequently lead to different demand curves. Thus, modeling the demand of a "representative consumer" flattens the variations in demand patterns across all kinds of consumers.

In summary, the strict assumptions in theory and the stress on market demand in practice tacitly acknowledge the high homogeneity of individuals' consumption behaviors while disregarding behavioral heterogeneity in light of individual differences and environmental factors. These two problems are also embedded in applications of econometric demand models in hospitality and tourism research.

*2.2 Econometric demand modeling*

Two further problems have been recognized with respect to the econometric demand models used in hospitality and tourism demand analysis. We explain these problems based on the demand curve, which illustrates the relationship between the price of a hospitality and tourism product and the quantity demanded.

**Problem 3**. *The dynamics of elasticity along the demand curve are not parameterized.* The linear demand curves on logarithmic coordinates, commonly seen in hospitality and tourism demand modeling studies, require an exactly constant price elasticity of demand (PED) over the price range, and we categorize the models fitting these demand curves as "constant-elasticity demand models" (in double-log functional form). However, they are rarely observed in the real economy given that consumers are not perfectly rational in their consumption decisions. A more realistic assumption would be that PED varies with price. In this case, the demand model is referred to as a "dynamic-elasticity demand model" (in linear/semi-log functional form). However, researchers have rarely focused on parameterizing elasticity dynamics along the demand curve but instead have become habituated to specifying elasticity as a constant measure of the demand response to price change. One of the reasons that constant-elasticity demand models are preferred to their dynamic-elasticity counterparts is



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because it is easy to estimate the model and interpret the parameters (Song *et al*., 2009). Furthermore, for reasons of statistical convenience, even when dynamic-elasticity demand models are applied, elasticity is commonly estimated as an average constant indicator. In effect, researchers have paid the most attention to the dynamics of elasticity over time (time-varying elasticity) instead of price or other cost variables. One important exception in this respect is the use of time-varying parameter models in tourism demand analysis to relax the constancy of elasticity over the sample period (Song *et al*., 2011). Peng *et al*. (2015) found that income elasticity tends to increase over time, and Smeral and Song (2015) as well as Smeral (2019) concluded that income elasticity fluctuates across business cycles, whereas PED tends to remain unaffected. This shows that PED is special in that it can reveal a habitual pattern of consumer behavior that is relatively stable over time. Therefore, it is inappropriate in demand analysis to specify only the dynamics of price elasticity over time without probing its evolution along the demand curve, especially when attempting to understand consumers' decision-making in the cost-benefit analysis.

**Problem 4.** *Current demand modeling exercises do not map out complete demand curves.* The estimated econometric demand models have largely relied on historical data from secondary sources. Survey data are occasionally used particularly for modeling household or organization demand, but the surveys are generally implemented with non-experimental designs (Song *et al.*, 2009). Both methods of data collection do not necessarily reflect substantial price fluctuations, preventing researchers from fully examining consumers' responses to a wide range of price changes. This restricts our understanding of the complete shape of a demand curve, especially the variation of demand over the full price range – from a free product/service, which attracts a maximum level of demand, to a price that is high enough to stop consumers from purchasing. As a result, a linkage among price, demand, and business revenue (or consumer expenditure) cannot be established, hindering practitioners from considering important implications that can help them formulate optimal pricing strategies (e.g., price adjustment) or public policies (e.g., taxes and



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rebates) to manipulate demand. Therefore, the demand curve over the full price range must be constructed to exhibit its complete shape and reveal consumers' dynamic cost-benefit judgments. This means that secondary data are insufficient to explore consumer demand from a behavioral perspective.

These critical microeconomic demand theory issues in hospitality and tourism demand studies must be resolved, and therefore a novel conceptual framework must be developed. This framework should both relax the strict and unrealistic assumptions about economic agents and refocus the quantitative analysis of demand from the aggregate level to the disaggregate level. More specifically, the framework requires a proper demand model with one additional parameter that specifies the dynamics of elasticity over the full price range for the sake of modeling thoroughness and interpretability. Furthermore, this framework requires a new data-collection method to ensure that individual demand data in a variety of decision-making contexts are attainable. In the next section, we introduce the BE approach and argue that it offers a unified conceptual and quantitative framework to help resolve these problems.

## 3. BE theory

### *3.1 Two branches of BE*

Taking bounded rationality as its core, BE holds that people are 1) not consistently rational; 2) restricted by their own biases; 3) subject to external conditions; and 4) sometimes altruistic and fairness oriented. Simon (1956) likened bounded rationality to a pair of scissors, with one blade representing human cognitive limits and the other blade representing environmental structures, underscoring the influential power of both the internal consciousness and external contextual factors to shape decision-making. Correspondingly, two branches of BE are derived from the two sides of bounded rationality (see Table I).

**<Table I here>**

Arising out of the introduction of cognitive psychology to microeconomics, "cognitive BE" concerns "psychological economics" and for that reason, it is also known as the



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"behavior of economics." As cognitive psychology pays special attention to the mental process, BE from this perspective uses the deductive approach to determine how cognitive biases cause people to diverge from rational decisions. Two of the most prominent theories emerging from this perspective are prospect theory (Kahneman and Tversky, 1979) and nudge theory (Thaler and Sunstein, 2008). Nonetheless, some have charged that cognitive BE has insufficient generalizability to establish solid economic theories or axioms. This may be primarily attributed to its significant emphasis on point estimates of individual behavior, whose deviation from the general theory is normally discrete, contingent, and unsystematic, making it difficult to theorize.

"Behavioral BE" introduces microeconomics into operant psychology (also known as "radical behaviorism," a subdiscipline of behavioral psychology). Referred to as the "economics of behavior," this branch concerns "economic psychology." Behavioral BE seeks to explore robust functional relationships between environmental factors and behavior through the inductive approach. Its advantage is its ability to find that ostensibly "irrational" behavior is instead orderly and systematic and fits well within a unified framework called the "behavioral-economic demand framework," which contributes to the theorization and quantification of BE.

Cognitive BE exclusively dominates the empirical applications of hospitality and tourism demand studies. Many important principles of this branch of BE have been adapted to explore the decision-making of tourists, marketers, and residents, including anchoring, the endowment effect, and the framing effect (Lucas and Nemati, 2020; Tanford *et al*., 2019). In contrast to the popularity of cognitive BE, the application of behavioral BE in various research domains remains in its infancy. No attempt has been made to apply it in hospitality and tourism research. Nevertheless, we believe that behavioral BE creates a sound theoretical basis for resolving current issues and redirecting hospitality and tourism demand analysis. First, behavioral BE essentially attaches importance to human behavior and decision-making in view of individual differences and environmental factors. Second, demand modeling requires the establishment of a continuous functional relationship between demand and its



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determinants. As cognitive BE conducts point estimation, it is relatively less useful for demand modeling and the construction of a comprehensive quantitative framework. Fortunately, this can be achieved by the behavioral-economic demand framework under behavioral BE.

### *3.2 BE demand framework*

#### *3.2.1 Origin*

Before merging with microeconomics, operant psychology concentrated on the environmental factors that act as stimuli and serve as the instant cause and chronic shaper of behavior. A stimulus performs as either a reinforcer whose presence increases the likelihood of a certain behavior or a punisher whose presence decreases the likelihood of that behavior. The emergence of the BE demand framework is motivated by behaviorists' endeavors to measure reinforcer value, that is, a reinforcer's efficacy in influencing behavior. Its measurement metric evolved through several phases, until recent research introduced microeconomic demand theory and indexed reinforcer value to demand (Hursh and Silberberg, 2008).

The most crucial analogy between microeconomics and operant psychology is that economic goods can be viewed as reinforcers. Consumers should behave as supposed (i.e., they should pay the required costs) to obtain the goods, and the presence of the goods performs as a stimulus to evoke and sustain this consumption behavior. As a corollary, the meanings of price and demand are extended in the operant paradigm. Any effort required and any risk of loss (e.g., money, time, and energy) to obtain the reinforcer is a type of price, and the acquisition of any valued thing that acts as a reinforcer (e.g., physical commodity, experience, and relationship) reflects demand (Hursh and Roma, 2013).

#### *3.2.2 Demand curve, elasticity, and essential value*

The BE demand framework is based on a demand curve that delineates cost-benefit interactions across individuals and contexts. Two fundamental parameters are used to map a complete demand curve. To dictate the starting point of the demand curve,



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demand intensity (also called "baseline consumption") $Q_0$ is set to equal the demand level when the price is zero; the slope (i.e., PED) dictates the rate of decay. Apart from these, the breakpoint *BP* represents the price at which an individual ceases consumption. Through laboratory experiments, behavioral economists conclude that the demand curve on logarithmic coordinates is normally downward sloping with an accelerating speed of decrease, as exemplified in Figure 1. Put another way, a typical BE demand curve displays a progressively increasing PED with price, which implies an inverted U-shaped total revenue curve (called the "total output curve" in the operant paradigm). The price at which the output reaches the peak ($O_{max}$) is denoted as $P_{max}$, which is the optimal pricing point at which PED equals unity in absolute terms.

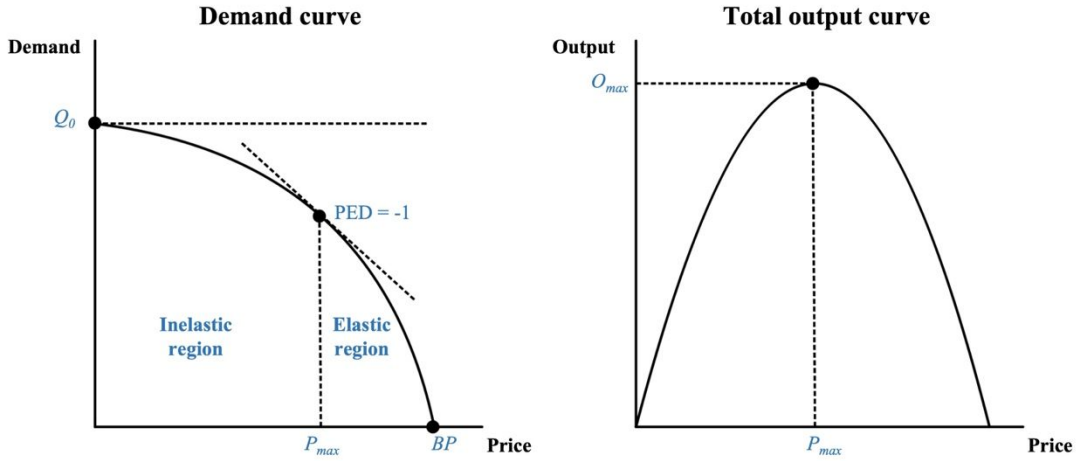


**Figure 1.** Typical behavioral-economic demand curve and total output curve.

Within this framework, elasticity is imbued with new attributes and meanings. Behavioral economists review PED as a continuum, indicating that the PED of any good, regardless of its nature, eventually becomes elastic (inelastic) provided that the price increases (decreases) sufficiently. This contradicts the microeconomic argument that PED is an inherent property of goods; instead, the entire dynamic of PED is the property of the goods. PED distinguishes goods by manifesting their efficacies in reinforcing consumption behavior, a concept termed "essential value" (EV). The more resistant to change the demand is with a price increase, the higher the value of the goods as a reinforcer in strengthening/maintaining consumption behavior, which indicates a higher EV; and vice versa.

*3.2.3 BE demand models*

The evolution of BE demand models involves the pursuit of finding a single parameter to properly specify the rate of change in PED and frame an increasingly negative slope for the demand curve on logarithmic coordinates. All of the models are capable of processing both individual and aggregate demand data. Three key models are introduced below.

**Model 1. Exponential demand model**

The exponential demand model (EXPL) proposed by Hursh and Silberberg (2008) presents a functional form with a single parameter to determine the change rate of elasticity with an exponential decay demand function of price:

$$logQ = logQ_0 + k\left(e^{-\alpha Q_0 P} - 1\right), \#(1)$$

where $k$ is the span parameter specifying the log range of the observed demand considering there is no lower bound on the log scale, and $\alpha$ is the parameter to be estimated, which stipulates the rate of decrease of the demand curve. A lower (higher) $\alpha$ indicates that the increasing rate of PED over the full price range is relatively slow (fast), meaning that consumer demand for the commodity is more (less) resistant to changes in price. In this case, the EV of the commodity for this consumer is high (low). Thus, there is an inverse relationship between EV and $\alpha$, but $\alpha$ is not a direct index of EV, as the dynamic of elasticity is jointly determined by $\alpha$ and $k$. Therefore, it is preferable to quantify EV using Equation 2 (Hursh, 2014) to obviate the effect of $k$ and make EV comparable across studies involving different span values.

$$EV = \frac{1}{100\alpha k^{1.5}} \#(2)$$

**Model 2. Exponentiated demand model**

The EXPL has one general complication when it is fitted to the data on the log scale: the zero value is undefined. However, zero consumption values are exceptionally common in the application of BE demand models given that the full price range is accounted for, making the treatment of zero values quite influential in parameter



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estimation. To resolve this complication, Koffarnus *et al*. (2015) offered the exponentiated demand model (EXPD), which is simply the exponentiated form of the EXPL in which the data are fitted on the natural scale (see Equation 3).

$$Q = Q_0 10^{k(e^{-\alpha Q_0 P} - 1)} \#(3)$$

As the EXPL and the EXPD are essentially identical, their parameters are comparable on the same scale. The most notable advantage of the EXPD is that original data can be directly accounted for without replacing zero values of consumption, and thus they do not disturb the demand curve fitting.

**Model 3. Zero-bounded demand model**

The log scale is not only undefined at zero but also unbounded from below, which is why the EXPL includes parameter $k$ to specify the span of $logQ$. However, the assignment of a $k$ value is challenging because the span of individual demand data may vary so dramatically that it is difficult to apply a single $k$ to represent all of the individual data series equally well. In addition, the existence of $k$ prevents $\alpha$ from being a direct standardized index of EV. The EXPD, as a variant of the EXPL, inherits this problem. Accordingly, the zero-bounded demand model (ZBE) was recently proposed by Gilroy *et al*. (2021) to settle those issues by replacing the log transformation with the inverse hyperbolic sine (IHS) transformation into the EXPL. This transformation can simulate logarithmic properties and accommodate zero/negative values. The $\log_{10}$-like transformation is calculated as follows:

$$IHS(x) = log\left(0.5x + \sqrt{0.25x^2 + 1}\right). \#(4)$$

As $IHS(x)$ has a lower bound of zero, the span of demand data on the IHS scale simply equals $IHS(Q_0)$. The ZBE is established by plugging the transformed demand into the EXPL according to Equation 4 and normalizing the $\alpha$ parameter to the span, written as follows:

$$IHS(Q) = IHS(Q_0) e^{-\frac{\alpha}{IHS(Q_0)} Q_0 P}. \#(5)$$



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The ZBE successfully resolves the complications of undefined zero value and lower bound on the log scale while maintaining the original functional form and parameter interpretations. Furthermore, it no longer needs an additional span parameter and is therefore simplified. The model is superior in terms of accommodating zero values on model fitting, but there is always a deviation, as the IHS scale cannot completely emulate the log scale. In this respect, the ZBE is expected to be more adequate and robust when zero values are a serious concern; otherwise, the EXPL and the EXPD might be better choices. Given the recognition of both advantages and limitations for all three models, one should not conclude that any model consistently outperforms the others, and it is always imperative to conduct an empirical analysis to evaluate and select the model that performs better in describing a particular data set.

*3.2.4 Hypothetical purchase task*

As secondary demand data usually contain deficient price points for depicting a complete demand curve and provide fewer details about each individual consumer, behavioral economists have increasingly used hypothetical purchase task (HPT) questionnaires to collect participants' intentional demand data. Research on hospitality and tourism demand is in a similar situation: the lack of demand modeling at the disaggregate level is rooted in data unavailability. Therefore, we introduce HPT as a novel method of data collection.

HPT implies an experimental design. It asks participants to indicate their demand at various predetermined prices in a hypothetical consumption scenario. Accordingly, treatment is exerted on participants through the description of a consumption scenario at the beginning of the HPT questionnaire, and the controlled variable is typically the demographics across treatment groups. Although it measures stated rather than actual consumption behavior, HPT has irreplaceable advantages and is probably the best alternative when secondary data are deficient. Moreover, effective techniques have been incorporated into the data-cleaning process to handle nonsystematic HPT data and control hypothetical biases (Stein *et al*., 2015).



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The generalizability of HPT to various generic goods was corroborated by the seminal writing of Roma *et al*. (2016), which is regarded as instructional in applying HPT in a wide range of disciplines. They tested the manipulations of two design factors – price density (i.e., the number of price levels at which participants are required to declare their demand) and purchase type (i.e., quantity demanded vs. purchase likelihood) – on the estimation performance of the EXPL for six goods differing in kind and price (i.e., hamburger/sandwich, toilet paper, pay-per-view movie/show/event, fine-dining restaurant meal, refrigerator, and vacation package) and gave recommendations for the future use of HPT by researchers in various fields. In brief, a density of no less than nine prices is suggested, and both purchase types are verified as effective measures of demand.

*3.2.5 Significance*

The BE demand framework offers microeconomists a new lens through which to examine and apply demand theory. This pioneering framework of interpreting and parameterizing the dynamics of elasticity over the full price range produces a value metric that concentrates more closely on individual behavioral practices and their variations across each other. This is accomplished by stressing the cost-benefit interaction revealed from an individual's series of decisions. Furthermore, the definitions of price and demand are broadened, allowing for analyses of varying types of behavior (other than physical consumption) against physical costs, provided that the variables are quantifiable. This is particularly rewarding for hospitality and tourism demand studies that explore complex decision-making processes. In addition, the successful construction of individual demand curves opens the door to more systematic explorations of both the subjective and the objective factors that alter the demand curves for different groups, markets, and populations.

## 4. New conceptual model

We introduce the BE demand framework to a greater audience in the hospitality and tourism research community to initiate a new effort in quantifying hospitality and



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tourism demand at the disaggregate level, with a focus on understanding more about consumers' cost-benefit assessments in light of both individual differences and environmental factors. Consolidating these considerations, we propose a new conceptual model for researchers who are interested in analyzing and forecasting the demand for hospitality and tourism products/services (see Figure 2). The core relationship that this framework attempts to uncover is the response of consumer demand to diverse costs involved in consumers' decision-making process. Thanks to the flexibility of the BE demand models in terms of estimation, group demand curves can be estimated and compared after integrating individual differences or environmental factors, revealing consumers' behavioral heterogeneity in demand at the disaggregate level.

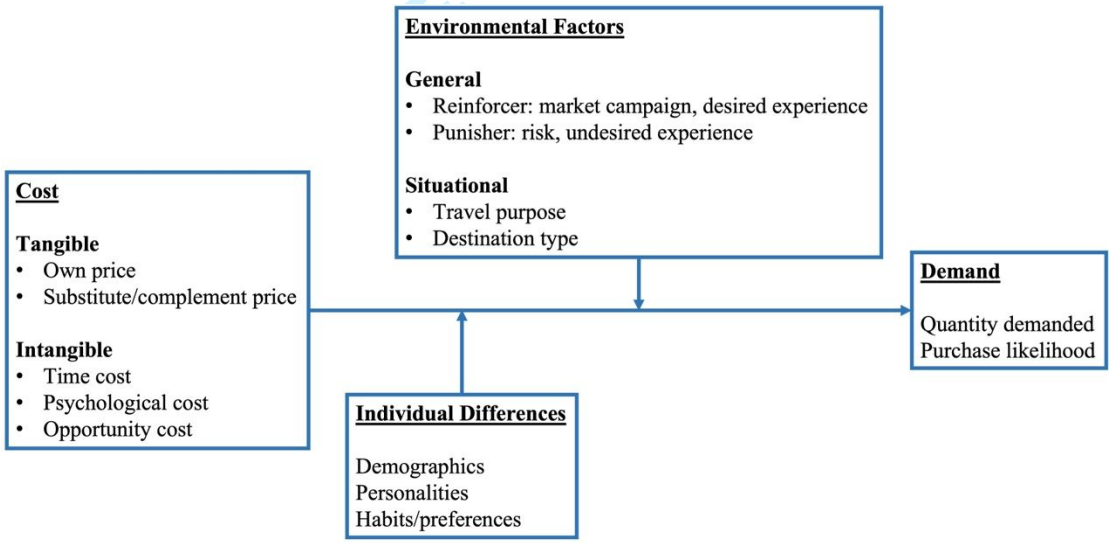


**Figure 2.** A new conceptual model for hospitality and tourism demand studies.

*4.1 Dependent variable*

Consumer demand can be measured in terms of either quantity demanded or purchase likelihood, depending on the nature of the goods. In normal cases, demand curve delineates the relationship between price and quantity demanded, and the quantity demanded implies multiple purchase decisions. However, this measurement is not suitable for slow-moving consumer goods (SMCG; as opposed to fast-moving consumer goods, or FMCG) as defined by the marketing literature, referring to big-

ticket goods that are infrequently purchased, especially in quantity. In this context, the probability of a single purchase is more appropriate as a measure of demand. It is believed that most hospitality and tourism products, such as hotel rooms and travel packages, are mostly SMCG for individuals. However, transportation and food and beverage products may be distinct and belong to the category of FMCG in light of the high frequency at which they are consumed. Both measures are sufficiently informative to exhibit consumption behavior and estimate the demand models (Roma *et al*., 2016). Nonetheless, it is important to be aware that they deviate from each other regarding the examined decision-making process, because quantity demanded comprises several repeated purchases, whereas purchase likelihood refers to a single purchase. As a result, the meaning of $O_{max}$ with purchase likelihood as the demand is not the maximum total revenue/expenditure, but the expected average revenue/expenditure per capita.

*4.2 Independent variables*

To investigate the micro level of demand at which individual consumption behavior is primarily subject to the cost-benefit analysis, various consequential costs associated with the consumption are taken as independent variables to determine the demand. Based on the generalized notion of price within the BE demand framework, any relevant quantifiable costs can and should be incorporated into the demand models. We summarize them into tangible and intangible costs. Tangible costs typically refer to the monetary costs or prices of goods. Similar to microeconomic demand analysis, influential prices include not only the product's own price but the prices of related goods (i.e., substitutes and complements). Intangible costs are nonmonetary but potentially quantifiable, and they account for a pronounced part of the total perceived costs for consumers when they are making consumption decisions about hospitality and tourism products. Important intangible costs are time cost (considering the importance of property location and transportation efficiency), psychological cost (considering various risks), and opportunity cost (considering the fundamental tradeoff between leisure and work). Incorporating them into demand modeling moves us one step closer to consumers' real decision-making process.



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*4.3 Grouping variables*

The heterogeneity of consumer demand altered by subjective individual differences and objective environmental factors is assessed by making comparisons across the demand curves of the groups at issue, especially their model parameters and EVs. Group demand curves can be estimated by averaging or pooling individual demand data. Accordingly, individual differences and environmental factors act as grouping variables, which can be collected as a part of the HPT questionnaires.

Individual differences are mainly related to consumers' characteristics that may diversify their behavior, including demographics (e.g., age, gender, and income), personalities, and habits/preferences. Demographics are relatively straightforward to acquire, whereas personalities and habits/preferences may require specific types of measurement techniques. Notably, income, as one essential factor of demographics, is now treated as a grouping variable rather than as an independent variable by convention. The reasons are as follows: 1) at the micro level, income characterizes consumers and 2) differences in income affect not only a consumer's demand at a single price point but the entire demand curve. Systematic examinations of the effects of individual differences will remedy the deficiency of quantitative justifications in microeconomic demand theory.

Environmental factors are classified into general and situational factors. Concordant with the stance of behavioral BE, general environmental factors are either reinforcers to strengthen/maintain demand (e.g., market campaign and desired experience) or punishers to weaken/demotivate demand (e.g., risk and undesired experience). In contrast, situational environmental factors impact demand subject to their contexts. These factors are normally decisive, industry-specific characteristics in hospitality and tourism activities, such as travel purpose and destination type. Incorporating environmental factors into the demand analysis will enhance our understanding of tourists and how their decision-making mechanisms interact with their surroundings when purchasing hospitality and tourism products.



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## 5. Conclusions and implications

### *5.1 Conclusions*

We present and discuss four critical issues in hospitality and tourism demand studies that primarily relate to aspects of the theoretical foundation that presume rational and homogeneous consumers and econometric models that estimate constant price elasticity on an incomplete demand curve. Therefore, the BE approach is proposed as a viable solution that acknowledges the effects of individual differences and environmental factors on demand. Its demand framework provides an innovative viewpoint of consumers' cost-benefit assessment of hospitality and tourism products/services, stressing the complete demand curve across individuals and contexts. Behavioral-economic demand models have advantageous functional forms that specify elasticity dynamics using a single parameter, balancing thoroughness and interpretability. As a valid data-collection method, HPT ensures sufficient individual preferences for the manipulation of various consumption scenarios. Accordingly, a new conceptual model that better facilitates a systematic hospitality and tourism modeling process at the disaggregate level is proposed.

### *5.2 Theoretical implications*

As a critical reflection, this study draws researchers' attention to the problems associated with the conventional hospitality and tourism demand analyses. Behavioral BE and an associated demand framework for hospitality and tourism research are proposed for the first time as a viable solution to fill in the identified research gaps. This proposal also encourages researchers to apply the novel research framework to more demand studies not only in hospitality and tourism but also in general consumer behavioral research. Methodologically, we offer a new approach that bridges the gap between aggregate and disaggregate individual demand analysis by deriving group demand curves of consumer segments. The overall analytical framework will have both descriptive and predictive powers, and the heterogeneity of hospitality and tourism consumers' behavioral patterns attributable to individual differences and specific environmental factors can be systematically explored.



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*5.3 Practical implications*

Successful demand analysis at the disaggregate level will benefit both private and public sectors involved in the hospitality and tourism businesses. For private sectors, first, the complete demand curve with elasticity dynamics establishes the linkage among price, quantity demanded, and revenue with respect to specific hospitality and tourism products/services, implying the optimal pricing point of the product/service and possible shifts in demand and revenue given certain price adjustments. Second, the investigation of the subjective and objective factors' influence on demand can equip hospitality and tourism firms with deeper insights into their target customers and therefore develop more effective business strategies, including differentiated marketing, service failure recovery, and crisis management. Third, modeling the prices of related goods/services can effectively quantify the potential substitution and complementary effects to frame the market competition within one (or across several) sector(s), or in further detail, to uncover the possibly dissimilar competition situations for different consumer segments.

The above implications also apply to public policy formulations following the same rationale. Decisions about taxes/rebates to nudge public behavior or facilitate industry development can be supported by the outcomes of the corresponding price adjustments on both individual and group demand curves. Moreover, future investigations into the relationship between demand and consumers' intangible costs, such as the cost of time, will be particularly informative for decision-making on infrastructure investment. In addition, exploring the effects of environmental factors on the shifts of demand curves can help evaluate the efficiency of relevant policies (e.g., destination promotion).

*5.4 Limitations and future research*

It is worth noting that by assuming the exogeneity condition, the proposed conceptual model focuses on the unidirectional causation of tangible and/or intangible costs on hospitality and tourism demand and rules out the possible effect of demand on the costs, which is allowed by some other demand modeling techniques (Assaf *et al.*, 2019). This



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might be one limitation attached to the conceptual model. Another limitation is that as a conceptual study, this study focuses on theoretical and methodological improvements only without presenting any empirical evidence. Future empirical studies based on the research framework presented here would be beneficial for both academics and practitioners.

The above discussion indicates that hospitality and tourism researchers can benefit from analyzing demand at the disaggregate level. Specifically, they can use behavioral-economic models with a view to dissecting the evolution of consumers' cost-benefit analysis on hospitality and tourism products/services in their decision-making processes based on individual differences and environmental factors. An in-depth analysis of EVs represents a step further. Individual EVs can be extracted from individual demand curves and segmented by consumer profiles to portray the types of consumers who value a specific hospitality and tourism product/service at different levels. Furthermore, as an already comprehensive and inclusive parameter to describe demand and its dynamics, EV itself can be modeled with respect to quantifiable consumer characteristics, such as age and income, among individuals to establish linear or nonlinear functional relationships and thus to explore deeper structures of consumer demand. Accordingly, future studies should make good use of EV to measure consumers' valuation of hospitality and tourism products/services and their demand resilience to various costs.

Another important research direction is to fit the behavioral-economic demand models using multiple cost variables. The demand models introduced above are univariate models, with own price being the only explanatory variable for demand. Although a cross-price demand model was proposed in Hursh and Roma (2013), that model remains univariate and does not accommodate own price as a determinant. Nevertheless, there is no doubt that consumer decision-making is shaped by different costs simultaneously. Therefore, more advanced multivariate behavioral-economic demand models are needed to comprehensively analyze hospitality and tourism demand at the disaggregate level.



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The BE modeling approach may also pave the way for more accurate hospitality and tourism demand forecasting, because researchers can adopt dynamic econometric models with both cross-sectional and time series data to study behavioral variations in hospitality and tourism product/service consumption with greater depth and precision. In addition, for aggregate demand forecasting, a good understanding of the disaggregate data extracted from individual consumers/tourists will be beneficial to aggregate hospitality and tourism demand forecasting accuracy improvement. More specifically, a targeted HPT survey with certain scenarios can first be conducted to model individual demand behaviors and obtain the associated EVs. The estimated relationships between EVs and individual differences or environmental factors may then be used for large-scale Bayesian econometric analysis of aggregate hospitality and tourism demand using secondary data. In addition, these identified disaggregate relationships can help researchers either segment the data into groups and forecast their future demand separately or adjust their forecasts under different economic conditions.

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**Table I.** Two branches of BE.

| | Cognitive BE | Behavioral BE |
|---|---|---|
| **Origin** | Cognitive psychology into microeconomics | Microeconomics into operant psychology |
| **Essence** | Behavior of economics | Economics of behavior |
| **Preoccupation** | Cognitive biases in decision making | Environmental influences on behavior |
| **Theoretical Framework** | Point estimates | Functional relationships |
| **Logic of Inquiry** | Deductive | Inductive |

*Note.* Adapted from Magoon and Hursh (2011).

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