The Effects of Non-Participatory Characteristics: The Case of Lift-Tickets

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During the winter season of 2004 and 2005, approximately 113 million people visited ski resorts within the United States. These sport enthusiasts travel from North Carolina to Alaska, visiting a wide variety of winter resorts. A full spectrum of vacation experiences is available to the consumers of these resorts, such as spartan crags or leisure hot spots (i.e. Aspen). Considering the success of these types of resorts, with different focuses, it could be assumed that consumers value different characteristics of a winter resort. Furthermore, in many cases, the price of a lift-ticket is even more expensive at the posh resorts even with a mediocre sloped mountain. This begs the question, why would somebody pay a premium price for average slopes? Could there possibly be factors beyond the mountain that affect the prices of lift-tickets?

The winter resort[2] market provides an interesting case of implicit pricing (that is, there are no exact characteristics which equate the price of a lift-ticket). In order to even utilize a given resort's facility, a consumer must first purchase a lift-ticket. While the possession of this "ticket" provides no immediate gain to a consumer, it implicitly represents the value of their skiing or snowboarding experience. Historically, research of the winter resort market has valuated lift-ticket prices in regard to consumers' on-mountain experience via skiing or snowboarding. However, with the increasing popularity of inclusive winter resorts, a multitude of activities beyond the typical are possible, such as snowmobiling, snowshoeing and cross country skiing. Supporting these activities is the expansion of on-site lodging, dining, entertainment, and other leisure facilities to accommodate and fulfill consumers' wants. Therefore, winter resorts are able to supply more customers with their on-mountain "experience" with the expanded facilities and other activities.

The aim of this paper is to examine the effect of these "non-participatory characteristics" on the price of lift-tickets at winter resorts. For this research, the term "non-participatory characteristic" includes any product, service, or facility available to consumers at a winter resort which is not obtained with the purchase of a lift-ticket. For example, alternative activities such as snow-shoeing and amenities like spas are considered non-participatory characteristics.

This research differs from previous work by testing for the effects of non-participatory characteristics on the price of lift-tickets at winter resorts. By using a hedonic pricing model, the utility of a lift-ticket to a consumer is directly estimated from visible characteristics of a resort. Therefore, this paper suggests that a customer of winter resorts not only values the characteristics of the mountain, but the other leisure activities and amenities available at a winter resort as well. The results estimated from this methodology will then be applied to other previously determined similar and applicable markets.

I. Literature Review

Past literature relating to this research has come from two disciplines, previous winter resort market research and hedonic pricing literature. Thus, this research is original in the fact that it blends two respected facets of economic research to explain market forces of winter resort lift-ticket pricing.

The seminal work of the winter resort industry is considered Barro and Romer (1987). In this research, the authors argue that consumers of ski areas purchase a lift-tickets based on a future utility rendered. In Barro and Romer (1987), utility is determined by the number of runs possible for an individual. Furthermore, they examine other factors of lift-ticket prices such as area quality, transportation costs, and customer preference. In conclusion, Barro and Romer (1987) finds that a difference in quality (e.g. such as vertical drop and lift capacity) and customer preference (e.g. avidness of skiers) affect the prices of lift tickets.

Barro and Romer (1987) also apply the implicit pricing principles of lift-tickets to other markets such as toll roads and amusement parks. They hypothesize that the faster a toll road is to motorists or more rides available to visitors of an amusement park, the more expensive the price will be to the consumer to access the resort's facilities. These applications assume that a winter resort is a club. This assumption is further defended in Cowen and Glazer (1991). .

Pioneered by Buchanan (1965) and Knight (1924), "club theory" describes the economic situation of when consumers must pay to gain access to a facility. Furthermore, this is complicated by the fact that this facility is shared among all consumers willing to pay the entrance fee. Along with toll-roads and amusement parks, winter resorts can be characterized under these types of firms because of the sale of tickets to gain access to a congestible facility.

Another important paper on the lift-ticket market is Morey (1984) which examines customer behavior in choosing a resort to visit. In this study, the utility gained by the purchase of a lift-ticket by a consumer is based upon the amount and types of terrain available at a given winter resort. Therefore, the only affecting factors of lift-ticket prices are assumed to only be participatory characteristics, those characteristics that better estimate the on-mountain experience of consumers. The central deficiency of this research comes from the data itself, which consisted of the results of a random sampling of 163 post-secondary students' market purchasing behavior from Colorado. Not only does this represent an extremely minute proportion[3] of ski area customers, but minimal fraction of contributed industry revenue as well.[4]

The most relevant, and recent, research on this market is Mulligan and Llinares (2003). This research uses ordinary least squares regression to identify determinants of lift-ticket prices at downhill skiing areas, particularly the effects of the implementation of detachable chair-lifts. The authors find that the adoption of detachable chair-lifts is positively correlated with increases of lift-ticket prices. Also, resort location, vertical drop, area population, and competition are also found to affect prices. Once again, utility is determined as the number of runs possible for a consumer. The authors hypothesize and show that the adoption of detachable chair lifts by winter resorts can increase lift-ticket prices due to less time spent on lifts by consumers, increasing the number of runs possible per consumer. However, as in previous work, non-participatory characteristics are absent from the hypothesis and empirical analysis.

II. Theory

The basis of all theory of hedonic pricing models stem from Lancaster's (1966) consumer theory. In this seminal work, the author establishes that consumers purchase goods based upon perceived utility. That is, consumers will value utility of a given service or good based upon visible characteristics. Stemming from this idea of product characteristics determining utility is hedonic (or implicit) pricing models. In Rosen (1974), utility is described as a function of product characteristics. These particular characteristics are what differentiate a product among substitutes, and ultimately affecting the competitive pricing. The hedonic model is the method used to measure the effects of non-participatory characteristics. As will be shown, the utility derived by consumers of winter resorts is not limited to the number of runs possible per consumer, but a general experience of using a winter resort's facilities.

The market of winter resorts provides an interesting case when determining contributory variables of lift-ticket pricing. The market analysis is particularly unusual when considering the normal market structure of service providers. As stated in Marburger (1997), the customer of winter resorts is simply not buying a lift-ticket; they are buying access to the given mountain. This imposes considerable difficulty when identifying supply and demand determinants for winter resort lift-ticket pricing.

A. Demand

As in any market, determining demand (Q_n^d) for lift-tickets at winter resort *n* is based upon the perceived utility of customers (U_n) with the constraint being price (P_n). This is shown in equation 1.

$$(1) \qquad Q_n^d = f[\overset{+}{U}_n, \overset{-}{P}_n].$$

This is the function for demand used by Barro and Romer (1987) and Mulligan and Llinares (2003). Furthermore, this is also the same specification for Q_n^d in hedonic pricing. However, the difference in this paper with prior research is the assumption of what determines utility. While prior market research recognizes utility as the number of runs possible, hedonic Pricing theory suggests that utility is derived from other, more visible characteristics of a winter resort.

While Barro and Romer (1987) assumed U_n is based on the number of runs possible, Mulligan and Llinares (2003) has expanded this definition—including other characteristics of winter resorts such as vertical drop, lift capacity, technology adoption, and competition. However, absent from all of these prior studies are resort characteristics beyond the skiing or snowboarding experience.

Therefore, this study recognizes U_n as a function of the participatory characteristics (X_n) and non-participatory characteristics (A_n), of a winter resort. Assuming such, the general function for U_n used in this research can be seen as the Cobb-Douglas production function, shown in equation 2 below.

$$(2) \qquad U_n = X_n^{\upsilon} A_n^{\tau};$$

X_n = on-site, participatory characteristics of winter resort n;

A_n = on-site, non-participatory characteristics of winter resort n;

τ = marginal utility of A_n;

υ = marginal utility of X_n.

Additionally, it is assumed that;

$\tau + \upsilon = 1$ and $0 \le \tau \le 1$.

The rationale behind this specification of utility is based on the theory of Oi (1977). The author examines the effects of a two-tariff pricing structure as a legal form of monopoly in the case of Disneyland. In particular, he claims that amusement parks can alter the price of their entrance tickets in response to the souvenir, dining, and other leisure activities within the park. Therefore, Disneyland's entrance ticket price is not only a reflection of the rides and attractions, but all characteristics of the park (including dining facilities, souvenir shops, etc.). With amusement parks being an example of a club, these principles can be applied to the winter resort market, specifically with the presence of non-participatory characteristics. The price of a lift-ticket at a winter resort is not only an indicator of the quality of the mountain, but supporting facilities as well. Thus, Oi (1977) would suggest that the non-participatory characteristics of a winter resort affect the level of utility of winter resorts for consumers.

Using equations 1 and 2, the demand side of the lift-ticket market can be constructed. As equation 3 illustrates, demand for lift-tickets has a multiplicative relationship with participatory and non-participatory characteristics, and price.

(3) $$Q_n^d = X_n^{\upsilon} \cdot A_n^{\tau} \cdot P_n^{-\psi} ,$$

$\psi =$ price elasticity of demand, where $0 < \psi$

Thus, equation 3 shows that the price of a lift ticket (P_n) has a negative relationship with demand. It also implies that participatory (X_n) and non-participatory characteristics (A_n) have a positive relationship with quantity of lift-tickets demanded

B. Supply

Having defined demand in the lift-ticket market, the next logical step is to better understand determinants of supply. Prior research, such as Romer and Barro (1987) and Mulligan and Llinares (2003), has generally specified a major determinant of the supply of lift-tickets as the lift capacity of a resort.

Any change in price due to a shift in supply suggests an inverse relationship between a given supply variable and lift-ticket price. Further, this supply shifter will also affect the experience of customers inversely related to price. Considering the definition of utility, market competition (K_n) would generally affect the supply of experience a given winter resort can provide to customers.

While the possibility of a winter resort to sell out of lift-tickets exists, this is considered a concern in only extreme circumstances. Specifically, while unsold lift-tickets might be minimal during weekends and holidays, this is not considered normal by Mulligan and Llinares (2003). Therefore, the quantity of lift tickets supplied by a given resort is assumed to be inelastic to price.

Considering all stated, a general function for Q_n^s can be constructed as the identity of K_n. This can be seen as equation 4 below:

(4) $$Q_n^s = K_n^{\omega} ,$$

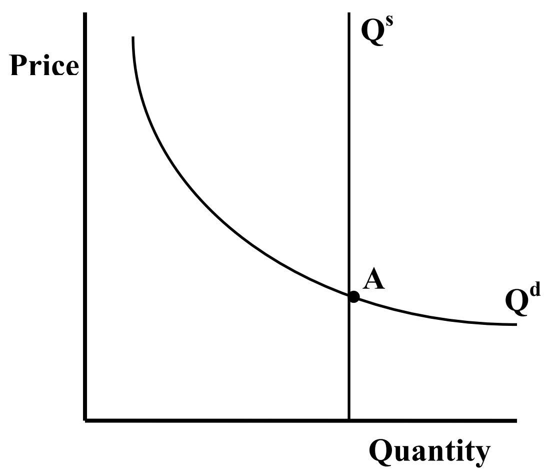
$\omega =$ marginal product of market competition.

Equation 4 implies that as market competition (K_n) increases, the quantity of lift-tickets supplied (Q_n^s) will increase as well. In the next subsection, equation 4 will be simultaneously combined in order to equate market structure and an equilibrium price for lift-tickets at winter resorts.

C. Market Equilibrium

Having defined supply and demand of the lift-ticket market, the equilibrium price can be solved by equating demand and supply ($Q_n^s = Q_n^d$). This value can be illustrated geometrically as point A in figure 1.

Figure 1: Market Equilibrium of Winter Resort *n*



Having been geometrically identified, point A can also be algebraically derived using equations 3 and 4. Solving these simultaneously, we find that the equilibrium price of a lift-ticket is equation 5, shown below.

(5) $P_n^{\psi} = X_n^{\upsilon} * A_n^{\tau} * K_n^{-\omega}$

Equation 5 shows the distinct relationships of price-affecting variables of lift-tickets. If participatory (X_n) or non-participatory (A_n) characteristics are increased, the lift-ticket price will increase. However, if the market competition (K_n) for a winter resort increases, there will be a decrease in the price of a lift-ticket. . In the next section, equation 5 will be estimated using a log-log ordinary least squares (OLS) regression.

III. Econometric Model

A. Variable Specification

Considering the use of a hedonic pricing model, variable specification is extremely important when accurately regressing lift-ticket prices based upon the demand and supply factors previously discussed. As described in Rosen (1974), all variables specified must attempt to entirely explain the characteristics and utility of a given product. Therefore, the variables mentioned in this section aim to expand on prior research by including non-participatory characteristics in a hedonic pricing model of lift-ticket prices at winter resorts.

Before specifying variables, functional form is an important consideration. The multiplicative equations presented thus far present an interactive relationship among variables when determining the price of a lift-ticket. This means that all variables must be present in order for a winter resort to operate.

Without the facilities and infrastructure of a winter resort, there would be no way to provide utility to consumers. This assumption is logical considering that participatory characteristics such as vertical drop and lift capacity are necessary for consumers to achieve utility (see equation 2). Likewise, non-participatory characteristics are theoretically essential to the operation of a winter resort. Without a lodge, restaurants, or lodging, there is no resort for consumers to visit. Furthermore, the requirement of competition is fulfilled by the geographic limitations for establishing a winter resort—cold, wet, and locations of high altitude. As the demand for winter resorts has increased over time, new firms have entered the market in order to gain economic profit. Considering that winter resorts are confined to limited locales, competition is inevitable. By these assumptions, the need for a multiplicative price function (equation 5) is clear.

The demand variables of equation 5 (A_n^τ and X_n^υ) are further explored through a combination of theoretical reasoning and historical research. For the use in this research, non-participatory characteristics of a given resort (A_n) will be represented by the amount of on-site restaurants of winter resort *n* (R_n). One could argue that the amount of lodging available is a more realistic estimator of A_n. However, this constrains the use of A_n to customers residing at a given winter resort.[5] However, it can be inferred through reasoning that R_n proxies for A_n.

On any given day, all restaurants at winter resort *n* will serve a proportion (θ) of all customers. This proportion of total customers (θ) is composed of those customers served that are residing (ϑ) at winter resort *n* and those that are not (σ). θ is able to compensate for all customers since it also includes consumers participating in on-mountain activities, which require the purchase of a lift ticket, and customers utilizing activities and amenities for which lift tickets are not necessary. This concludes that the number of on-site restaurants at winter resort *n* (R_n) is a robust proxy for non-participatory characteristics (A_n), seen in equation 6.

(6) $A_n^\tau = R_n^\theta = M_n^\vartheta * L_n^\sigma$,

M_n = Consumers residing at on-site lodging facilities of resort *n*,

L_n = Total customers of resort *n*, lessened by H_n,

Assuming that $\vartheta + \sigma = \theta$.

Historically, variables that proxy for X_n are general mountain characteristics. Mulligan and Llinares (2003) uses the adoption of detachable (high speed) lifts and vertical drop as factors of X_n. For the use of this study, these factors will be utilized in conjunction with a winter resort's lift capacity which was explored in Barro and Romer (1987). Therefore, X_n^υ is specified by equation 7. These participatory characteristics are logical choices in a hedonic price model. Not only are these statistics widely available, but each are major on-mountain factors when determining a resort to visit.

(7) $X_n^\upsilon = V_n^\varepsilon * C_n^\phi * H_n^\delta$,

V_n = Vertical drop of winter resort *n* (in feet),

C_n = Peak lift capacity of winter resort *n* (in people per hour),
H_n = Total number of high speed lifts at winter resort *n*,
$\varepsilon, \phi, \delta$ = marginal utility of V_n, C_n, and H_n, respectively.

As previously discussed in section II, the supply factor in this study relates to market competition. The measure of the degree of competition used is the number of competitors in a region. Market competition, for use in this paper, is determined by being located in either the western (W_n) or northeastern region of the United States as determined by *The Whitebook of Ski Areas*. Considering that 61 percent of the resorts sampled are located in the western region, a negatively significant relationship between being located in the west and lift-ticket prices should occur. However, Epple (1987) discusses the role of supply variables in hedonic pricing models. This article states that in these types of models, all supply factors should be considered exogenous. This would implicate that there is no relationship between location and lift-ticket prices, when considering this variable as a proxy for competition. Therefore, W_n will be used as a proxy for K_n from equation 5. Using equations 5, 6, and 7, the price function for lift tickets can be specified as equation 8.

(8) $$P_n^{\psi} = V_n^{\varepsilon} * C_n^{\phi} * H_n^{\delta} * R_n^{\theta} * W_n^{\omega},$$

where W_n = 1 if winter resort *n* is located in the western region.

Having specified all variables of the partial equilibrium model (equation 5), the function of equilibrium in the lift-ticket pricing market can be quantifiably defined by equation 8. In a subsequent subsection, an ordinary least squares (OLS) regression is used to test this model. Therefore, equation 8 will be transferred into the log-log stochastic population regression function shown in equation 9.

(9) $$Log(P_n) = \beta + \varepsilon\, Log(V_n) + \phi Log(C_n) + \delta\, Log(H_n) + \theta\, Log(R_n) - \omega\, Log(W_n) + \mu_n.$$

B. Data

The data utilized to analyze equation 9 came from the 30th edition of *The Whitebook of Ski Areas.*[6] A cross- sectional sample of 201 US winter resorts was collected; however, only data from 186 resorts were applicable because of incomplete information. Also, there was a geographic constraint for the data. Being the two dominant markets for winter resorts, only resorts from the western[7] and northeast[8] region were used. Specification of the price of a lift-ticket (P_n) is the price of a weekday lift-ticket at each resort. While Mulligan and Llinares (2003) note that holiday and weekend rates for lift-tickets differ from weekday prices, accurate data was not available in order to control for this characteristic. Since Barro and Romer (1987) ague that lift-ticket prices are sticky, however, using weekday prices should not bias the results of the OLS regression.

Major limitations of the data used for this paper are the values for number of high-speed lifts and the dummy variable for designating location. Even today, a majority of winter resorts have not adopted high-speed lifts. Therefore, under the specifications of equation 9, a majority of the resorts would be discounted from the regression. In order maintain the legitimacy of this sample, the variable for the number of high-speed lifts is unlogged for the OLS regression.

Likewise, the variable for a resort being located in the western region is unlogged. This is a necessary functional form change since this variable has a dummy interaction with lift-ticket prices. These changes, and the estimated equation, are shown in equation 10 below.

(10) $Log(P_n) = \beta + \varepsilon\, Log(V_n) + \phi Log(C_n) + \delta(H_n) + \theta\, Log(R_n) - \omega(W_n) + \mu_n$.

C. Regression analysis

The estimation of equation 10 using OLS regression provides important insight about the effects of non-participatory characteristics on the price of lift-tickets. The vital statistics of this multiple regression can be below in Table 1

Table 1: OLS results of equation 10

Variable	Coefficient	Parameter Estimate	Standard Error	T-Statistic
Intercept	β	-0.249	0.405	-0.62
Vertical Drop	ε	0.267***	0.046	5.79
Lift Capacity	ϕ	0.203***	0.032	6.29
Hi-speed Lifts	δ	-0.005	0.010	-0.51
West region	ω	-0.058	0.038	-1.53
Restaurants	θ	0.099***	0.031	3.14
DF	186	*t-crit = $\pm$ 1.645 ($\alpha = .1$)		
Adjusted R^2	0.696	**t-crit = $\pm$ 1.960 ($\alpha = .05$)		
F-statistic	86.04***	***t-crit = $\pm$ 2.576 ($\alpha = .01$)		

The results seen in Table 1 provide extremely favorable results concerning the effects of non-participatory characteristics upon lift-ticket prices. Furthermore, there is no evidence of any econometric problems, which are further discussed in Appendix B.

The focus of this research is upon the marginal effect of on-site, non-participatory characteristics of a winter resort (θ). As shown in Table 1 in the "Restaurants" row, there is a significant, positive relationship between the number of restaurants offered at a resort and the price of a weekday lift-ticket. This result supports the theory developed in section II and the hypothesis of this research. If a random winter resort *x* were to have twice as many non-participatory characteristics than winter resort *y*, assuming all else equal, the price for a lift-ticket to resort *x* would be nearly 10 percent higher than resort *y*. This assumption is validated by a significant t-statistic at the 0.01 level.. These original findings are significant to the continuing economic study of the winter resort industry and similar markets.

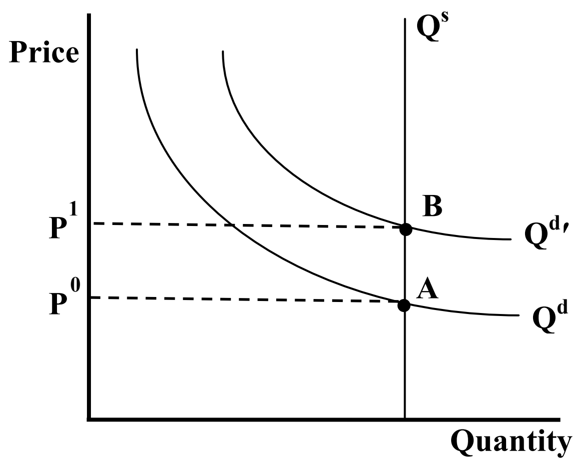
As earlier stated, the geographical region a given winter resort is located in was used as a proxy for supply. According to Epple (1987), there should be no significant relationship between market competition K_n and the price of a week day lift-ticket at winter resort *n*. The insignificant t-statistic for the dummy variable's coefficient (ω) supports this claim.

Interestingly, the number of high-speed lifts at a winter resort has no effect on the weekday price of a lift-ticket. This contradicts the claims of Mulligan and Llinares (2003). With an insignificant t-statistic for the coefficient of high-speed lifts (δ), it cannot be concluded that the role of technological diffusion, in the case the adoption of high-speed lifts, has any effect on the price of lift-ticket fees. This phenomenon can be explained by the absence of non-participatory characteristics from the econometric model. Therefore, the model used by Mulligan and Llinares (2003) is not fully specified because of the omission of non-participatory characteristics. The possible result of this misspecification could be the significant relationship between technological diffusion, in the form of high speed lifts, and prices of lift-tickets.

The remaining demand variables estimated in the OLS regression, lift capacity and vertical drop, both show a significantly positive relationship with lift-ticket prices. Specifically, this research shows that as the vertical drop of a winter resort (in feet) increases by one percentage point, the price of a lift-ticket will increase by 0.26 percentage points. Also, as the lift capacity (in people per hour) increases by one percent, the price of a lift-ticket will increase by 0.20 percentage points.

The regression analysis of equation 10 has estimated the effects of non-participatory characteristics on the price of lift-tickets. It can confidently be stated that as a winter resort expands by offering more non-participatory characteristics, customers will be willing to spend more for a lift-ticket. This is graphically shown in Figure 2 by the shift in the demand curve (Q^d to $Q^{d\prime}$) caused by an increase in non-participatory characteristics at a winter resort. As seen, this shift creates a change in the price of a lift ticket, the elasticity of which is the change from P^0 to P^1. This resulting increase in price was the theorized effect of an increase in non-participatory characteristics—the primary hypothesis of this research.

Figure 2: Change in price due to a shift in A_n.



IV. Conclusion

The market for lift-tickets is an interesting and unique market. Suppliers are faced with providing an intangible product of an experience to customers—an experience not limited to the slopes. While past studies have limited this experience to factors concerning the on-mountain experience, this research has revealed other factors of lift-ticket prices, non-participatory characteristics. The results of empirical analysis concludes that these non-participatory characteristics provided by a given winter resort will have a positive effect on the price of lift-tickets.

These results carry implications to similar markets classified under the realm of club theory. In Barro and Romer (1987), the authors successfully argue that winter resorts are similar to toll roads and amusement parks, assuming all three markets to be instances of clubs.

Therefore, this research can be applied to these markets as well. For an example of this theory at amusement parks, one cannot ignore the literal "world" created in Orlando, Florida by the Walt Disney Company. With the additions of luxury hotels, water parks, restaurants, spas, and plethora of alternative activities in Walt Disney World, this Mecca of entertainment offers consumers the ultimate amusement experience at a premium price[9]. When compared to the offerings of a similar amusement with a different amount of non-participatory characteristics, assuming all else equal, this research would conclude that there would be a difference in price between the two amusement parks.

An example of this theory of lift-tickets can be applied to toll-roads as well. For example, the New Jersey Turnpike spans 113 miles and is host to 12 "service areas" which provide travel, dining, shopping, and banking services. Assuming that a toll-road is a club, providing implicit pricing and congestible facilities, the theory of non-participatory characteristics can be applied to toll-roads and their service areas.. If two toll-roads are identical except for the number of service areas or other non-participatory characteristics, there would be a difference in the toll price. Specifically, the road that has more service areas would have the higher toll price.

Though this research has estimated the effects of non-participatory characteristics on the price of lift-tickets at winter resorts, it is clear that this theory can be applied to a variety of other markets. Specifically applicable to markets operating as a club, this theory further investigates the factors of consumer choice in a world of ever expanding choice sets for individuals.

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VI. Appendix

A. Definition of Variables

Variable	Definition
Q_n^d	Quantity of utility demanded at winter resort *n*.
U_n	Utility of winter resort *n*.
X_n	On-site, participatory experience determinants.
A_n	On-site, non-participatory experience determinants.
P_n	Price of lift ticket at winter resort *n*.
K_n	Market competition of winter resort *n*.
W_n	Regional specification variable (1=west).
Q_n^s	Quantity of utility supplied at winter resort *n*.
R_n	On-site restaurants located at winter resort *n*.
M_n	Consumers residing at on-site lodging facilities of resort *n*.
V_n	Vertical lift of winter resort *n*.
C_n	Peak-load lift capacity of winter resort *n*.
H_n	Number of high-speed lifts located at winter resort *n*.
ψ	Price Elasticity of Demand
τ	Marginal utility of A_n.
υ	Marginal utility of X_n.
ω	Marginal Product of K_n.
θ	Proportion of customers at winter resort *n* served by R_n.
ϑ	Proportion of customers residing at winter resort *n* served by R_n.
σ	Proportion of customers not residing at winter resort *n* served by R_n.
ε	Marginal utility of V_n.
ϕ	Marginal utility of C_n.
δ	Marginal utility of H_n.
β	Intercept parameter.

B. Econometric Problems

During the estimation of equation 10, considerable time was spent testing the validity of the OLS regression results. First, Ramsey's RESET test was performed to test for omitted variables. However, the null hypothesis of no omitted variables was not rejected. Next, the variance inflation factor (VIF) for each estimated parameter was calculated, and can be seen in Table 2. With VIF factors not exceeding 3 for any parameter, multicollinearity is not apparent in this specified model.

Table 2—Variance inflation factors

Variable	VIF
β	0
ε***	2.088
ϕ***	2.985
δ	2.293
θ***	1.186
ω	2.8456

Next, White's test for Heteroskedasticity was performed. Rendering a χ^2 value of 19.35, this is another econometric problem not found in the results.[10] Lastly, the Durbin-Watson test for Autocorrelation was administered on the data. With a D-statistic of 2.09, it is obvious that there is no autocorrelation contained in the data as well. As shown, this data is free from basic econometric problems; leaving accurate standard errors and unbiased parameter estimates.

VII. Endnotes

[1] I am personally grateful for the guidance and encouragement of Dr. Stephen DeLoach. Furthermore, I am also thankful for the help and constant consideration of Dr.'s Gregory Lilly and Thomas Tiemann.

[2] For this study, a winter resort is classified as any skiing/snowboarding area with a vertical drop equal to or exceeding 700 feet.

[3] According to the NSAA, there was an estimated 50 million visitors to US ski areas in the 1984-85 season.

[4] SIA points out that in 1985, over 48% of visitors to ski areas had a gross household income of over $35,000. Logically, the average college student has a much smaller household income than that stated. Further, this sample is comprised of customers seeking a daily outing to the ski area. No preference of amenities is considered in this study, as none will be utilized in these customers' visits.

[5] Furthermore, lack of proper data also renders this variable inefficient as well. This is due to unreliability of current data. Winter resorts have a plethora of different lodging types (e.g. hotels, suites, condos, and homes). Therefore, by simply quantifying the quantity of lodging available—whether it be number of rooms, homes, etc…—the number of real customers which these facilities are serving will be stochastic among resorts.

[6] *The Whitebook of Ski Areas* is electronically published by Inter-Ski Services, inc.

[7] The western region is defined as winter resorts located within AK, AZ, CA, CO, ID, MT, NM, NV, OR, UT, WA, and WY by Inter-Ski Services, inc.

[8] The northeast region is defined as winter resorts located within CT, MA, ME, NH, NJ, NY, PA, and VT by Inter-Ski Services, inc.

[9] This admission ticket price is \$59.75 in 2005, according to the Walt Disney World official website.

[10] Considering the following critical χ^2 values:

$$\chi^2 = 27.203 \qquad (\alpha = 0.10)$$
$$\chi^2 = 30.143 \qquad (\alpha = 0.05)$$
$$\chi^2 = 36.190 \qquad (\alpha = 0.01)$$