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The Relationships Between Push-pull Motivating Factors in Exhibitions

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ABSTRACT

This research examines the relationship between push-pull motivating factors in exhibitions. The results of factor analysis indicated that exhibition attendees mainly consider four push factors and three pull factors. The four push factors are labeled 'rest/relaxation', 'ego-enhancement', 'knowledge-seeking', and 'building relationship', while the three pull factors are labeled 'exhibition resources', 'exhibition attractions', and 'information supply'. The results of correlation analysis indicated that there are significantly positive relationships between push and pull motivating factors. The findings of the research give useful information not only to understand the relationships between push-pull motivating factors, but also to increase exhibition attendance.

1. Introduction

The exhibition industry has been performing an important economic function in attracting huge numbers of people whose purpose is to share updated information and knowledge; to buy or sell products and services; to launch new products; and to negotiate contracts and agreements (Rogers, 2003). With these distinctive functions, exhibitions have been widely recognized as a promotional channel in the U.S., Asia, and Europe (Sandle, 1994). In addition, the exhibition marketing approach provides more efficient and effective ways to facilitate the sale of retail and manufactured products directly to consumers (Bellizzi & Lipps, 1984). Furthermore, exhibitors organize unique programs and performances in order to attract exhibition attendees. They offer opportunities for connecting and interacting between attendees and exhibitors with the sole purpose of satisfying their needs for entertainment, leisure and education (McLean, 1994). Therefore, since their inception, exhibitions have drawn attendees and helped them acquire new information and knowledge about products and services offered as well as a variety of entertaining activities.

Exhibition attendees have specific motivations to push themselves to visit exhibitions. Blythe (1999) reported that exhibition attendees have clear aims while attending exhibitions. According to the research, the three main objectives of attendees for attending exhibitions are to see new products and developments; to obtain technical or product information; and to get up-to-date information on pertinent issues. These expectations push the attendees to visit exhibitions

(Gramann, 1994). In addition, research also shows that the diversity of programs offered, the activities engaged in, the information provided, the infrastructure established, the leisure opportunities offered, and the convenient facilities available at the exhibition centers also pull exhibition attendees to exhibition centers. Typically, the exhibition programs and the facilities offered have been more successful in attracting attendees and maximizing marketing returns in the industry. Over the last decade, the issues relating to the push-pull motivating factors in the tourism industry have been recognized as important factors for analyzing tourists' motivations for choosing a specific destination (Buckley, 2000; Cho, 1998). This research applies the same push-pull motivating factors to the exhibition industry. Despite the importance of the exhibition industry and the knowledge about the existence of the push-pull motivating factors for decision-making, scant research has been conducted on their impact on the visitation behavior of exhibition attendees. In that regard, the specific objectives of this research are as follows:

1) To identify the important push-pull motivating factors in the exhibition industry.
2) To discover the significant relationships among the push-pull motivating factors in the exhibition industry.
3) To determine the relationship between push-pull motivating factors and attendee behavior in the exhibition industry.

2. Literature Review

Push-pull motivating factors have been examined in the travel and tourism industry during the past decade. There is a similarity in the push-pull motivating factors between tourism and exhibition industries. Push factors influence exhibition attendees to have specific motivations in order to accomplish their objectives at exhibitions. Pull factors include facilities offered and the information content provided at the exhibitions also influence exhibition attendees to visit exhibitions.

2.1. Push-pull Motivating Factors

Push-pull motivating factors have been used for examining and explaining the motivations underlying tourist and visitation behaviors (Dann, 1977; Klenosky, 2002). Push motivating factors refer to the driving forces that impact personal decisions related to the travel plan itself, while pull motivating factors refer to the forces that impact personal decisions which are specifically destination-related (Kim, Lee, & Klenosky, 2003).

Dann (1977) analyzed tourism motivation with physiological and psychological processes and identified two push factors, anomie and ego enhancement. Those two push factors were the answer to his question, "What make tourists travel?" Crompton (1979) explored push-pull motivating factors through unstructured in-depth interviews and found seven push factors and two pull factors. The seven push factors were escape, self-exploration and evaluation, relaxation, prestige, regression, enhancement of kinship and relationships, and social interaction. The two pull factors were novelty and education. Oh, Uysal, and Weaver (1995) investigated push-pull motivating factors, conducting canonical correlation analysis of 30 motivational items for push factors and 52 destination items for pull factors. They found that push factors were knowledge, intellect, kinship, social interaction, novelty, adventure, entertainment, prestige, sports, escape, and restfulness. Pull factors were historical and cultural environment, sports, activity, safety, nature, and inexpensive budget. Sirakaya and McLellan (1997) focused on pull factors which drew personal attentions to tourism destinations. The pull factors that they reported were local hospitality and services, trip cost and convenience, perceptions of a safe and secure environment, change in daily life environment, recreation and sporting activities, entertainment and drinking opportunities, personal and historical link, cultural and shopping services,

and unusual and distant vacation spots. Recently, Kim, Lee and Klenosky (2003) examined the influence of push and pull factors at Korean national parks, using twelve motivational items for push factors and twelve attribute items for pull factors. They identified that four push factors were family togetherness and study, appreciating natural resources and health, escaping from everyday routine, and adventure and building friendship. Pull factors of their research were key tourist resources, information and convenience of facilities, and accessibility and transportation.

2.2. Relationships Between Push-pull Motivating Factors

The relationships between push-pull motivating factors have recently been examined not only in the research of the travel and tourism but also in the research of business destinations (Baloglu & Uysal, 1996; Klenosky, 2002; Oh, Uysal, & Weaver, 1995; Pyo, Mihalik, & Uysal, 1989; Uysal & Jurowski, 1994). Baloglu and Uysal (1996) examined push-pull motivating factors in order to analyze the relationships between the motivations for overseas pleasure travel among a German sample of 1,212 respondents. Their findings suggested that there is a significant relationship between destination attributes and motives. It indicated that a successful matching of push and pull motivating items is possible for developing a marketing strategy for tourism destinations. Christensen (1983) reported that destination marketers would be better able to tailor their products more closely to the needs of their customers if the marketers had a clearer understanding of why their products are in demand among each of their market segments. Uysal and Jurowski (1993) showed that there is a reciprocal relationship between push and pull factors, which can have product development implications in tourism.

Kim, Lee and Klenosky (2003) indicated that both push and pull motivating factors have significantly positive relationships even though some relationships are at extremely low levels. The researchers reported that the push factors, 'family togetherness and study', 'appreciating natural resources and health', 'escaping from everyday routine', and 'adventure and building friendship' are significantly related to the pull factor 'key tourist resources'. In addition, the pull factor 'information and convenience of facilities' had significantly positive relationships with the push factors 'family togetherness and study', 'appreciating natural resources and health', and 'escaping from everyday routine'. Therefore, push and pull motivating factors have influenced each other and travel and destination choices among travelers since the first time mankind set out to travel. Dann (1981) indicated that potential tourists who determine "where to go" may simultaneously take into consideration various pull factors which correspond adequately to their push motivating factors.

2.3. Push-pull Motivating Factors in Exhibitions

Exhibitions have historically been recognized as a public place where products, information, technology, service and other interesting products are displayed. In addition, exhibitions provide opportunities to share professional knowledge, to experience programs or performances, and attend recreation or leisure activities (Lee, 2007). The major motivations of exhibition attendees are gathering information about market access, new products, potential suppliers (Munuera & Ruiz, 1999) and alternative purchase choices (Godar & O'Connor, 2001). Exhibition attendees expect exciting human activity and entertaining events from the exhibitors in order to attract them toward their products. Thus, attending diverse events, programs, and activities has become a driving force to pull exhibition attendees into exhibitions.

Push-pull motivating factors of exhibitions examined in the previous discussion are similar to the push-pull motivating factors analyzed in the research of travel and tourism. For example, push-pull motivating factors in tourism are escape, relaxation,

stress-release, ego-enhancement, learning about historic and cultural resources, social interaction, building relationships, adventure, entertainment opportunities and other such related factors. In exhibitions, push-pull motivating factors are self-contentment, self-achievement, development of knowledge, attending seminars, stress-release, relaxation, meeting attendees who have common interests, social interaction and other related factors. In comparison, common push factors may be rest/relaxation, ego-enhancement, knowledge-seeking, and building relationships; while, common pull factors may be destination resources, destination attractions, and information supply.

3. Methodology

This was a cross-sectional survey-based research project conducted of exhibition attendees in South Korea. The COEX (Convention and Exhibition) Center in Seoul was identified as the venue for conducting the survey. The survey instrument was developed after an exhausting review of literature related to the constructs of push and pull motivating factors in the tourism industry, specifically the convention and exhibition industry. A fuller description of the survey instrument used in this study is presented in a subsequent section.

3.1. Study Site and Data Collection

The Institutional Review Board (IRB) approved the questionnaire prior to conducting the survey of this research. The data was collected from exhibition attendees at the COEX Center located in Seoul, South Korea. The exhibitions chosen for this research were the *2009 World IT Show* (June 17th through June 20th) and the *2009 Broadcasting Entertainment Career Casting Show* (June 26th through June 27th). A convenient sampling methodology was adopted and 200 questionnaires were distributed by the researchers on-site and throughout the duration of the shows selected in order to obtain a good diversity of respondents that attended the events. A total of 200 surveys were distributed which resulted on 154 usable responses for a response rate of about 77 percent.

3.2. Analytical methods

The collected data were analyzed using the Statistical Package for Social Science (SPSS). Statistical methods used to analyze the data included reliability analysis, principal component analysis, factor analysis, and correlation analysis. Reliability analysis examined whether the survey questionnaire was reliable through the calculation of Cronbach's Alpha statistic. Principal component analysis (PCA) transformed a number of possibly correlated variables into a small number of factors that were easier to understand and analyze further (Pearson, 1901). Factor analysis explored the underlying structures of data set through data reduction. Lastly, correlation analysis examined the strength and the direction of the linear relationships between the push-pull motivating factors.

3.3. Composition of Assessment Items

The questionnaire developed was comprised of three sections. The first section was designed to estimate the importance of the push motivating factors and the second section was designed to evaluate the pull motivating factors. Thirty assessment items were generated from an extensive literature review to help examine the importance of push-pull motivating factors in exhibitions. The third section of the questionnaire was designed to solicit the demographic information of the exhibition attendees. The demographic information collected included gender, age, and marital status. Push-pull motivating factors were measured using a five-point Likert scale of agreement. The descriptor ranged from "strongly disagree (1)", "disagree (2)", "neutral (3)", "agree (4)", and "strongly agree (5)". The demographic information was measured using nominal scales.

Push motivating framework consists of four dimensions: rest/relaxation, ego-enhancement, knowledge-seeking, and building relationships. Rest/relaxation was measured by four questions relevant to stress release, relaxation, rest, and escape (Cha, McCleary, & Uysal, 1995; Crompton, 1979; Oh, Uysal, & Weaver, 1995). Ego-enhancement was measured by four questions relevant to self-contentment, enhanced membership-related business, and self-achievement (Dann, 1977). Knowledge-seeking was measured by five attributes: learning about one's business know-how, attending conferences or seminars, buying products, and exploring new information. Building relationship was measured by the following attributes: building friendship and family togetherness (Crompton, 1979; Uysal & Jurowski, 1994), enhancing business interactions (Oh, Uysal, & Weaver, 1995), and meeting attendees who have a common interest.

Pull motivating framework is comprised of three dimensions: exhibition resources, exhibition attractions, and information supply. Exhibition resources were measured with attributes related to the environment such as: offering of new products and services, facilities for social activities, and programs or events for new experience (Oh, Uysal, & Weaver, 1995; Yuan & McDonald, 1990). Exhibition attractions were measured with the attributes relevant to: recreation and entertainment, social opportunities, physical amenities, and the infrastructure available (Fakeye & Crompton, 1991; Hu & Ritchie, 1993; Kim, Crompton, & Botha, 2000; Sirakaya & McLellan, 1997). Information supply was measured by the following attributes: information of facilities (Jeong, 1997), new information and technology, professional knowledge, and advanced IT facilities.

4. Results

4.1. Characteristics of respondents

The sample consisted of 90 male respondents (58.4%) and 64 female respondents (41.6%). About 32% of the respondents were aged between 18 and 24 followed by the age groups 25-34, 35-44, 45-54 and over 55, which accounted for approximately 34%, 19%, 12%, and 3%, respectively. Among 154 respondents, about 38% of the respondents were married with the rest unmarried. Table 1 shows the results of demographic characteristics of the respondents.

Table 1. Demographic Characteristics of Respondents (N = 154)

Variables	Frequency	Percentage (%)
Gender		
Male	90	58.4
Female	64	41.6
Age		
18-24	49	31.8
25-34	52	33.8
35-44	29	18.8
45-54	19	12.3
Over 55	5	3.2
Marital Status		
Married	59	38.3
Unmarried	95	61.7

4.2. Reliability Analysis and Factor Analysis for Push Factors

The researchers of this study used a factor loading cut-off point of 0.50 for retaining items in factor analysis. Only factors which had an eigenvalue equal to or greater than 1 were retained in the study. After analyzing the data by using principal component analysis with varimax (variance maximization) rotation, the 17 variables were reduced to four factors, which explained approximately 63% of the total variance. The communality of each variable was moderately acceptable, ranging from 0.54 to 0.75.

If a score of Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) is equal or greater than 0.5, it indicates that the correlation matrix is suitable for factor analysis. The KMO-MSA score of factor analysis for push factors was 0.627 and it showed the correlation matrix of push factors was

suitable. Bartlett's test of sphericity tests whether the strength of the relationship among variables was strong. The Bartlett's test of sphericity χ^2 for this research was 215.730 at the observed significance level of alpha = 0.001, indicating that the strength was strong.

Reliability analysis tests the consistency of a set of measurements. If repeated measurements gave different results, measuring instruments are generally considered to be unreliable (Rudner & Shafer, 2001). Table 2 summarizes the Cronbach's alpha measures of reliability. The Cronbach's alpha for rest/relaxation was 0.592, ego-enhancement was 0.541, knowledge-seeking was 0.471, and building relationship was 0.612. These values indicated relatively reasonable levels of internal consistency of measuring instruments in this research. Thus, the result indicated that the variance of the original values was explained adequately by the four factors – rest/relaxation, ego-enhancement, knowledge-seeking, and building relationship.

Table 2. Principal Component Factor Analysis with Varimax Rotation for Push Factors

Push factor domains and items	Factor loadings				Communality
	Rest/ relaxation	Ego-enhancement	Knowledge-seeking	Building relationship	
Rest/relaxation					
Stress release	0.751				0.603
Relaxation	0.751				0.612
Rest	0.689				0.544
Ego-enhancement					
Self-contentment		0.798			0.639
Enhance memberships related business		0.661			0.610
Self-achievement		0.566			0.490
Knowledge-seeking					
Learn about one's business know-how			0.761		0.689
Attend conference or seminar			0.747		0.620
Building relationship					
Build friendship & family togetherness				0.832	0.720
Meet attendees who have common interest				0.772	0.750
Total variance explained					
% of variance explained	25.517	13.049	12.657	11.910	62.788
Cronbach's alpha	0.592	0.541	0.471	0.612	
Eigenvalue	2.517	1.305	1.266	1.191	

Note: Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA): 0.627;
Bartlett's Test of Sphericity, $\chi^2 = 215.730$, significance at $p < 0.001$.

4.3. Reliability Analysis and Factor Analysis for Pull Factors

In conducting factor analysis to examine pull factors, the 13 variables were reduced to three pull factors, which explained approximately 66% of the total variance. The communality of each variable was moderately acceptable, ranging from 0.55 to 0.75. The KMO-MSA score of factor analysis for pull factors was 0.686 and it showed that the correlation matrix of the pull factors was also suitable. The Bartlett's test of sphericity χ^2 of this research was 166.465 at the observed significance level of alpha = 0.001.

Table 3 summarizes that Cronbach's alpha of exhibition resources was 0.677, exhibition attractions was 0.607, information and knowledge was 0.465. The results indicate reasonable levels of internal consistency among the pull factor included in the survey instrument. Accordingly, the results indicated that the variance of the original values was explained adequately by the three pull factors – exhibition resources, exhibition attractions, and information supply.

Table 3. Principal Component Factor Analysis with Varimax Rotation for Pull Factors

Pull factor domains and items	Factor loadings			Communality
	Exhibition resources	Exhibition attractions	Information supply	
Exhibition resources				
Environment of new products and service	0.783			0.635
Facilities for social activities	0.771			0.656
Programs and events for new experience	0.713			0.644
Exhibition attractions				
Recreation and entertainment		0.862		0.752
Social opportunities		0.803		0.697
Information supply				
New information and technology			0.826	0.690
Information of facilities			0.729	0.552
Total variance explained				
% of variance explained	34.697	15.813	15.578	66.088
Cronbach's alpha	0.677	0.607	0.465	
Eigenvalue	2.429	1.107	1.090	

Note: Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA): 0.686;
Bartlett's Test of Sphericity, $\chi^2 = 166.465$, significance at $p < 0.001$.

4.4. Correlation Analysis Between Push and Pull Motivating Factors

Correlation analysis tests the strength and direction of a linear relationship between two variables. Table 4 indicates the mean and standard deviation of push-pull motivating factors. According to the average of mean scores between push and pull motivating factors, respondents considered more pull factors (3.58) than push factors (3.52). In terms of the pull factors, information supply was the most important pull factor among exhibition attendees (3.68) followed by exhibition resources (3.64) and exhibition attractions (3.43), respectively. In terms of

the push factors, building relationship (3.62) was the most important push factor that exhibition attendees were most concerned about, followed by knowledge-seeking (3.58), ego-enhancement (3.49), and rest/relaxation (3.40), respectively.

Table 4. Descriptive Statistics of Pull-push Motivating Factors

	N	Minimum	Maximum	Mean	Standard Deviation
1. Rest/relaxation	154	1.33	5.00	3.40	0.94
2. Ego-enhancement	154	1.00	5.00	3.49	0.87
3. Knowledge-seeking	154	1.00	5.00	3.58	0.95
4. Building relationship	154	1.00	5.00	3.62	1.06
5. Exhibition resources	154	1.33	5.00	3.64	0.93
6. Exhibition attractions	154	1.00	5.00	3.43	1.07
7. Information supply	154	1.00	5.00	3.68	0.95

Note: $N = 154$. All correlation coefficients are significant at the level of 0.01 in two-tailed test.

In statistics, a correlation coefficient indicates the strength and direction of a linear relationship between two random variables. The correlation coefficients can range from plus one to minus one. Plus one means a perfect positive correlation between two variables, while minus one means a perfect negative correlation between two variables. Thus, correlation analysis is a measure of association between two random variables. Table 5 indicates correlation coefficients between push-pull motivating factors. All the correlations between push and pull motivating factors are positively correlated at the observed significance levels of 0.01 and 0.05. The highest correlation value between push and pull motivating factors is 0.397. It indicates that there is a positive relationship between ego-enhancement and exhibition resources at the observed significance level of 0.001. In addition, a change of ego-enhancement will result in a change of exhibition resource. The second highest correlation value is 0.392 and it shows a positive relationship between rest/relaxation and information supply at the observed significance level of 0.001. The third highest correlation value is 0.353 and it indicates a positive relationship between eco-enhancement and exhibition attractions at the observed significance level of 0.001. The fourth highest correlation value is 0.324 and it shows a positive relationship between building relationship and exhibition resources at the observed significance level of 0.001.

Table 5 also indicates that there are positive relationships between rest/relaxation and exhibition resources [$\rho = 0.315$; $p < 0.001$], between building relationship and information supply [$\rho = 0.312$; $p < 0.001$], between knowledge-seeking and exhibition resources [$\rho = 0.295$; $p < 0.001$], between ego-enhancement and information supply [$\rho = 0.285$; $p < 0.001$], between knowledge-seeking and exhibition resources [$\rho = 0.265$; $p < 0.001$], between knowledge-seeking and information supply [$\rho = 0.258$; $p < 0.001$], and between building relationship and exhibition attractions [$\rho = 0.228$; $p < 0.001$] respectively.

Table 5. Correlation Between Push and Pull Motivating Factors

		Rest/ relaxation	Ego-enhancement	Knowledge -seeking	Building relationship	Exhibition resources	Exhibition attractions	Information supply
Rest/ relaxation	Correlation	1.000	0.251**	0.168*	0.198*	0.315**	0.287**	0.392**
	Sig. (2-tailed)		0.002	0.037	0.014	0.000	0.000	0.000
	N	154.000	154	154	154	154	154	154
Ego-enhancement	Correlation	0.251**	1.000	0.260**	0.215**	0.397**	0.353**	0.285*
	Sig. (2-tailed)	0.002		0.001	0.007	0.000	0.000	0.001
	N	154	154.000	154	154	154	154	154
Knowledge-seeking	Correlation	0.168*	0.260**	1.000	0.234**	0.295**	0.265**	0.258**
	Sig. (2-tailed)	0.037	0.001		0.004	0.000	0.001	0.001
	N	154	154	154.000	154	154	154	154
Building relationship	Correlation	0.198*	0.215**	0.234**	1.000	0.324**	0.228**	0.312**
	Sig. (2-tailed)	0.014	0.007	0.004		0.000	0.004	0.000
	N	154	154	154	154.000	154	154	154
Exhibition resources	Correlation	0.315**	0.397**	0.295**	0.324**	1.000	0.314**	0.279**
	Sig. (2-tailed)	0.000	0.000	0.000	0.000		0.000	0.000
	N	154	154	154	154	154.000	154	154
Exhibition attractions	Correlation	0.287**	0.353**	0.265**	0.228**	0.314**	1.000	0.205*
	Sig. (2-tailed)	0.000	0.000	0.001	0.004	0.000		0.011
	N	154	154	154	154	154	154.000	154
Information supply	Correlation	0.392**	0.285*	0.258**	0.312**	0.279**	0.205*	1.000
	Sig. (2-tailed)	0.000	0.001	0.001	0.000	0.000	0.011	
	N	154	154	154	154	154	154	154.000

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

5. Conclusions and Implications

The purpose of this research was to (1) examine the important push-pull motivating factors in exhibitions; (2) verify the significant relationships between pull-push motivating factors in exhibitions; (3) give useful information to understand the relationships between push-pull motivating factors that influence visitation behavior of exhibition attendees. Seventeen push motivating items resulted in four domains of push factors: 'rest/relaxation', 'ego-enhancement', 'knowledge-seeking', and 'building relationship'. Thirteen pull motivating items resulted in three domains of pull factors: 'exhibition resources', 'exhibition attractions', and 'information supply'. Survey respondents considered more pull factors (mean = 3.58) than push factors (mean = 3.52). The most important push factor was 'building relationship' (mean = 3.62), and 'knowledge-seeking', ego-enhancement', and 'rest/relaxation' followed. The most important pull factor was 'information supply' (mean = 3.68), and exhibition resources, and exhibition attractions followed.

The finding reflects the fact that exhibition attendees have strong motivations to build relationships, to seek useful information, to enhance their professional knowledge, and to take a rest while attending exhibitions. These factors push or motivate people to attend exhibitions. Furthermore, exhibition resources, exhibition attractions, and information supply pull people to visit exhibition centers. The examples of those pull factors are new products, exciting programs or events, entertaining facilities, plenty of information, and social opportunities to interact.

Correlation analysis tested the relationships between push and pull motivating factors in this research. The findings indicated that the highest correlation between push and pull motivating factors was the relationship between ego-enhancement and exhibition resources. It implies that exhibition attendees who want to enhance their professional knowledge and capacity or to achieve their personal

goals prefer to attend exhibitions where new products, exciting programs, and facilities for social activities are prepared. In addition, there is relatively a high positive relationship between rest/relaxation and information supply. It implies that exhibition attendees used exhibition centers as a place to take a rest, acquiring new information simultaneously. The finding is important because it reflects one of advantages in exhibitions. Exhibitions provide opportunities to rest as well as to gain information. It is a productive way for exhibition attendees to take a rest and to obtain their favorable information at the same time.

Eco-enhancement is also positively related to exhibition attractions. It implies that exhibition attendees think of recreation, entertainment, and social opportunities as exhibition attractions. Furthermore, there is a high positive relationship between building relationship and information supply. It implies that exhibition attendees want to meet people who not only have common interests about products but also who have professional knowledge about technology of the products. They also consider that exhibition programs and facilities are significant driving forces to draw attentions and pull people into exhibitions. Lastly, knowledge-seeking is positively related to exhibition resources, exhibition attractions, and information supply. It implies that exhibition attendees participate in exhibitions because it is easy to seek new information, join exciting programs, and rest through conferences, seminars, entertainment, and performances. The findings of this research give exhibition managers and practitioners not only useful information to understand what specific motivating factors that people push themselves to attend exhibitions but also practical and tactical marketing strategies of how to pull people into exhibitions.

6. Limitations

The limitations of the research are as follows; (1) only two exhibitions were examined during the research and (2) the sample size of 154 was relatively small and might have limited the representation of the results for the whole population. These limitations may be trouble in generalizing the findings of this research to the overall evaluation of exhibitions.

References

Baloglu, S., & Uysal, M. (1996). Market segments of push and pull motivations: a canonical correlation approach. *International Journal of Contemporary Hospitality Management, 8*(3), 32-38.

Bellizzi, J. A., & Lipps, D. J. (1984). Managerial guide-lines for trade show effectiveness. *Industrial Marketing Management, 13*(1), 49-52.

Blythe, J. (1999). Visitor and exhibitor expectations and outcomes at trade exhibitions. *Marketing Intelligence and Planning, 17*(2), 100.

Buckley, R. (2000). Neat trends: current issues in nature, eco- and adventure tourism. *International Journal of Tourism Research, 2*, 437-444.

Cha, S., McCleary, K., & Uysal, M. (1995). Travel motivations of Japanese Overseas Travelers: a factor-cluster segmentation approach. *Journal of Travel Research, 34*(2), 33-39.

Cho, G. (1988). Conservation and management in Jervis Bay Australia. *Aquatic Conservation: Marine and Freshwater Ecosystems, 8*, 701-717.

Christensen, J. E. (1983). An exposition of canonical correlation in leisure research. *Journal of Leisure Research, 14*(4) 311-322.

Crompton, J. L. (1979). Motivations of pleasure vacation. *Annals of Tourism Research*, *6*, 409-424.

Dann, G. M. S. (1977). Anomie, ego-enhancement and tourism. *Annals of Tourism Research*, *4*, 184-194.

Fakeye, P. C., & Crompton, J. L. (1991). Image differences between prospective, first time, and repeat visitors to the Lower Rio Grande Valley. *Journal of Travel Research, 30,* 10-16.

Godar, S. H., & O'Connor, P. J. (2001). Same time next year – buyer trade show motives. *Industrial Marketing Management, 30*, 77-86.

Gramann, J. (1994). *Independent Market Research*, Center Exhibitions, National Exhibition Center.

Hu, Y., & Ritchie, J. R. B. (1993). Measuring destination attractiveness: a context approach. *Journal of Travel Research, 32*, 25-34.

Jeong, I. (1997). *A study on attributes of attractions of the Bukhansan National Park and visitors' attitudes*. Thesis, Hanyang University, Seoul.

Kim, S. Crompton, J. L., & Botha, C. (2000). Responding to competition: a strategy for Sun/Lost City, South Africa. *Tourism Management, 21,* 33-41.

Kim, S. S., Lee, C. K., & Klenosky, D. B. (2003). The influence of push and pull factors at Koran national parks. *Tourism Management, 24*, 169-180.

Klenosky, D. B. (2002). The pull of tourism destinations: a means-end investigation. *Journal of Travel Research, 40*(4), 385-395.

Lee, D. H. (2007). Exhibition Participation and Constraints. Unpublished thesis. Hanyang International Graduate School, Seoul, 1-4.

McLean, K. (1994). *Planning for people in museum exhibition*. Association of Science-Technology Center, 15-16.

Munuera, J. L., & Ruiz, S. (1999). Trade fairs as services: A look at visitors' objectives in Spain. *Journal of Business Research, 44*, 17-24.

Oh, H. C., Uysal, M., & Weaver, P. A. (1995). Product bundles and market segments based on travel motivations: a canonical correlation approach. *International Journal Hospitality Management, 14*(2), 123-137.

Pearson, K. (1901). On lines and planes of closest fit to systems of points in space. *Philosophical Magazine 2*(6), 559-572.

Pyo, S., Mihalik, B. J., & Uysal, M. (1989). Attraction attributes and motivations: a canonical correlation analysis. *Annals of Tourism Research, 16*(2), 277-282.

Rogers, T. (2003). *Conferences and conventions:* A global industry (1st ed.). Oxford, United Kingdon: Butterworth-Heinemann.

Rudner, L. M., & Shafer, W. D. (2001). Reliability. *ERIC Digest*. College Park, MD: ERIC Clearinghouse on Assessment and Evaluation.

Sandler, G. (1994). Fair dealing. *Journal of European Business, 5*(4), 47-49.

Sirakaya, E., & McLellan, R. W. (1997). Factors affecting vacation destination choices of college students. *Anatolla: An International Journal of Tourism and Hospitality Research, 8*(3), 31-44.

Uysal, M., & Jurowski, C. (1993). An empirical testing of the push and pull factors of tourist Motivations. *Annals of Tourism Research, 21*(4), 844-846.

Uysal, M., & Jurowski, C. (1994). Testing the push and pull factors. *Annals of Tourism Research, 21*(4), 844-846.

Yuan, S., & McDonald, C. (1990). Motivational determinates of international pleasure travel. *Journal Tourism Research, 29*(1), 42-44.

The Relationships Between Push-pull Motivating Factors in Exhibitions

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Strategy Implementation and Export Performance for an LDC's Export Ventures

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ABSTRACT

By positing that strategy implementation mediates the links among the firm's environment, export marketing strategy and export performance, this study attempted to reconcile the competing explanations of export performance. Being theoretically rooted in the integration of the IO-based and resource-based theories analyzed within the framework of strategic management, the research approach enriches the context at which relevant factors are examined, encourages the integration of disciplines and evokes tolerance for methodological diversity. By using several measures of export performance simultaneously as criterion variables and employing structural equation modeling, the interrelationships among these performance measures were established. The importance of export sales relative to the other performance measures was highlighted. Irrespective of performance dimension, commitment to the export venture came out as a major determinant of export performance. A major finding of this study is the mediating role of strategy implementation in the environment-performance and strategy-performance relationships.

1. Theoretical Foundation

The investigation of export performance has been the subject of numerous studies in the field of international marketing. Despite such attention, the findings still reflect fragmented views and a lack of consistent theoretical basis, specifically with respect to the determinants of export performance. This is evidenced by the wide array of factors proposed to influence export performance, the variety of ways they are measured and the differing nature of their links to export performance (Lages, Jap and Griffith, 2008; Katsikeas, Leonidou and Morgan, 2000; Cavusgil and Zou, 1994; Donthu and Kim, 1993).

The determinants of export performance can be broadly classified into internal factors and external factors. Such classification is theoretically substantiated as the internal category is rooted in the resource-based theory while the external category draws support from the industrial organization theory (IO). The resource-based theory contends that the unique endowments of the firm (resources and capabilities) are central considerations in the formulation of its strategy aimed at improving performance (Barney, 1991; Collis, 1991; Wernerfelt, 1984). In short, the resource-based theory attributes firm's performance and strategy to internal organizational resources. In contrast, the IO theory which draws its framework from the structure-conduct-performance (SCP) paradigm, argues that external

industry structure influences the firm's strategy (conduct), which in turn affects its economic performance (Scherer and Ross, 1990).

2. Theoretical Synthesis

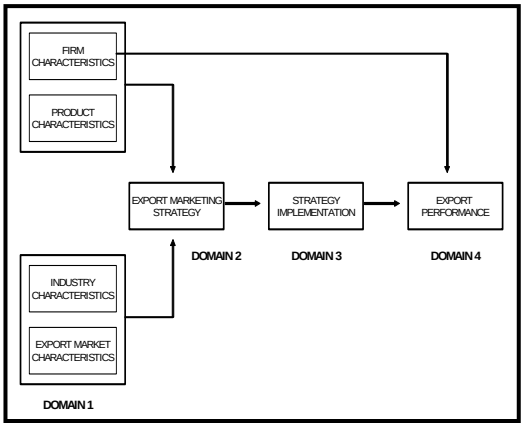
The principle of environment-strategy coalignment (Venkatraman and Prescott, 1990) contends that the "fit" between strategy and its environment, whether external (Anderson and Zeithaml, 1984; Hofer, 1975) or internal (Chandler, 1962; Gupta and Govindarajan, 1984), has significant positive influences on firm performance. Accordingly, the relationships among environment, strategy and performance can be analyzed within the framework of strategic management. This framework sees complementarity between the resource-based and the IO-based theories, hence providing a better explanation of performance. This theoretical underpinning is corollary to that developed by Andrews (1980), which postulates that firms respond to both internal and external environment through strategy and that performance results from the implementation of strategy.

In explaining the logic behind the integration of these theoretical viewpoints, it is necessary to examine the fundamental relationships among the relevant variables. The resource-based view contends that performance is determined by the internal organizational resources. These organizational characteristics constrain strategic choice and the capability of the organization to effectively implement strategy. On the other hand, the IO-based model argues that it is the external environment which directly influences strategy, which in turn impacts performance. Integrating these two views, it follows that performance is attributed to both internal and external factors, and strategy. Moreover, the formulation of strategy is constrained by factors internal and external to the firm. Furthermore, the impact of strategy on performance depends on how effectively it is implemented. Thus, implementation mediates the links of environment and strategy to performance.

3. Conceptual Framework

The conceptual model is founded on the integration of the IO-based and resource-based theories analyzed within the framework of strategic management. It recognizes the critical role of implementation in determining export performance (Figure I).

Figure I. Conceptual Model



The model adapts the basic features of Cavusgil and Zou's (1994) study. First, the individual product-market export venture (EPMV) is considered instead of the firm's total export operation. A product-market venture is defined as the marketing of a single product to a single market. A product sold in two markets or two products sold in a single market are considered two product-market ventures. This approach attempts to avoid problems arising from firm-level studies. A single strategy may not produce the same results for all product-market ventures since strategy and performance variations occur across various export ventures of the firm (Douglas and Wind, 1987). Therefore, firm-level evaluation would most likely produce confounded results (Madsen, 1987). Second, strategic and economic considerations of export performance are measured objectively (i.e., sales, profits) and subjectively (manager's perception of the extent of attainment of objectives). This is in consideration of the multi-faceted nature of export performance. Third, in response to the globalization of markets, export marketing strategy is evaluated considering the standardization-adaptation

continuum (Ryans, Griffith and White, 2003; Cavusgil and Zou, 1994).

4. Key Constructs of the Model

DOMAIN 1 - ENVIRONMENT

Firm and Product Characteristics

The firm's resource profile is a key determinant in the choice of marketing strategy and the ability to implement it (Aaker, 1988). Several studies on export behavior and export success indicated the relevant characteristics as follows: firm size (Moen, 2000; Bonaccorsi, 1992; Burton and Schlegelmilch, 1987; Miesenboch, 1988); international experience (Cavusgil and Zou, 1994; Das, 1994); extent of international business involvement and resources available for export development (Cavusgil and Zou, 1994; Terpstra, 1987); and managerial commitment (Cavusgil and Zou, 1994; Gronhaug and Lorenzen, 1982). This research used the following constructs: international competence (number of export staff, export experience, financial commitment), commitment to export (management commitment, international business intensity, number of countries sold to), experience with product, product uniqueness, product acceptability in the export market and market familiarity with product.

Industry and Market Characteristics

Studies on factors external to the firm show a strong relationship between performance and industry structure and technology intensiveness (Madsen, 1987). Other external factors relate to market characteristics such as trade barriers, export market attractiveness and export market competitiveness. This study included technology intensiveness and regulatory and non-tariff barriers in the importing country.

DOMAIN 2 – EXPORT MARKETING STRATEGY

A critical consideration in export marketing is whether to standardize or adapt the marketing strategy to the target market (Douglas and Craig, 1989). However, the decision on standardization of strategy is not a dichotomous one (complete standardization or complete customization), but rather one of degree of standardization or customization (Quelch and Hoff, 1986). Thus marketing strategy is evaluated using the standardization-adaptation continuum (Cavusgil, Zou and Naidu, 1993).

DOMAIN 3 - STRATEGY IMPLEMENTATION

The Thompson and Strickland (1987) model, which postulates that the essence of successful implementation is the "fit" between strategy and organizational support processes, includes all the variables common in the literature (Alexander, 1991). In view of recent contributions to the literature and new developments in management practices, Thompson and Strickland (1996) expanded the model to include best practices and isolated policies and procedures from support systems. The new model is structured within an eight-task framework and this research grouped the strategy implementation variables into two categories: managerial (organization, leadership and culture) and operational (administrative support, rewards, best practice and budget).

DOMAIN 4 - EXPORT PERFORMANCE

In addressing the multidimensionality of performance, objective (export sales, contribution to total sales and total exports, export growth) and subjective (manager's perception of the EPMV's achievement of important strategic objectives, its profitability and overall success) measures were used.

5. Operational Model and Research Proposition

The integrated strategic model based on the conceptual framework looks into the links between the four domains of the research. The main proposition of the thesis is that strategy implementation mediates the relationships among export strategy, the firm's internal

and external environment and export performance. However, the firm derives its sustainable competitive advantage from its key assets and skills. In export marketing, the relevant assets and skills are international experience (Douglas and Craig, 1989), extent of international business involvement, resources available for export development (Terpstra, 1987) and size advantages (Reid, 1982). These assets and skills enable the firm to identify the peculiarities in the export market, then formulate and execute an appropriate marketing strategy. Therefore firm characteristics directly affect export performance.

The following are the hypotheses tested:

Firm characteristics (firm's international competence, commitment to the export venture, managerial implementation tasks and operational implementation tasks) have significant and positive direct relationships with the following export performance measures:

H1 export sales;
H2 export growth;
H3 contribution to total sales;
H4 contribution to total exports; and
H5 perceived performance.

Managerial and operational implementation tasks mediate the relationship between export performance measures (export sales, export growth, contribution to total sales, contribution to total exports and perceived export performance) and the following export strategies:

H6 product adaptation;
H7 promotion adaptation;
H8 adaptation of distribution support; and
H9 price adaptation

6. Research Method

Data Collection and Key Informants

The sampling frame was drawn from the directory of Philippine exporters. A structured questionnaire was used for the personal interviews with export managers or persons directly involved in the firm's export operations. The majority (37%) of the firms belong to the gifts, toys and housewares industry. The second largest (32%) respondent group manufactured agricultural and horticultural products. The smallest group in the sample exported electronics, footwear and industrial products. The sample consists mostly of small firms (64%) and large firms (13%). Medium-sized firms consist of 9% the sample, while the rest are micro-size and cottage-size firms.

Analytical Procedure

Data entry and analysis were carried out using SPSS for Windows. Preliminary exploration of the data was carried out using the Frequencies Procedure and Multiple Regression and Correlational Analyses (MRC). A limitation of MRC is it can only examine a single relationship at a time (Hair, et. al., 1998). In order to simultaneously investigate a series of dependence relationships, a comprehensive approach called Structural Equation Modeling (SEM) was employed. SEM, an extension of several multivariate techniques is particularly useful when a dependent variable becomes an independent variable in subsequent dependence relationships. Graphical representation of the proposed models and model estimation were performed using AMOS, which has gained increased popularity due to its simple user interface. It has been compared to LISREL and EQS (Hox, 1995).

Goodness-of-Fit Measures for SEM

Since the existing fit indices were developed based on different theoretical grounds and there does not seem to be a single index that can be considered ideal, a variety of goodness-of-fit (GOF) measures were used in combination to evaluate the results from three perspectives: overall fit, comparative fit to a base model, and model parsimony. Although there is no absolute test to determine the acceptable levels of fit, some guidelines have been suggested (Fan and Wang, 1998; Hair, et al.,

1998; Schumacker and Lomax, 1996; Tucker and Lewis, 1973).

Operationalization of Constructs

Multi-item measures for the various constructs were developed guided by the procedure suggested by Churchill (1979). Existing scales identified through the literature review were modified to suit the research purpose and methodology. Where there were no existing scales, new measures were developed based on findings from related studies and depth interviews. The scales used by Cavusgil and Zou (1994) for measuring firm, product, industry and export characteristics, export marketing strategy and export performance were modified while measures for strategy implementation were developed. Measurement items ranged from two to six.

The coefficient alphas for the different constructs were computed (Table I). Items that did not exhibit strong item correlations were deleted. Theoretical arguments support the iterative process of computing the coefficient alphas, removing low correlating items, and recalculating alpha until an acceptable coefficient is achieved. A positive α value is the first indication that the reliability model holds. This means that the items correlate positively with each other because to a certain extent, they are measuring a common entity. The values obtained are acceptable, ranging from 0.5100 to 0.9270 (Nunnally, 1967). The majority of constructs registered alpha values greater than 0.7.

Factor analysis was used to conceptualize clusters of variables and determine which variables belong to which groups. Exploratory factor analysis (EFA) was employed to discover a feasible factor structure in a set of items while confirmatory factor analysis (CFA) was used to simplify, refine and confirm this structure.

The varimax orthogonal rotation was employed to simplify the factor matrix and facilitate interpretation. The orthogonal rotation approach is more widely used not only because it is contained in most computer packages with factor analysis, but also because the analytical procedures relating to oblique rotations are not as well developed, hence subject to considerable controversy (Hair, et. al., 1998).

Table I. Coefficient Alpha for the Multi-Item Constructs

Construct	Item/Factor (Items deleted are marked with *)	Cronbach's Alpha
Firm Characteristics		
International competence (INTLCOMP)	Full-time firm staff Years of firm's involvement in IB Years of export staff experience Capital for export development	.5872
Commitment to export venture (COMMITME)	Full-time export staff Extent of managerial export commitment International business intensity Countries sold to	.5100
Product Characteristics		
Firm's experience with product (PRODEXPE)	Years sold locally Years sold in the export market	.7661
Product uniqueness (PRODUNIQ)	Extent of product differentiation Extent of process exclusivity Strength of patent Variety of uses*	.5304
Cultural acceptability (CULTACCE)	Product's compatibility with export conditions Product's acceptance in the export market	.5089
Export market attractiveness		
Extent of legal/regulatory barriers (BARRIERS)	Extent of regulatory barriers Extent of non-tariff barriers Length of credit terms*	.8398
Export customers' product/ brand familiarity (FAMILIAR)	Product familiarity Brand familiarity	.5310

Strategy		
Product adaptation (PRODUCT)	Initial product adaptation	.7624
	Subsequent product adaptation	
	Labeling in local language	
	Adaptation of packaging	
Promotion adaptation (PROMO)	Adaptation of promotional approach	.8192
	Adaptation of product positioning	
	Adaptation of packaging*	
Price competitiveness (PRICE)	Price competitiveness*	.7372
	Production cost competitiveness	
	Delivery cost competitiveness	
Support to foreign distributor/ subsidiary (DISTSUPP)	Overall support to foreign distributor	.7672
	Training support to foreign distributor	
	Promotion support to foreign distributor	

Table I … continuation

Construct	Item/Factor (Items deleted are marked with *)	Cronbach's Alpha
Strategy Implementation		
Organization (ORGANIZE)	Skills/competency development	.7649
	Talent-base strategy match	
	Identification of critical activities	
	Degree of organicity	
Budget (BUDGET)	Budget adequacy	.7408
	Budget re-allocation flexibility	
	Management's involvement in budgeting	
Administrative Support (ADMINSUP)	Policies and procedures	.8329
	Early detection of need for adjustment	
	Two-way information	
Leadership (LEADER)	Vigilance of competitors' moves	.7611
	Management's conviction that strategy is right and is top priority	
	Balance in power bases	
	Management's active role in plan execution	
	Encouragement of new ideas and creativity*	
Culture (CULTURE)	Incorporation or corporate values/ethics into training	.8496
	Emphasis on achievement and excellence	
	Reasonable/clear performance targets	
	Dignity and respect for employee	
Rewards (REWARDS)	Work assignments-performance targets link	.8260
	Performance targets-strategic plans link	
	Doable performance targets	
Best Practice (BESTPRAC)	Constant task/activity improvement	.9270
	Identification of activities and targets	
	Prevalence of enthusiasm and commitment	
Managerial Tasks (MANAGERI)	Culture	.7468
	Leader	
	Organize	
Operational Tasks (OPERATIO)	Budget	.7757
	Rewards	
	Administrative Support	
	Best Practice	
Export Performance		
Subjective Measures (SUBJPERF)	Overall success	.6175
	Profitability	
	Achievement of important objectives	

7. Results and Discussion

Initial Path Model

To minimize model complexity, measurement items for each construct were summed up such that each construct was measured with only two indicators. Each of these indicators represents a composite of multiple items. This technique exemplifies an intermediate level of analysis between the total scale approach and the total aggregation of items (Abe, Bagozzi and Sadarangani, 1996; Bagozzi and Heatherton, 1994). Since the coefficient alpha for each construct has already been determined and found satisfactory the random aggregation of items does not compromise the reliability of the measurement items.

The 7 strategy implementation variables were grouped into 2 major categories: managerial (MANAGERI) and operational (OPERATIO). The managerial tasks include organization, leadership and culture while the operational tasks are comprised of administrative support, rewards, best practice and budget. The 3 perceived measures of export performance were summed up into a composite called subjective performance (SUBJPERF). Export sales (EXPORTS), export growth (SALESGROW), contribution to total sales (SALTOTOT) and contribution to total exports (SALTOEXP) represent the objective performance measures.

A very large and highly significant x^2 value suggests that the actual input matrix is significantly different from the predicted input matrix (

Table II).

The poor fit of the data to the hypothesized model is evident in the GFI and AGFI which are both less than 0.90. The values of the incremental fit indices are far below 0.90. The hypothesized model rates very poorly with respect to the independence model. With the exception of AIC which suggests a better parsimony relative to the independence model, all the fit indices indicate a poor model fit. Hence the hypothesized model was re-specified.

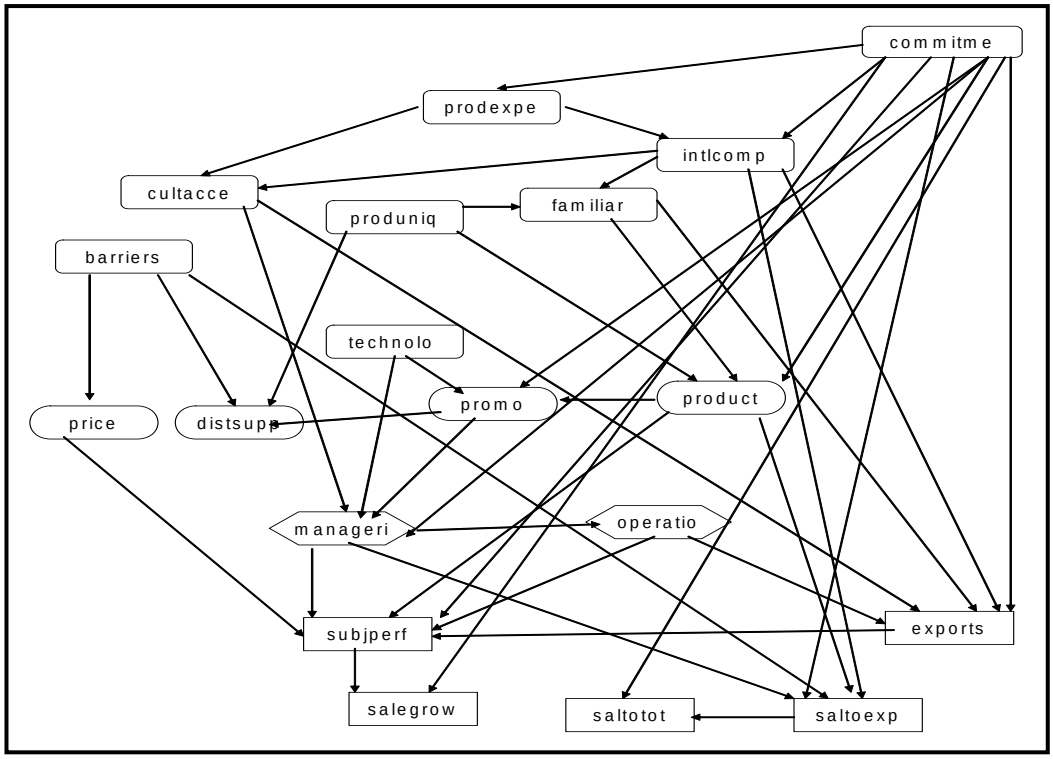
Table II . Goodness of Fit Indices for the Initial and Final Path Model (Integrated Strategic Management Model)

GOF CRITERION	Acceptable Level	Initial Model Estimates	Final Model Estimates	Interpretation (Final Model)
Model Fit				
x2 value	Low x2 value (relative to degrees of freedom (df) with significance level > 0.05 or > 0.01	508.730 df = 120 p = 0.000	142.782 df = 125 p = 0.132	The x2 value is small and not significant, very good fit
Cmin/df	Ratio of 2:1 or 3:1	4.239	1.142	Very good fit, <2 Good fit, > 0.90
Goodness-of-fit index (GFI)	Very close to 0.90	0.804	0.928	Adequate fit, = 0.90
Adjusted GFI (AGFI)	Very close to 0.90 (adjusted for df)	0.689	0.900	Very good fit, > 0.05
RMSEA	< 0.10	0.132	0.028	
Model Comparison				
Tucker-Lewis Index (TLI)	Value close to 1	0.400	0.974	Almost perfect fit, very close to 1
Normed Fit Index (NFI)	Value close to 0.90	0.535	0.870	Poor fit, < 0.90
Comparative Fit Index (CFI)	Value close to 1	0.579	0.981	Almost perfect fit, very close to 1
Model Parsimony				
Parsimonious Fit Index (Pclose)	Value close to 1	0.000 vs. 0.000 - independence model	0.974	Close fit, close to 1
Akaike Information Criterion (AIC)	Value close to 1	648.730 vs. 1131.797 – independence model	272.782	Good fit, smaller value relative to independence model

Final Path Model

The vertical orientation of the diagram (Figure II) emphasizes the hierarchical structure of the model. Various shapes represent the variables belonging to the 4 domains. The hierarchy shows the interrelationships between the variables within the same domain and the importance of each variable relative to the others within the domain. Ideally, variables in one domain should be aligned with each other to delineate them from the others belonging to the other domains. However, the shapes were repositioned to clearly show the links between the variables belonging to different domains and minimize lines crossing the shapes and other lines. The repositioning resulted in a less cluttered path model.

Figure II. Final Path Model (Integrated Strategic Management Model)



The fit indices for the final model are better than those for the initial model (

Table II).

The NFI value, though, can be improved. It is however, better (closer to 0.90) than that of the initial model. Model parsimony relative to the independence and initial models is better as indicated by the smaller AIC. The highest modification index showed a fairly low probability of improving the model with any modification. Hence, the re-specified model is accepted as the final model.

Determinants of Export Sales

International competence, commitment to the export venture, cultural acceptability of the product and export customers' product/brand familiarity have positive direct relationships with export sales (Table III). The operational implementation tasks have a direct and

negative influence on export sales. This negative influence may have resulted from over commitment of resources by firms which substantially invested in equipment necessary to streamline production, training of personnel, re-structuring the operational budgets and reward systems of the export units while at the same time maintaining a relatively low export growth. These measures were undertaken by firms in the three years prior to the research study to improve and maintain the high quality of their exports. It is within this period that the government adopted export development as a national economic strategy. Philippine exporters, the majority of which are small- and medium-size enterprises, took advantage of the government's support for importing essential production inputs (mostly equipment) and developing human resources through training of management, design engineering and product testing. Taking advantage of such government incentives involved substantial time and effort on the part of the exporters. To comply with eligibility requirements, they had to submit various papers regarding company profile and financial standing, attend seminars and workshops and accommodate plant visits by financial assessors. Such activities may have diverted their attention from their export activities and negatively influenced export sales in the short-term.

Table III. Direct, Indirect and Total Effects on Export Sales

Variables	Coefficients and Significance		
	Direct Effects	Indirect Effects	Total Effects
International competence	1.024***	0.157**	1.181***
Commitment to venture	0.575***	0.038	0.613**
Product uniqueness	none	0.042*	0.042*
Experience with the product	none	0.340**	0.340**
Cultural acceptability of the product	0.350*	-0.071	0.279*
Technology intensiveness	none	-0.043*	-0.043*
Product/brand familiarity	0.305*	-0.007	0.298*
Product adaptation	none	-0.024*	-0.024*
Promotion adaptation	none	-0.045*	-0.045*
Managerial implementation tasks	none	-0.447*	-0.447*
Operational implementation tasks	-0.451*	none	-0.451*

*** $p<0.001$; ** $p<0.01$; * $p<0.05$; † $p<0.1$

While directly influencing export sales, commitment to the export venture, international competence, cultural acceptability of the product and export customers' product/brand familiarity also influence this performance measure positively and indirectly. The indirect effects of commitment to the export venture on export sales are through international competence, product and promotion adaptation and managerial and operational implementation tasks. Commitment to the export venture enhances the firm's international competence. A competent firm can discern the subtleties in the export market and is able to align its marketing strategies to enhance product viability. Competence also enhances the judicious execution of these marketing strategies. International competence impacts export sales through export customers' product/brand familiarity, cultural acceptability of the product, managerial and operational implementation tasks. Export customers' product/brand familiarity influences export sales through its impact on product and promotion adaptation and managerial and operational implementation tasks. The positive relationship between export customers' product/brand familiarity and product and promotion adaptation may reflect the export customers' product/brand familiarity at the time of the survey. This familiarity may have resulted from product/promotion adaptation in the past. The positive relationship between strategy adaptation and the extent of execution of key implementation tasks implies that the adaptation of export marketing strategy propels the firm to more judicious allocation of its resources, more meticulous planning and execution of critical activities and more emphasis on excellence and achievement through managerial example.

Product uniqueness, experience with the product, technology intensiveness, product and promotion adaptation and managerial implementation tasks indirectly influence export sales through export strategy and/or strategy implementation (Figure II). Notably, the managerial implementation tasks influence export sales through their impact on the operational implementation tasks. The significant direct positive relationship of the managerial factors with the operational tasks indicates the relevance of managerial aspects in effecting export success. This points to the fact that management has a direct responsibility in strategic choices (Miesenbock, 1988).

Export growth is directly and positively influenced by commitment to the export venture and perceived performance (Table IV). Commitment to the export venture also indirectly and positively influences export growth through the export strategy adapted by the firm (product and promotion adaptation), strategy implementation (managerial and operational tasks) and perceived performance (Figure II). This implies that the firm's high commitment to the export venture is translated into strategies and organizational processes that enhance the product's viability in the export market. This in turn generates a favorable perception among managers regarding achievement of important strategic objectives, export profitability and overall success.

Determinants of Export Growth

Table IV. Direct, Indirect and Total Effects on Export Growth

Variables	Coefficients and Significance		
	Direct Effects	Indirect Effects	Total Effects
International competence	none	0.044*	0.044*
Commitment to venture	0.525**	0.133**.	0.658**
Product uniqueness	none	0.018*	0.018*
Experience with the product	none	0.003	0.003
Cultural acceptability of the product	none	0.045*	0.045*
Technology intensiveness	none	0.021*	0.021*
Product/brand familiarity	none	0.023*	0.023*
Regulatory/non-tariff barriers	none	0.004 †	0.004 †
Product adaptation	none	0.052*	0.052*
Promotion adaptation	none	0.022*	0.022*
Price competitiveness	none	0.041 †	0.041 †
Managerial implementation tasks	none	0.220*	0.220*
Operational implementation tasks	none	0.114*	0.114*
Perceived performance	0.442*	none	0.442**
Export sales	none	0.026*	0.026*

*** $p<0.001$; ** $p<0.01$; * $p<0.05$; † $p<0.1$

Determinants of Contribution to Total Exports

The variables with a significant direct relationship with contribution to total exports are international competence, commitment to the export venture, regulatory/non-tariff barriers, product adaptation, managerial implementation tasks and export sales (Table V). While positively related to contribution to total exports, international competence is also influencing this measure of export performance through its impact on export customers' product/brand familiarity, product and promotion adaptation, managerial and operational implementation tasks and export sales. Commitment to the export venture also influences contribution to total exports indirectly through product adaptation, managerial and operational implementation tasks and export sales (Figure II). The influence of cultural acceptability of the product on contribution to total exports is through its impact on managerial and operational implementation tasks and export sales. Product uniqueness is linked to contribution to total exports by product and promotion adaptation, managerial and operational implementation tasks and export sales. Product and promotion adaptation, through their impacts on managerial and operational

implementation tasks and export sales, influence contribution to total exports.

Table V. Direct, Indirect and Total Effects on Contribution to Total Exports

Variables	Coefficients and Significance		
	Direct Effects	Indirect Effects	Total Effects
International competence	0.570***	-0.594***	-0.024
Commitment to venture	0.346*	0.379***.	0.725**
Product uniqueness	none	-0.056 †	-0.056 †
Experience with the product	none	-0.036	-0.036
Cultural acceptability of the product	none	0.195**	0.195**
Technology intensiveness	none	0.019	0.019
Product/brand familiarity	none	0.073	0.073
Regulatory/non-tariff barriers	0.257***	none	0.257***
Product adaptation	-0.253**	0.010	-0.243**
Promotion adaptation	none	0.020	0.020
Managerial implementation tasks	0.408**	-0.208***	0.200
Operational implementation tasks	none	-0.211**	-0.211**
Export sales	0.466***	none	0.466***

*** $p<0.001$; ** $p<0.01$; * $p<0.05$; † $p<0.1$

Determinants of Contribution to Total Sales

Contribution to total sales is directly and positively related to commitment to the export venture and contribution to total exports (Table VI). Commitment to the export venture also positively influences contribution to total sales through its impact on product and promotion adaptation, managerial implementation tasks and contribution to total exports (Figure II).

Table VI. Direct, Indirect and Total Effects on Contribution to Total Sales

Variables	Coefficients and Significance		
	Direct Effects	Indirect Effects	Total Effects
International competence	none	-0.018	-0.018
Commitment to venture	0.682***	0.523***.	1.205***
Product uniqueness	none	-0.040 †	-0.040 †
Experience with the product	none	-0.026	-0.026
Cultural acceptability of the product	none	0.141**	0.141*
Technology intensiveness	none	0.014	0.014
Product/brand familiarity	none	0.053	0.053†
Regulatory/non-tariff barriers	none	0.185**	0.185**
Product adaptation	none	-0.175**	-0.175**
Promotion adaptation	none	0.015	0.015
Managerial implementation tasks	none	0.144	0.144*
Operational implementation tasks	none	-0.152**	-0.152*
Export sales	none	0.336**	0.336***
Contribution to total exports	0.721***	none	0.721***

*** $p<0.001$; ** $p<0.01$; * $p<0.05$; † $p<0.1$

Determinants of Perceived Export Performance

The perceived measure of export performance is directly and positively influenced by commitment to the export venture, price and product adaptation, managerial and operational implementation tasks and export sales (Figure II). The perception of managers of the profitability of the export venture, degree of achievement of important strategic objectives and overall success is higher when commitment to the export venture is high, when the price and product elements are adapted and when there is a high degree of accomplishment of the key implementation tasks and when export sales are high. While directly influencing perceived performance, the

operational implementation tasks indirectly influence this performance measure through their impact on export sales.

Strategy variables (product and promotion adaptation) influence perceived performance indirectly through their impact on managerial and operational implementation tasks. Environmental factors indirectly influence perceived performance through export strategy and/or strategy implementation.

Table VII presents the summary assessment of the hypotheses.

8. Conclusion

This study has attempted to reconcile the competing explanations for export performance by positing that strategy implementation mediates the links among the firm's internal and external environment, export marketing strategy and export performance. From the standpoint of theory development, this research adds to the stream of inquiry on international marketing, specifically, strategic management, which has addressed strategy implementation issues. The field of international marketing has become increasingly challenging to strategic management scholars because it has evolved into a broader, more diverse theoretical base as a result of cross-disciplinary fertilization. Because of these developments, this research has taken on the challenge of retaining and building on the solid theory grounding which has been achieved in the past while expanding the domain and viewpoint to create an even more integrative, unifying and managerially relevant discipline. Being theoretically rooted on the integration of the IO-based and resource-based theories analyzed within the framework of strategic management, the research approach enriches the context at which relevant factors are examined, encourages the integration of disciplines and evokes tolerance for methodological diversity.

The application of structural equation modeling has enabled the detection of a hierarchical structure in the conceptual model for strategic management. The use of this second generation analytical technique has allowed for a more integrative investigation of the determinants of export performance, thus overcoming the fragmented findings from the use of other simplistic analytical tools. Furthermore, SEM has allowed for the assessment of reliability and validity of construct measurement; hence, its application has contributed to the rigor of developing multi-item measures for various constructs used in this study. The verification of the reliability and validity of the multi-scale items used in measuring the key constructs in this research allows for such constructs to be used in future studies.

Paramount to achieving success in the export venture are managerial and resource commitment, the accumulation of knowledge and skills in international business, judicious execution of the managerial and operational implementation tasks, product adaptation and price competitiveness. This key finding points to the relevance of the firm's internal environment to export performance.

Commitment to the export venture directly influences the firm's international competence and experience with the product, product and promotion adaptation and managerial implementation tasks indicating its important role in determining the strategic choices of the firm. Moreover, the direct influence of commitment to the export venture to all measures of export performance highlights its critical role in strategic management.

The role of strategy implementation is central in determining export performance. Product and promotion adaptation influence export sales, export growth and perceived performance through managerial and operational implementation tasks. While commitment to the export venture, international competence, export customers' product/brand familiarity and cultural acceptability of the product directly affect export performance, they also exert some influence (indirect effect) on these performance measures through managerial and operational implementation tasks. Product adaptation, while directly related to contribution to export sales, is influencing it indirectly through its impact on promotion adaptation and managerial implementation tasks. Both managerial and operational implementation tasks directly and positively influence

the perception of managers regarding export performance. However, the managerial tasks influence export sales through the operational tasks. Export growth is positively and indirectly linked to strategy implementation through managers' perception of export performance.

The significant positive and direct influence of managerial implementation tasks on the operational tasks point to the crucial role of the managerial factors in propelling the accomplishment of the operational tasks leading to the success of a firm's export performance.

The managers' perception of achievement of important strategic objectives, export venture profitability and overall success is directly and positively affected by export sales. This finding attests to the relative importance of export sales as a measure of export performance with respect to the other measures.

9. Managerial Implications and Applications

Irrespective of performance dimension, commitment to the export venture came out as a major determinant of export performance. The implication of the overall importance of commitment to the export venture is straightforward. Substantial management commitment enables a firm to vigorously pursue opportunities in the export market through effective marketing strategies that lead to better export performance. The rationale must be sought in the fact that the formulation of export strategy is largely influenced by managerial experience developed over time. Extensive business experience brings about a better understanding of market mechanisms and business networks, consequently improving decisions about marketing elements which eventually enhances performance outcomes. Moreover, the support for a strategy is largely dependent on the extent of commitment management has for the venture.

Though product adaptation emerged as a key determinant of export performance, managers would gain by keeping in mind the contingent nature of strategy formulation as conditions in the environment, thus, consumer behavior vary over time. It is also important to keep in mind that the findings of this research reflect practices of mostly small export firms from a developing country, largely selling consumer products.

The findings that substantiate the mediating role of strategy implementation on the export strategy-export performance relationship underscore the relative importance of the role of strategy implementers. Strategies per se, do not enhance performance. Their impact on performance partly rests on how effectively they are implemented.

Table VII. Summary Assessment of Hypotheses

Hypothesis: There is a significant direct and positive relationship between export strategy and firm characteristics.

Export Performance Measures	Firm Variables			
	Firm's international competence	Commitment to the export venture	Managerial implementation tasks	Operational implementation tasks
(H1) Export sales	supported	supported	not supported	not supported
(H2) Export growth	not supported	supported	not supported	not supported
(H3) Contribution to total sales	not supported	supported	not supported	not supported
(H4) Contribution to total exports				
(H5) Perceived performance	supported	supported	supported	not supported
	not supported	supported	supported	supported

Hypothesis: Managerial and operational implementation tasks mediate the relationship between export strategy and export performance measures.

Export Performance Measures	Export Strategy			
	Product adaptation (H6)	Promotion adaptation (H7)	Adaptation of distribution support (H8)	Price adaptation (H9)

Export sales	supported	supported	not supported	not supported
Export growth	supported	supported	not supported	supported
Contribution to total sales	supported	not supported	not supported	not supported
Contribution to total exports	not supported	not supported	not supported	not supported
Perceived performance	not supported	supported	not supported	not supported

References

Aaker, D. A. (1988). *Strategic market management*. New York: John Wiley & Sons.

Abe, S., Bagozzi, R. P., & Sadarangani, P. (1996). An investigation of construct validity and generalizability of the self-concept: Self consciousness in Japan and the United States. *Journal of International Consumer Marketing*, *8* (3-4), 97-123.

Alexander, L. D. (1991). Strategy implementation: nature of the problem. *International Review of Strategic Management*, *2*, 73-91.

Anderson, C., & Zeithaml, C. P. (1984). Stage of the product life cycle, business strategy and business performance. *Academy of Management Journal*, *27*, 5-24.

Andrews, K. R. (1980). *The concept of corporate strategy*. Illinois: Irwin.

Bagozzi, R. P., & Heatherton, T. F. (1994). A general approach to representing multifaceted personality constructs: applications to state self-esteem. *Structural Equation Modelling*, *1*, 35-67.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, *17*, 99-120.

Bonaccorsi, A. (1992). On the relationship between firm size and export intensity. *Journal of International Business Studies*, *4th Quarter*, 605-635.

Burton, F. M., & Schlegelmilch, B. B. (1987). Profile analysis of non-exporters versus exporters grouped by export involvement. *Management International Review*, *27* (1), 38-49.

Cavusgil, S. T., & Zou, S. (1994). Marketing strategy-performance relationship: an investigation of the empirical link in export market ventures. *Journal of Marketing*, *58*, 1-21.

Cavusgil, S. T., Zou, S., & Naidu, G. M. (1993). Product and promotion adaptation in export ventures: an empirical investigation. *Journal of International Business Studies, 3rd Quarter,* 479-506.

Chandler, A. D. (1962). *Strategy and Structure*. Massachusetts: MIT Press.

Churchill, J. (1979). A paradigm for developing better measures of marketing constructs. *Journal of Marketing Research, 16*, 64-73.

Collis, D. J. (1991). A resource-based analysis of global competition: the case of the bearings industry. *Strategic Management Journal, 12*, 49-68.

Das, M. (1994). Successful and unsuccessful exporters from developing countries some preliminary findings. *European Journal of Marketing, 28* (12), 19-33.

Donthu, N., & Kim, S. H. (1993). Implications of firm controllable factors on export growth. *Journal of Global Marketing, 7* (1), 47-63.

Douglas, S. P., & Wind, Y. (1987). The myth of globalization. *Columbia Journal of World Business, (Winter),* 19-29.

Douglas, S. P., & Craig, C. S. (1989). Evolution of global marketing strategy: scale, scope and synergy. *Columbia Journal of World Business*, *Fall*, 47-58.

Fan, X., & Wang, L. (1998). Effects of potential confounding factors on fit indices and parameter estimates for true and misspecified SEM models. *Educational and Psychological Measurement, 58* (5), 701-735.

Gronhaug, K., & Lorenzen, T. (1982). Exploring industrial export strategies an assessment of marketing thought and practice. *American Marketing Association Proceedings, 48*, 294-298.

Gupta, A. K., & Govindarajan, V. (1984). Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. *Academy of Management Journal*, *27* (1), 25-41.

Hair, J. F. J, Anderson, R. E., Tatham, R. L., & Black, W. C. (1998). *Multivariate data analysis*. New Jersey: Prentice-Hall.

Hofer, C. W. (1975). Toward a contingency theory of business strategy. *Academy of Management Journal, 18*, 748-810.

Hox, J. J. (1995). Amos, EQS, and Lisrel for Windows: a comparative review. *Structural Equation Modeling, 2*, (1), 79-91.

Katsikeas, C. S., Leonidou, L. C., & Morgan, N. A. (2000). Firm-level export performance assessment: review, evaluation and development. *Journal of the Academy of Marketing Science, 28* (4), 493-511.

Lages, L. F., Jap, S. D., & Griffith, D. A. (2008). The role of past performance in export ventures: a short-term reactive approach. *Journal of International Business Studies, 39*, 304-325.

Madsen, T. K. (1987). Empirical export performance studies: a review of conceptualizations and findings. In S. T. Cavusgil (ed.), *Advances in International Marketing* (pp. 177-198). London: Jai Press.

Miesenbock, k. J. (1988). Small business and exporting: a literature review. *International Small Business Journal, 6* (2), 42-61.

Moen, O. (2000). SMEs and international marketing: investigating the differences in export strategy between firms of different size. *Journal of Global Marketing, 13* (4), 7-28.

Nunnally, J. C. (1967). *Psychometric methods*. New York: McGraw-Hill.

Quelch, J. A., & Hoff, E. J. (1986). Customizing global marketing. *Harvard Business Review, 64* (May-June), 59-68.

Ryans, Jr., J. K., Griffith, D. A., & White, D. S. (2003). Standardization/adaptation of international marketing strategy: necessary conditions for the advancement of knowledge. *International Marketing Review, 20* (6), 588-603.

Reid, S. D. (1982). The impact of size on export behavior in small firms. In M. R. Czinkota & G. Tesar G. (eds.) *Export Management: An International Context* (pp. 18-37). Praeger: Special Studies.

Reid, S. D. (1986). *Is technology linked with export performance in small firms?* The Art and Science of Innovation Management, Amsterdam: Elsevier Science Publishers.

Scherer, F. M., & Ross, D. (1990). *Industrial market structure and economic performance*. Chicago: Rand Mcnally.

Schumacker, R. E., & Lomax, R. G. (1996). *A beginner's guide to structural equation modeling*. New Jersey: Lawrence Eribaum Associates, Inc.

Terpstra, V. (1987). The evolution of international marketing. *International Marketing Review*, *Summer*, 47-59.

Thompson, A. J., & Strickland, A. J. (1987). *Strategic management concepts and cases*. Texas: Business Publications.

Thompson, A. J., & Strickland, A. J. (1996). *Strategic management concepts and cases*. USA: Irwin/McGraw-Hill.

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, 381-410.

Venkatraman, N., & Prescott, J. E. (1990). Environment-strategy coalignment: an empirical test of its performance implications. *Strategic Management Journal*, 111-123.

Wernerfelt, B. (1984). A resource-based view of the firm. *Strategic Management Journal, 52* (2), 171-180.

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A Comparative Study of Consumer Attitudes and Intentions to Use RFID Technologies in the U.S. and Europe Hotel Industry

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ABSTRACT

The purpose of this study is to compare the attitudes towards RFID technologies, and the intentions to use RFID technologies, among hotel consumers in the U.S. and Europe. This research implemented web-survey methodology for collecting and analyzing the data. The researchers developed a twenty-item instrument quantifying the respondents' beliefs, affective components, usage behavior and the intentions to use RFID technologies in the hotel industry. Regression analysis was used to find the relationships between the variables and independent samples t-test was used to compare the differences between the U.S. and Europe consumers. Among both the U.S. and European consumers, the affective components were significantly related to attitudes. However, beliefs were only significantly related to attitude among the U.S. consumers.

1. Introduction

Keeping up with technologies is a game rampant among organizations these days. RFID (Radio Frequency Identification) technology is one of the latest technologies considered as the "next big thing" for business organizations since it has the potential to change the way companies operate and do business (Wyld, 2006; Curtin et al., 2007 & Smith, 2005). With rapid adoption of new technologies in order to achieve a competitive advantage, organizations in various industries, including hospitality, are increasingly being challenged to consider the viability of these technologies (Erickson & Kelly, 2007; Jones et al., 2005 & Nyheim et al., 2004). RFID technology can bring new developments in the areas of management and operations to "improve speed, accuracy, efficiency and security of information" (Jones et al., 2004). These technologies have a vast potential and interest not only from an educator's perspective but also from the perspective of the business world. RFID technologies considered in this study include kiosk systems, contactless smartcards (wrist band or tags), cashless payment systems, energy management systems, electronic door locks, tracking and security systems, e-safes and in-room purchasing systems, near-field communication systems, asset management systems, and Microsoft Surface technology.

RFID's were first used and implemented for military use in World War II by the British Royal Air Force and later in the 1980's for commercial purposes in the e-toll highway systems in the U.S. and Europe (Spekman &

Sweeney II, 2006; Razzouk et al., 2008 & Rundh, 2007). RFID technologies gained popularity when the U.S. Department of Defense, Boeing and Airbus initiated their usage during the 1950s. From those humble beginnings, RFID technologies had grown to be a $3 billion industry by 2005 and are anticipated to grow to a $25 billion industry by 2015 (Wyld, 2006). Technology is imperative for creating a strategic advantage in the hospitality industry (O'Connor, 1999; Siguaw et al., 2000). If used effectively, RFID technologies may bring a major source of advantage to hospitality organizations. (Nyheim et al., 2004).

In the U.S., and the U.K., many major retailers such as Wal-Mart, Best Buy, Gillette, Tesco, Salisbury, Marks & Spencer, House of Fraser, Selfridges and Woolworths have made plans to implement RFID technologies during the recent years (Jones et al., 2005; Juban & Wyld, 2004 & Wyld, 2006). Other companies like Metro in Germany, Carrefour in France, highway tolls in Italy, Portugal, and Norway have also acknowledged the benefits of using RFID (Jones et al., 2005). Nyheim et al (2004) stated that there is an appreciation towards technology today in the global hospitality industry since it facilitates competitive advantage and an opportunity to achieve the goals of an organization more effectively. In spite of the recent interest in RFID technologies, unlike the Internet technologies, RFID technologies have taken a much longer time to attain maturity (Siguaw et al., 2000, Buhalis & Main, 1998 & Beaver, 1995).

Smith (2005) suggested that any industry that uses RFID technologies will see a return on investment (ROI) in the long run, and is also assured to grow in its industry. Among hospitality organizations, new technology adoption is primarily influenced by consumer awareness and intention to use these technologies (Rogers, 1983; Wang & Qualls, 2007). Consumers play a central role in the introduction and implementation of new technologies in the hotel industry. Davis et al (1989) and Ajzen & Fishbein (1977 and 1980) theorized on the adoption of technology based on reasoned action and consumer attitudes. They have proposed that innovations should be used in organizations only when consumer beliefs and affects result in developing a supportive attitude to use new technologies. The purpose of this study is to compare the attitudes towards RFID technologies, and the intentions to use RFID technologies, among hotel consumers in the U.S. and Europe.

2. Literature Review

2.1. RFID Technology:

RFID is a term used to describe technologies that use radio waves for "identifying and tracking objects automatically" (Jones et al, 2005). The key components of RFID are its "tags, readers and software systems" that can store product data, communicate by sending and receiving signals and also integrate this data and processes to an information system (Lin & Lin, 2007; Smith, 2005 & Rundh, 2007). A challenge with the use of the technology is that consumers may feel threatened by the ability of the technology to trace their behavior. A study conducted on understanding perceptions of German consumers revealed that consumers are more concerned about their privacy (Gunter & Spiekermann, 2005). Jones et al (2005) also studied similar challenges in the use of RFID in the U.K. Consequently, there is an immense need in the hotel industry both in Europe and U.S. to evaluate the intentions of consumers and their intended use of RFID technologies.

In the U.S., technology adoption and use can be divided into two epochs- before 9/11 and after 9/11; since the event has changed the intentions and attitudes of consumers in using any technology due to concerns of privacy and identity theft (Razzouk et al., 2008). One of the recent studies conducted in understanding awareness and attitudes in using RFID among graduate and undergraduate students in the U.S. highlighted the concerns of privacy and security of personal information (Razzouk et al., 2008). In spite of these issues, RFID technologies are being used in highway toll stations and consumers use them as a convenience in their everyday

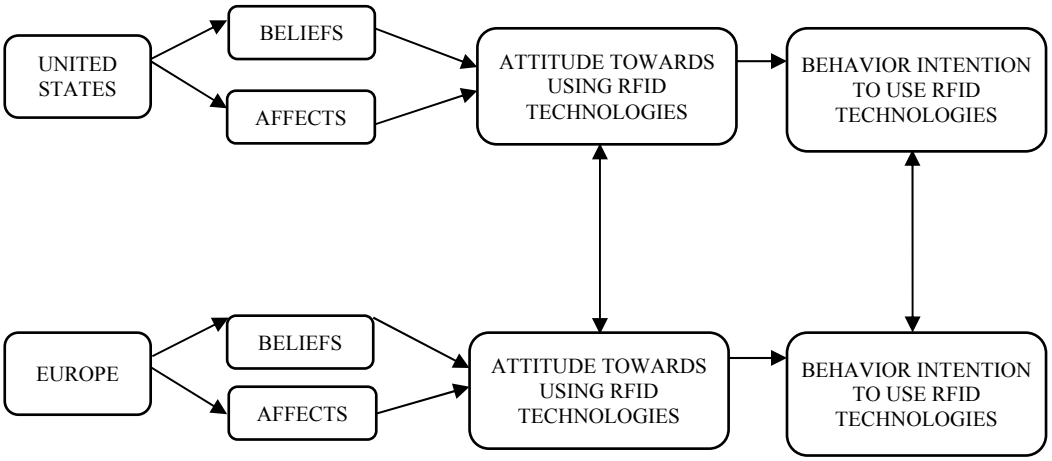
life (Eckfieldt, 2005). However, consumer's intentions and attitudes towards using technologies change with advancing technologies and hence it makes it imperative to study such changes

2.2. Consumer Behavioral Intentions:

The initial theories on technology adoption made by Fishbein and Ajzen (1975) called the Theory of Reasoned Action (TRA) proposed that there are many factors that influence individual behavior such as subjective norms, attitudes, and behavior intentions. The later studies made by Ajzen and Fishbein (1980), Ajzen and Madden (1986), Davis (1989) and Davis et al (1989) on both TRA and Technology Acceptance Model (TAM) identified that the "notion of an individual cognition" results in the use of new technology. These individual cognitions are proposed in a theoretical perspective as "beliefs" of the consumer. These beliefs represent individual intentions to use, given the technology. These individual intentions encompass diverse beliefs to use technology and have a significant impact on the behavior of the consumer.

The studies of TAM and TRA, show that consumers develop a "cognitive processes" within themselves based on information they accumulate over time and this information develops as individual beliefs about that particular technology's acceptance and use (Davis et al., 1989; Ajzen & Fishbein, 1980 & Lewis et al., 2003). All these studies have resulted in a proposed theory that beliefs are formed due to various influences that can be divided into three factors called the "institutional, social and individual". But studies conducted in these areas have not clearly concluded on how various social and institutional factors resulted in shaping individual beliefs (Lewis et al, 2003). This study will consider beliefs of consumers on using RFID technology based on their individual beliefs rather than considering the institutional and social beliefs.

CONCEPTUAL MODEL



Based on TAM and TRA, a conceptual model was developed for this research that identified the relationship between consumer behaviors to use RFID technologies and their attitudes towards the technologies. In the model, both for the U.S. and European consumers, the beliefs and affective components combine to create an attitude towards RFID technologies. In turn, the attitudes of the consumers drive their intentions to use such technologies. The core hypotheses that were tested in this study are described below.

H_1: There is a significant relationship between consumer beliefs and attitudes to use RFID technologies in the U.S.

H_2: There is a significant relationship between consumer beliefs and attitudes to use RFID technologies in the Europe.

H_3: There is a significant relationship between consumer affects and attitudes to use RFID technologies in the U.S.

H_4: There is a significant relationship between consumer affects and attitudes to use RFID technologies in the Europe.

H_5: There is a significant relationship between consumer attitudes and intentions to use RFID technologies in the U.S.

H_6: There is a significant relationship between consumer attitudes and intentions to use RFID technologies in the Europe.

H_7: There is a significant difference between attitudes of consumers to use RFID technologies in the U.S and Europe

H_8: There is a significant difference between intentions of consumers to use RFID technologies in the U.S and Europe.

In most studies conducted in the 1980's on cognition, reasoned action focused on affect or also called on emotion that plays a significant role in the consumer's behavior (Antonides & Raaij, 1998). The consumer develops cognitive structures that signify beliefs where they develop a "collection, processing and synthesizing information" concerning present or new technology (Lewis et al, 2003). The decisions to use technology are considered by affective preferences completely and information processed by beliefs is stimulated with affect (Antonides & Raaij, 1998). Fishbein and Ajzen's studies on reasoned action and attitude theory concluded that, "the evaluations of an alternative characteristic are a form of affect" (Antonides & Raaij, 1998).

Consumers, when provided with great experiences and value added services, are most likely to have a positive feeling towards the hotel or a product. H1 and H2 are influenced by this literature. These experiences collectively influence affects or emotions because these may have quite intense feelings and depend on varied experiences of services or products (Antonides & Raaij, 1998). According to Antonides & Raaij (1998), these positive and negative emotions gradually disappear by leaving a mark in a type of mood and these positive and negative emotions and moods are jointly referred to as "affects". Affects can be considered one of the important factors that can shape the attitude of a consumer to use RFID technology. This affect towards using technology is studied sometimes as cognition and feelings, which results in consumers using a particular technology (Ajzen & Fishbein, 1980; Ajzen & Madden, 1986; Davis, 1989; Davis et al., 1989; Lewis et al., 2003). H2 and H3 are influenced by this research.

Hotel consumers with more innovativeness and likeliness to change are "change agents" that have positive beliefs about using a new technology (Agarwal & Prasad, 1998). The positive beliefs and affects of these consumers may result in shaping the attitude of the consumer to use RFID technology in hotel industry. Ajzen and Fishbein (1980) stated that strength of individual beliefs that will facilitate in using technology is attitude of the consumer. Attitude to use technology can also be identified as "individuals overall affective reaction to using a system" (Venkatesh et al., 2003). Consumer's evaluations based on influences of positive and negative experiences, collectively called affects, lead to an attitude formed by these associations of information processes. By having prior experience or previous information about technology, consumers develop an attitude towards using technology. It is probable that this attitude is "tied fairly strongly" to consumer behavioral intentions to use new technology (Antonides & Raaij, 1998, Venkatesh et al., 2003). It is through associations that a relationship forms between affect and attitude and these associations are basically formed in consumers based on information through advertisements and promotions (Antonides & Raaij, 1998).The attitude towards using RFID technology in the Europe and U.S. hotel industries can be studied based on the affect formed by associating the information provided to the consumers.

Oliver (1998) defines intentions of a consumer as "stated likelihood to engage in a behavior". According to Zanna & Rempel (1988), consumer attitude to use technology may form based on past behavior, affective information or cognitive information. Ajzen and Fishbein (1977) proposed the extent of an attitude will optimally predict the behavior of consumer in some circumstances called "apply to the action, subject of the action, situation and time of the action". Fishbein & Ajzen, (1975); Ajzen(1985) and Antonide & Raaij (1998) acknowledged that "behavior intention is a mediating variable to explanation of behavior" and this intention of the consumer is clarified by his attitude. Ajzen's (1985) study on the normative factors in attitude and behavior relations stated that personal factors such as attitude are primary factors to determine "behavioral intentions" of consumers. Davis et al. (1989) and Juban & Wyld (2004) implied that this attitude to use new technology will provide us with behavioral intentions towards using RFID technologies. The "intentions to use" RFID technology can provide results for understanding the behavior of the consumer in using these technologies in hotel industries both in the U.S. and Europe.

3. Methodology

3.1. Survey Instrument

The methodology used for this study is descriptive and causal research design. This research study used web-survey methodology for collecting and analyzing data. The researchers developed a twenty-item instrument quantifying respondents' beliefs, affective components, and intentions to use RFID technologies in the hotel industry. The instrument also breaks down the use of RFID technologies into ten categories. The instrument was developed based on the Expectancy Theory of motivation used in consumer behavior. A seven- point Likert–type scale from Strongly Disagree (1) to Strongly Agree (7) is used to measure variables rating the beliefs, affects, attitudes and intentions of using RFID Technologies.

The final section contained five questions relating to demographic information of the participants using nominal scales. A reliability analysis to test the reliability and internal consistency of each of 19 variables was performed using Cronbach's alpha. The result for the alpha coefficients for all variables was high, ranging from 0.78 to 0.96. The respondents or target population of the web-survey are frequent hotel guests in the U.S., identified in a commercially available travel database through a tourism research center at a major Midwestern university. The European travelers are identified by commercially available travel resources on the World Wide Web.

3.2. Sampling Plan

The study created a list of email addresses by selecting a target population of frequent travelers from the traveler's database by using simple random probability sampling in the U.S. In Europe, the convenience non-probability sampling method is used by selecting the frequent travelers from travel resources. The survey is implemented during the months of April and May 2009. A total of 300,000 web-survey emails were sent in U.S., with 371 returned and 335 completed responses used in this study. For the European side, 120,000 web-survey emails were sent with 85 responses received and 60 completed responses used in this study.

3.3. Data Analysis

Simple regression analysis Factor analysis is utilized to assess validity of a questionnaire and to separate more accurate and appropriate factors from others, which are regarded as less useful and effective factors. To eliminate less effective variables, principle components factor analysis is utilized and these variables are rotated using the Varimax (variance maximization) procedure in order to identify which variables are independent from each other and which variables are correlated. The purpose of simple regression analysis in this study is to explore how independent variable beliefs and effects are related to the dependent variable attitude in using RFID technology. Also, simple regression is used to analyze

the relationship between attitudes and intentions in using RFID technologies in the U.S. and Europe.

4. Results

4.1. Consumer Demographic Profile

The frequency analysis of the U.S. and Europe consumer demographic information found (See Table 1) that the majority of the consumers tend to:

- be in the age group of 29-54 (29%);
- be females (51%) whereas males are 48%
- have a high school education (25%)
- have a annual household income between U.S.$25,000 - U.S.$74,999 (21%)

The results of the U.S. and Europe consumer demographic information also stated that the most of the consumers using RFID technology tend to be Generation X and Baby Boomers. The majority of the consumers, 76% in the U.S. and 68% in Europe, reported that they stayed in a hotel in the last six months. The majority of the consumers in the U.S. (61%) reported that they have not used any RFID technologies in a hotel and 51% have not used RFID technologies other than in the hotel industry. In Europe, 65% reported that they have not used RFID technologies in a hotel and 53% have not used RFID technologies other than in the hotel industry. The two most widely-used RFID applications by consumers in the U.S. are "electronic door lock systems" (31%) and "RFID Kiosk systems" (22%), whereas in Europe, 33% used "electronic door lock systems" and 23% used "cash-less payment systems". In the U.S., a majority of consumers (54%) reported that they are beginners in experience level in using RFID technologies. In the Europe, a majority of consumers (43%) stated that they didn't have any experience in using RFID technologies.

Table 1. The Demographic Profile of U.S. and European Consumers

Variables	Frequency	(%)	Variable	Frequency	(%)	Variable	Frequency	(%)
Citizenship			Gender			Annual Income (In U.S. Dollars)		
U.S.A	334	84.8	Male	183	48.8	Less than 24,999	48	12.2
Europe	60	15.2	Female	192	51.2	25,000-49,999	85	21.6
Age			Education Level			50,000-74,999	84	21.3
18 – 28	42	10.7	High School	3	.8	75,000-99,999	65	16.5
29 – 44	117	29.7	High School	98	24.9	100,000-149,999	47	11.9
45 – 54	115	29.2	College Degree	88	22.3	More than 150,000	42	10.7
55 – 63	71	18	Bachelor's Degree	93	23.6			
Over 64	34	8.6	Master's Degree	73	18.5			
			Doctoral Degree	22	5.6			

4.2. Attitudes of the Consumers

The results of multiple regression analysis with "attitudes" as the dependent variable and "beliefs, and affects" as independent variables are listed in Table 2 and Table 3. In the U.S., regression equation characteristics of "attitude" indicated a good R2 of 0.757. This indicated that 76% of the variation in "attitude" was explained in this equation. Also, the independent variables "beliefs and affects "are strong predictors of "attitudes" ($F = 514.566$; $p < .001$). The F-ratio was significant, indicating that the results of the equation could hardly have occurred by chance. In Europe, the regression equation characteristics of "attitude" indicated a good R2 of 0.537. This indicated that 53% of the variation in "attitude" was explained by this equation. The independent variable "affects" came out as strong predictors of "attitudes" ($F = 32.993$. $p<.001$). The other independent variable "beliefs" was not significant and is not the predictor of "attitudes". Both in the U.S. and

Europe, a t-statistic test was used for testing whether the two independent variables contributed information to the predictor variable "attitude".

Table 2. Results of Multiple Regression in the U.S.

Dependent variable			Attitudes		
Independent variables			Beliefs, Affects		
Multiple R			.870		
R2			.757		
Adjusted R2			.755		
Standard error			.700		
Independent variable	b	Beta	t	Sig.	VIF
Constant	-.034	.	-.201	.840	
Beliefs	.387	.352	8.795	.000	2.176
Affects	.637	.578	14.449	.000	2.176

In the U.S., if the t-value of an independent variable was found to be significant at the 0.05 level, then that variable was considered in the model. In Europe, if the t-value of an independent variable "affect" was found to be significant at the 0.05 level, than only "affects" can be considered in the model. In the U.S. and Europe, the results of regression analysis showed that the two coefficients carried positive signs. This indicated that there was a positive relationship between independent variables "beliefs and affects" and the dependent variable "attitude". In the U.S., it can be suggested that the "attitude" of the consumer to use RFID technology depended largely on their "beliefs and affects".

Therefore, the "beliefs and affects" of the consumer play a significant role in shaping consumer "attitudes" to use RFID technology in the U.S. hotel industry. In conclusion, the "attitudes" of consumers in using RFID technology depends on their beliefs and affects to use the technology. In Europe, "beliefs" does not play a significant role in the consumer "attitudes" to use RFID technology in the hotel industry. In Europe only "affects" of the consumer play a significant role in shaping consumer "attitudes" to use RFID technology in the European hotel industry.

Table 3. Results of Multiple Regression in Europe

Dependent variable			Attitudes		
Independent variables			Beliefs, Affects		
Multiple *R*			.732		
R^2			.537		
Adjusted R^2			.520		
Standard error			.861		
Independent variable	b	Beta	t	Sig.	VIF
Constant	1.135		2.277	.027	
Beliefs	.074	.089	.743	.461	.566
Affects	.762	.671	5.600	.000	.566

In the U.S. and Europe, to indicate the impacts of each independent variable, the partial correlation coefficient β is used in this study. In the U.S., the greatest effect was "affects" (β=0.578, Prob.<0.00), followed by "beliefs' (β=0.352, Prob.<0.00). In Europe, the only effect was "affects" (β=0.671, Prob.<0.00). The values of Variance of Inflation (VIF) for each variable in the U.S. and Europe did not exceeded 10.0, which indicated that there was no multi-collinearity in the model.

4.3. Intentions of the Consumers

In the U.S., the results of simple regression analysis (Table 4) showed that there was a positive relationship between the independent variable "attitudes" and the dependent variable "behavior intentions" to use RFID technology. The results indicated a good R^2 of 0.76, which indicated that 76% of the variation in "behavior intentions" to use RFID technology was explained by the "attitudes" of the consumer. In the U.S. it is suggested that the "behavioral intentions" to use RFID technology depended largely on the "attitudes" of the consumer to use RFID technology. The F-ratio indicated that the results of the equation could hardly have occurred by chance as "attitude" to use RFID technology is a strong predictor of "behavior intentions" of the consumer to use the technology. ($F = 1050.737$; $p < .001$). The t-statistic test to determine whether the attitude contributed to the prediction of the "behavior intentions" was found to be significant at the 0.05 level, so this variable was considered in the model.

Table 4. Results of Simple Regression in U.S.

Dependent variable			Intentions	
Independent variables			Attitudes	
Multiple R			.872	
R2			.760	
Adjusted R2			.759	
Standard error			.701	
Independent variable	b	Beta	t	Sig.
Constant	.716		5.076	.000
Attitudes	.880	.872	32.415	.000

In Europe, the results of simple regression analysis (Table 5) showed that there was a positive relationship between the independent variable "attitudes" and dependent variable "behavior intentions" to use RFID technology. The results indicated a good R^2 of 0.59, which indicated that 59% of the variation in "behavior intentions" to use RFID technology was explained by the "attitudes" of the consumer. The F-ratio indicated that the results of the equation could hardly have occurred by chance as "attitude" to use RFID technology is a strong predictor of "behavior intentions" of the consumer to use the technology. ($F = 83.906$; $p < .001$). The t-statistic test to determine whether the attitude contributed to the prediction of the "behavior intentions" was found to be significant at the 0.05 level, so this variable was considered in the model.

Table 5. Results of Simple Regression in Europe

Dependent variable			Intentions	
Independent variables			Attitudes	
Multiple R			.769	
R2			.591	
Adjusted R2			.584	
Standard error			.815	
Independent variable	b	Beta	t	Sig.
Constant	1.008		2.265	.027
Attitudes	.782	.769	9.160	.000

4.4. Differences between Attitudes and Intentions

An independent samples t-test was conducted to compare the attitudes of the consumers in the U.S. and Europe. The results showed that there was not a significant difference in the scores for the U.S. (M=5.00, SD=1.41) and for Europe (M=5.06, SD=1.24).The results suggest that consumers in the U.S and Europe do not have an effect on the attitudes to use the technology. This study suggests that the U.S. and European consumers have similar attitudes to use RFID technologies in hotels. The results for the independent t-test conducted to compare the intentions of consumers to use RFID technologies in the U.S. (M=5.11, SD=4.96) and Europe (M=4.96, SD=1.26) also showed that there were no significant differences in the scores. The study suggests that consumers have similar behavior intentions to use RFID technologies in the U.S and Europe.

Table 6. Results for Group Statistics

	Status	Mean	Std. Deviation	Std. Error Mean
Attitudes	U. S.	5.00	1.41	.077
	Europe	5.06	1.24	.160
Intentions	U. S.	5.11	1.42	.078
	Europe	4.96	1.26	.163

Table 7. Results of Independent Sample t-test

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Attitudes	Equal variances assumed	.666	.415	-.301	392	.763
Intentions	Equal variances assumed	1.949	.164	.763	392	.446

5. Conclusion

The results of this study provided significant insights to identify the beliefs and affects that the hotel guests have and the attitudes they hold that drive the intention to use innovative technologies (RFID) in the U.S. and European hotel industry. In the U.S., the results of the study showed that "beliefs" and "affects" were significantly related to consumer attitudes to use RFID technologies. In the Europe, it showed that only "affects" were significantly related to consumer attitudes to use RFID technologies. This suggests that European consumers may be more concerned about their privacy compared to U.S. consumers. In the U.S. and Europe, the results of the study showed that consumers' "attitudes" were significantly related to the "behavior intentions" to use RFID technologies. The study findings offered the new insights into the hotel industry segment, and that there are no significant differences between the attitudes and intentions of the consumers in the U.S. and Europe to use RFID technologies.

Overall, the hotel organizations today are facing extreme competition with a fluctuating economy and are forced to make huge investments in new technologies such as RFID. These results can influence the decision makers in the U.S. and Europe on the investments they make in such technologies. The hotel organizations in the U.S. and Europe need to further identify consumers' attitudes and their behavioral intentions to use new technologies.

5.1. Limitations

There are two major limitations in this study. For European consumers, the study used the non-probability sampling methods and does not have the complete list of population members who are frequent travelers. The other major limitation of this study is the low sample size of the European consumers. Further research employing larger samples in Europe is needed to fully analyze the relationship between variables. Also, the null responses and response rate of the consumers may have affected the significance of the variables in the study. The time and season of the study may also have had an impact on the significance of the study.

References

Agarwal, R., & Prasad, J. (1998). A conceptual and operational definition of personal innovativeness in the domain of information technology, *Information Systems Research,* Vol. 9 (2), pp. 204-215.

Ajzen, I. (1985). *From intentions to actions: A theory of planned behavior*. Heidelberg, Germany: Springer.

Ajzen, I., & Fishbein, M. (1977). Attitude-behavior relations: theoretical analysis and review of empirical research. *Psychological Bulletin*, 84, pp. 888-918.

Ajzen, I., & Fishbein, M. (1980). *Understanding Attitudes and Predicting Social Behavior.* Prentice-Hall Inc., Eaglewood Cliffs, NJ.

Ajzen, I., & Madden, T. J. (1986). Prediction of goal-directed behavior-attitudes, intentions, and perceived behavioral-control. *Journal of Experimental Social Psychology*, Vol. 22 No 5, 453-474.

Antonides, G., & Raaij, W. F. (1998). *Consumer Behaviour: A European Perspective*. John Wiley & Sons, England, UK.

Beaver, A. (1995). Lack of CRS accessibility may be strangling small hoteliers, the life blood of European tourism. *Tourism Economics,* Vol. 1(4), 341-355.

Buhalis, D., & Main, H. (1998). Information technology in peripheral small and medium hospitality enterprises: strategic analysis and critical factors. *International Journal of Contemporary Hospitality Management*, Vol. 10 (5), 198-202.

Cline, R. (2001). The future of hospitality e-business: How the internet has changed the hotel industry. *Lodging Hospitality*, 57 (7), 24-30.

Curtin, J., Kauffman, R, J., & Riggins, F, J. (2007). Making the most out of RFID technology: A research agenda for the study of the adoption, usage, and impact of RFID. *Inf Technol Manage,* Vol 8, 87-110.

Davis, F.D. (1989), "Perceived usefulness, perceived ease of use, and user acceptance of information

technology", *MIS Quarterly*, Vol. 13 No. 3, pp. 319-40.

Davis, F.D., Bagozzi, R.P. & Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", *Management Science*, Vol. 35, pp.982-1003.

Eckfeldt, B. (2005, September). WHAT DOES RFID DO FOR THE CONSUMER?. *Communications of the ACM, 48*(9), 77-79. Retrieved February 25, 2009, from Computers & Applied Sciences Complete database.

Erickson, G. S., & Kelly, E.P. (2007) Building competitive advantage with radio frequency identification tags. *Competitive Review-An International Business Journal,* Vol. 17 No.½, pp. 36-47.

Fishbein, M., & Ajzen. I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and behavior,* Addision-Wesley, MA.

Gunter, O., & Spiekermann, S. (2005). RFID and the perception of control: the consumers view. *Communications of the ACM*, Vol 48, 73-76.

Jones, P., Clarke-Hill, C., Shears, P., Comfort, D. & Hillier, D. (2004), "Radio frequency identification in the UK: opportunities and challenges", *International Journal of Retail & Distribution Management*, Vol. 32 No. 3, pp. 164-71.

Jones, P., Clarke-Hill, C., Shears, P., Hillier, D., & Comfort, D (2005), The benefits, challenges and impacts of radio frequency identification technology (RFID) for retailers in the UK. *Marketing Intelligence & Planning*, Vol. 23 No. 4/5, pp. 395-402.

Juban, R. L., & Wyld, D. C. (2004). Would you like chips with that? : Consumer perspectives of RFID. *Management Research News,* Vol. 27, 11/12, 29-44.

Lewis. W., Agarwal, R., & Sambamurthy. V. (2003). Sources of influence on beliefs about Information technology use: An empirical study of knowledge workers. *MIS Quarterly*, Vol. 27, 4, pp. 657-678.

Lin, K., & Lin, C. (2007). Evaluating the decision to adopt RFID systems using analytic hierarchy process. *Journal of American Academy of Business*, Vol. 11, 1; pg. 72

Nyheim, P., McFadden, F., & Connolly, D. (2004). *Technology strategies for the hospitality industry*. Pearson Prentice-Hall, Upper Saddle River, NJ.

O'Connor, P., (1999). *Electronic information distribution in the tourism and hospitality*. Oxford University Press, Oxford.

Oliver, R. L. (1997). Satisfaction: *A behavioral perspective on the consumer*. Irwin McGraw Hill, New York, NY.

Razzouk, N. Y., Seitz, V., & Nicolaou, M. (2008). Consumer concerns regarding RFID privacy: An empirical study. *Journal of Global Business and Technology*, Vol. 4, No. 1,69-78.

Rogers, E. M (1983). New product adoption and diffusion. *Journal of Consumer Research*, Vol.2, pp.290-301.

Rundh, B. (2007). Radio frequency identification (RFID) invaluable technology or a new obstacle in the marketing process?. *Marketing Intelligence and Planning*, Vol. 26 No. 1, 97-114.

Siguaw, J.A., Enz, C.A., & Namasivayam, K. (2000). Adoption of information technology in U.S. hotels: strategically driven objectives. *Journal of Travel Research*, Vol.39, 192–201.

Smith, A. D. (2005). Exploring radio frequency identification technology and its impact on Business systems. *Information Management & Computer Security*, Vol. 12, 1 pp. 16-28.

Spekman, R, E., & Sweeney II, P, J. (2006). RFID: from concept to implementation. *International Journal of Physical Distribution & Logistics Management*, Vol. 36 No. 10, pp. 736-754.

Venkatesh, V., Morris, M. F., Davis, G, B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified way. *MIS Quarterly*, Vol. 27, 3, 425-478.

Wang, Y., & Qualls, W. (2007). Towards a theoretical model of technology adoption in hospitality organizations. *International Journal of Hospitality Management*, Vol. 26, 560-573.

Wyld, D. C. (2006). RFID 101: the next big thing for management. *Management Research News.* Vol. 29 No. 4, pp: 153-174.

Zanna, M. P., & Rempel, J.K.(1988). Attitudes: A new look at on old concept. *The psychology of knowledge*. Cambridge University Press. NY.

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Techno-Managerial Assessment of an Agricultural Biotechnology Product –Vesicular Arbuscular Mycorrhiza (MYKOVAM): Focus on Technology Adopters

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ABSTRACT

The study looks into the adoption of an agricultural biotechnology product called MYKOVAM, a type of bio-fertilizer developed by the National Institute of Molecular Biotechnology and Biotechnology (BIOTECH) at the University of the Philippines Los Baños (UPLB). It is a fertilizer supplement and is intended to reduce the use of chemical fertilizers. It can be applied to fruit trees, agricultural crops, and reforestation species. The study presents a brief overview of the development of the technology, reviews studies that proves its efficacy, discusses how it is disseminated to the end-users, and identifies the major constraints to its being fully commercialized. A survey was conducted among its current and past adopters. Two-way tables, chi-square and t-test were then used to determine the factors relating to continued adoption. Issues related to its utilization were also identified. The impact of the agricultural biotechnology is illustrated with a comparison of the profitability of a sweet corn farmer before and after using MYKOVAM. The technology is ready for full-blown commercialization given that a proper technology transfer agreement is achieved between the developer and the potential investors.

1. Introduction

According to Qaim (2005), modern agricultural biotechnology has been adopted rapidly at the global level, even in developing countries. This is particularly true for genetically engineered (GE) or genetically modified (GM) crops. The Economic Research Service (ERS) of the U.S. Department of Agriculture (USDA) in its Briefing on Agricultural Biotechnology (2008) reported that U.S. farmers' adoption of GE crop varieties has jumped dramatically, mostly due to farmers' expectation of lower production costs, higher yields, and reduced pesticide use. In 2005, it was estimated that about 220 million acres of GE crops with herbicide tolerance and/or insect resistance traits were cultivated worldwide (ERS/USDA, 2008).

In the Philippines, initiatives in biotechnology started in 1980 with the creation of the National Institute of Molecular Biotechnology and Biotechnology (BIOTECH) in the University of the Philippines Los Baños (UPLB) (de la Cruz, 2000). BIOTECH continues to provide leadership in agricultural, forestry, industrial, and environmental biotechnology. From 1980 to 1999, there were a total of 266 agricultural biotechnology

R&D projects, with 80% of the funding coming from the government, 15% from international development agencies, and the remaining 5% from the private sector. De la Cruz (2000) also stressed that the main goal of biotechnology R&D is to harness its potential to increase productivity of all the commodities in the agriculture and fishery sectors. This would include tapping agricultural biotechnology to develop inputs such as bio-fertilizers and biocontrol of harmful pests and diseases.

The impact of agricultural biotechnology for developing countries suggests that it is perceived to bring substantial benefits for both producers and consumers. Moreover, agricultural biotechnology is seen as contributory to poverty reduction and food security if it will increase the quality and yields of food crops, and more importantly, if the available technology is adopted by the small farmers (Asian Development Bank, 2001).

Biofertilizers comprise one group of agricultural biotechnology products that have been developed to enhance crop growth and yield through biological means like microorganisms, fungal and bacterial inocula, and to minimize the use of inorganic fertilizers. There are two groups of biofertilizers currently commercially available. The first group is composed of nitrogen-fixers which are bacteria-based. These products include NitroPlus which is applicable to mungbeans, peanuts, and soybeans, and BIO-N which was developed mainly for rice and corn. The second group consists of mycorrhizal fungi which infect the roots of the host plant where they proliferate (ATIK, 1992). Mycogroe, Mycobeads, Direct Seeding Blocks (DSBs), and MYKOVAM belong to the second group of biofertilizers. Compared to other biofertilizers, MYKOVAM has a wide range of applications including agricultural crops, fruit trees and reforestation species (Javier and Brown, 2009).

This study, a techno-managerial assessment, takes a closer look at the factors related to the utilization of an agricultural biotechnology product called MYKOVAM, a biofertilizer which was developed by the National Institute of Molecular Biotechnology and Biotechnology (BIOTECH) at the University of the Philippines Los Baños (UPLB) in the late 1980s. Although there have been numerous studies conducted to determine the efficacy of MYKOVAM for different crops under different conditions, not one has looked at why there are some who have continued using the technology and there are those who stopped utilizing it. The study therefore aims to identify and assess the factors related to the continued adoption of the technology. Problems relating to the utilization of MYKOVAM were identified. It also looked at the economic benefits of adopting the technology from the point of view of the end-users, such as the farmers. Lastly, the impact of its utilization was evaluated through the functional aspects of the farm business. This study can prove useful to technology disseminators who are interested in promoting cutting-edge technologies, but also to potential local and international investors who may be looking for new and better agri-biotechnology products to offer to the market.

2. Methodology

A descriptive and evaluative type of research design was employed in the study. The descriptive research design focused on the agricultural biotechnology product, the technology dissemination and adoption process, the profile of the current and past users of the product, the factors related to the continued adoption of the technology, and the problems encountered in its utilization. Addtionally, the evaluative research design was used to determine the impact of using MYKOVAM in the four functional areas of the business of a current adopter.

Non-probability sampling was used to locate the users of MYKOVAM. Thirty (30) farmers were interviewed - 12 past adopters and 18 current adopters. The selected respondents were limited to farmers who planted agricultural crops and some fruit-bearing trees. A single farmer from Ilagan in Isabela province north of Manila, who produces sweet corn, served as a case study to highlight the managerial impact of MYKOVAM on the four business functions, which include production, marketing, finance, and human resources. Chi-square and t-test analyses were also used to determine the

variables associated with the farmer's decision to continue adopting the technology.

3. Results and Discussion

3.1 Description of the Agricultural Biotechnology

The Vesicular Arbuscular Mycorrhiza or MYKOVAM is a soil-based fertilizer, a combination of three fungi species, namely, *Glomus macrocarpum, Glomus etunicatum,* and *Gigaspora margarita*. When the fungi infect the roots, they form a close association with the plant when inoculated to the seedlings and help the plants absorb water and nutrients resulting in increased plant growth and yield. MYKOVAM is also said to prevent root infection by pathogens and increase plant tolerance to drought and heavy metals. It must be noted, however, that the increase in yield due to mycorrhizal inoculation also depends on the type of crops planted, soil nutrients, soil pH, and the presence of mycorrhizal population.

MYKOVAM was developed in the late 1980's by Dr. Reynaldo E. de la Cruz, former director of BIOTECH, and was introduced to the market in 1995. Farmers and some firms have adopted it all over the country. In Mindanao, particularly in Cotabato, Dr. Alexis de Manuel pioneered the use of MYKOVAM technology in his farm and has been successfully using it since (www.blog.agriculture.ph). It has been proven to increase the growth and yield of agricultural crops, forest trees, fruit trees and ornamental plants, and can also be a biological control against root pathogens. MYKOVAM is commercially available only in BIOTECH, but there is the potential for it to be mass-produced and commercialized profitably if the technology is fully transferred or licensed to private investors.

MYKOVAM is intended to reduce the use of inorganic fertilizer. It is cheap and is very easy to use. Priced at Php35 per kilogram, it can fertilize 200 plants and unlike chemical fertilizers, the application is just once – either during seed sowing, during pricking, or transplanting. From the pilot tests conducted, it can replace 60 to 85% of the inorganic fertilizer requirement but can increase yield at the same time. Aside from its primary function of plant nutrient uptake, mycorrhizal fungi have other benefits such as an increase in drought resistance of plants, enhanced resistance of plants to diseases, production of growth hormones and growth regulating hormones, promotion of activity of other beneficial organisms, improvement of soil aggregation, prevention of root senescence and increased water absorption.

3.2 Related Experiments on MYKOVAM

There have been a significant number of experiments to test the efficacy of MYKOVAM on different plant species. In one instance, three varieties of coffee (*C. liberica, C. robusta* and *C. excelsa*) were tested either inoculated or uninoculated with MYKOVAM in two separate experiments. One was conducted under field conditions in Batangas, and another was conducted under greenhouse conditions at BIOTECH. It was found out that *C. robusta* and *C. excelsa* responded positively to inoculation with MYKOVAM. However *C. liberica* did not respond well due to the need for a longer inoculation period. It was concluded in the study that there was a strong positive correlation between mycorrhizal infection and height increment (Segismundo, 2000).

A study made by BIOTECH showed that inoculation with MYKOVAM made a big difference in plant height. Test plants that showed evidence of positive response were ipil-ipil (*Leucaena leucephala*), mango, tamarind, acacia, eucalyptus, and pine trees. Almost 60 – 85% of chemical fertilizer requirements can be replaced by MYKOVAM. De la Cruz (1989) studied the response of six Acacia species to mycorrhizal fungal inoculation. Together with his colleagues, they generally measured and compared the growth and biomass of mycorrhiza-inoculated seedlings from that of uninoculated. It was concluded that mycorrhizal inoculation could significantly increase the height and biomass of Acacia species, particularly *Acacia colei,* and *Acacia simsii*.

In another study, *Eucalyptus deglupta* seedlings were inoculated with mycorrhizal tablets while another group was uninoculated to serve as control. The experiment was set with increasing fertilizer levels of 0, 12.5, 25, 50, and 100 grams of complete fertilizer per plant. The growth of the seedlings was assessed during a ten-month period. After ten months, it was generalized that inoculated trees grew much better than uninoculated trees in all fertilizer levels. Inoculated trees required only ten grams of fertilizer to achieve a height of 135cm in ten months while uninoculated trees require 72 grams of complete fertilizer. This showed a savings of 62 grams or about 86% of complete fertilizer.

Another experiment was conducted by BIOTECH on pineapples in 2003. It was found that pineapple plants responded positively to mycorrhizal inoculation. Six months after planting, these plants were greener and healthier compared to the uninoculated counterparts.

There were also other studies that involved yellow and red onions (Gergon, et.al., 2004) as well as mahogany (*Swietenia Macrophylla King).* Tarranco-Castaneto (2003) showed how MYKOVAM improved the growth of these plants and demonstrated a reduction in the use of fertilizer inputs.

3.3 Technology Diffusion

The responsibility for the technology diffusion of MYKOVAM rests on UPLB BIOTECH, specifically its Communications and Development Department. The most common method to introduce the MYKOVAM biotechnology is by putting up pilot farms. Under this arrangement, farmer-cooperators provided the land, labor in land preparation and the seeds while UPLB BIOTECH provided the MYKOVAM as well as free monitoring. Seminars were also conducted both in UPLB BIOTECH and at the farms. Promotion through word-of-mouth to other farmers was also encouraged among the farmers who were satisfied with the results. Other media and promotional activities utilized included radio, television advertisements, brochures, flyers, and participation in trade fair exhibits.

3.5 Technology Commercialization

In a study by Rola (2000), it was mentioned that biotechnology product constraints are both technical and economic in nature. For one, the usual technology takers belong to small and medium scale enterprises (SMEs) who do not have the financial capabilities to sustain commercial production. Another is that the high value of the biotechnology product (including interest rates) compared to substitute technologies hampers successful commercialization. Other issues that may be looked into include the role of Intellectual Property Rights (IPRs) in technology development and transfer, biosafety rules and regulations, and how the technology will be managed once it is on the market and in the farmers' fields. In the case of the MYKOVAM technology, while it is already fully developed and ready for full-blown commercialization, the biggest constraint which prevents it from being commercialized and produced on a large scale is the developer's concern that the technology may not be properly replicated, (e.g. the quality of MYKOVAM will not be maintained.) There have been many potential investors who have expressed interest in acquiring the MYKOVAM technology but the strict screening of the developer has not resulted in any licensing agreements.

3.6 Profile of Technology Adopters

Among the users of the technology, 12 were past adopters and 18 were current adopters of MYKOVAM. More than half of the respondents were in the 51 to 60 year old bracket. At the time of the survey (2005), past adopters were between 51 to 60 years old while current adopters were between 41 to 50 years old. Most of the past users had stopped using MYKOVAM ten years earlier. This suggests that younger farmers are more likely to try new technologies for their farms. Most of the current users were male and were married, with five to six members in the family. Half of the past and current adopters finished college though there were more current adopters who were college graduates. Table 1 shows the socio-demographic summary of the adopters.

Table 1. Socio-demographic Characteristics Versus Continued Adoption of the Technology

	Past adopter		Current adopter	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Total number of respondents	12	100	18	100
Age range				
30-40	1	8.3	7	38.9
41-50	4	33.3	10	55.5
51-60	7	58.4	1	5.6
above 60				
Gender				
Male	4	33.3	12	66.7
Female	8	66.7	6	33.3
Civil status				
Married	8	66.7	15	83.3
Single	4	33.3	2	11.1
Widowed	0	0	1	5.6
Household size				
2-4	4	33.3	6	33.3
5-7	8	66.7	12	66.7
Educational attainment				
High school	2	16.7	2	11.1
College	5	41.7	10	55.6
Master's	3	25.0	4	22.2
Ph.D.	1	8.3	2	11.1
Post doctorate	1	8.3	0	0

More than half of the respondents have been in the farming business for one to ten years. Most of the past adopters have been in the business for 21 to 31 years while more of the current adopters were in the farming business for one to ten years (see Table 2). All the respondents in general mostly belonged to the small scale farmer group having only one hectare of land. The current users owned an average of five hectares of farm land. On the other hand, more than half of the past users had farm sizes less than one hectare (see Table 3).

Table 2. Number of Years in the Farming Business Versus Continued Adoption of the Technology

	Past adopter		Current adopter	
Years in business	Frequency	Percentage (%)	Frequency	Percent age (%)
1 to 10 years	3	25.0	9	50.0
11 to 20 years	3	25.0	2	11.1
21 to 30 years	4	33.3	5	27.8
31 to 40 years	2	16.7	2	11.1
Total	12	100	18	100

Table 3. Farm Size Versus Continued Adoption of the Technology

	Past adopter		Current adopter	
Farm size	Frequency	Percentage (%)	Frequency	Percentage (%)
0.1ha to 0.9 ha	7	58	6	33
1ha to 9ha	5	42	11	61
Above 10ha			1	6
Total	12	100	18	100

Almost all past adopters hired one to ten laborers while more current adopters had 11 to 20 or more than 21 laborers. A majority of the current users used personal resources as their source of capital. More current adopters used a combination of loans from cooperatives, loans from relatives, loans from the government and bank as their other sources of capital. A majority of the respondents depended solely from the salaries from employment as their major source of income. However, more current adopters had other businesses as their other sources of income.

Most of the respondents planted fruit trees and agricultural crops. The past and current adopters of the technology both planted fruit trees; however, more current adopters planted a combination of fruit trees, agricultural crops and reforestation species. Current users were more involved in multiple cropping (see Table 4).

Table 4. Crops Planted on the Farm Versus Continued Adoption of the Technology

	Past adopter		Current adopter	
Crop planted	Frequency	Percentage (%)	Frequency	Percentage (%)
Agricultural crops	3	25.0	3	16.7
Reforestation species	2	16.7	2	11.1
Fruit trees	5	41.6	7	38.9
Agricultural crops and fruit trees	2	16.7	4	22.2
Agricultural, reforestation species and fruit trees			2	11.1
Total	12	100	18	100

Both past and current users of MYKOVAM received government assistance. More current users were provided with technical (i.e., seeds, monitoring of farm) and financial assistance (i.e. loans) by the government, mainly the Department of Science and Technology (DOST). The farmer's sources of information about MYKOVAM among the past and current adopters of the technology were mostly other farmers and field personnel from the Department of Agriculture (DA) and from the DOST. However, most of the current adopters claimed to obtain the information from the product team leader of BIOTECH and from researchers. Among the methods of dissemination, demonstration farms were identified to be the most effective among the current adopters. This is consistent with the study made by Barao (1992) that on-farm demonstration was an effective way to transfer technology to the farm level. After the information and dissemination of the technology, all of the respondents (past and current users) were convinced right away to adopt the MYKOVAM technology.

Among past and current users of MYKOVAM, more current adopters purchased the biofertilizer yearly. Most of the past and current users of the technology perceived the overall acceptability of MYKOVAM to be good (see Table 5).

More of the respondents began to use MYKOVAM during the period of 2001 to 2005. More than half of the past adopters used the biofertilizer during the years 1994 to 2000. A majority of the current adopters started utilizing MYKOVAM during the years 2001 to 2005. A majority of the current adopters claimed that the developers of the technology could be easily reached to purchase the product while almost all of the past users claimed that they could not easily access the developers of the product. Among the respondents, more than half of the current users said that the technology was very much available. Half of the past adopters perceived the product as easily available.

Table 5. Overall Acceptability Rating Versus Continued Adoption of the Technology

	Past adopter		Current adopter	
Overall acceptability rating	Frequency	Percentage (%)	Frequency	Percentage (%)
Very good	3	25	7	38.9
Good	6	50	10	55.5
Fair	3	25	1	5.6
Total	12	100	18	100

Chi-square test analysis showed that the educational attainment of a farmer was associated with the farmer's decision to continue adopting the technology (see Table 6). T-test analysis showed that accessibility of BIOTECH to the technology adopters and the number of laborers were the ratio variables related to continued adoption of MYKOVAM technology (see Table 7). It should be noted that the number of laborers is also an indicator of farm size.

Table 6. Significant Variables Identified by the Chi-Square Tests

Variables	Pearson statistics
Educational attainment	0.49 **

** at 5% level of significance

Table 7. Significant Variables Identified by t-tests

	Means		2- tail significance
Variables	Past adopter	Current adopter	
Accessibility of BIOTECH	2.9 ***	1.3***	.000 *
Number of laborers	4	10	0.056 **

* at 1% level of significance
** at 10% level of significance
***1 - Very accessible
2 - Accessible
3 - Not accessible

3.7 Problems Encountered with the Technology

While a majority (66%) of the respondents found no problems in using MYKOVAM, there were still a few who claimed to encounter some problems. Among these were inconsistency in effectiveness (11%), tediousness in the application as it requires individual dosage per plant (11%), long- term usage required to see its effect (6%), and the need to combine MYKOVAM with compost to realize its full effects on the crops (6%).

There were also reported problems in procuring MYKOVAM as it was only available from UPLB BIOTECH. This was reflected as the distance of the farms pointed out an issue which was related to the other identified issues of high transportation costs and irregularity of production.

3.8 Impact on the Functional Areas of the Business: The Case of a Sweet Corn Farmer

A sweet corn producer from Ilagan, Isabela was used as the case subject to illustrate the impact of MYKOVAM technology on the four business functions. The farmer has a land area of 1.2 hectares and has 14 laborers. It was found that the yield increased by 38% while the cost of fertilizer decreased to Php2,675. This is about a 48% reduction from the cost of fertilizer applied before using MYKOVAM. However, there was an increase in the labor cost by Php2,700 due to the increase in yield that resulted in more corn to be harvested, dried, and packaged. Net profit increased by as much as 162% from Php10,601 to Php27,791 after using MYKOVAM. A summary showing before and after the use of MYKOVAM is presented in Table 8:

Table 8. Impact of Using MYKOVAM on Business Functions (Based on 1 cropping cycle)

Business Function	Before using MYKOVAM	After Using MYKOVAM
Production		
Yield	5,200 pcs. corn harvested	7,182 pcs. corn harvested
Inputs	Php5,100 cost of fertilizers	Php2,675 cost of fertilizers
Marketing		
Selling price	Php7.00 per pc.	Php 7.50 per pc.
Total sales	Php36,400	Php56,865
Personnel	14 laborers Php10,500	23 laborers (14 regular laborers plus 9 seasonal laborers) Php13,200
Finance		
Net profit	Php 10,601	Php 27,791

4. Conclusion

Based on the results of the study, the propensity of farmers to adopt the technology is dependent on their level of education, their proximity to the source of the technology, and the number of laborers they employ since technology application is a bit tedious. The impact on the business functions showed that farmers will benefit from using the technology since its use will decrease the cost of inputs but will significantly increase the yield. These, among others, translate to an increase in profit. In addition, MYKOVAM can be applied to agricultural crops, fruit-bearing trees, some reforestation species, and ornamental plants. This wide range of application as well as the financial benefits makes the technology more attractive for adoption by farmers.

Future studies can further demonstrate the economic benefits of MYKOVAM to other crops. Commercialization of the MYKOVAM biotechnology will address the problems raised by the technology adopters regarding accessibility and irregularity in production. The technology has potential not only in the domestic market but also in the international market provided that there would be a proper and acceptable technology transfer agreement between the developer and the potential investors.

References

Asian Development Bank. (2001). Present status of agricultural biotechnology in Asia. In Asian Development Bank, *Agricultural biotechnology, poverty reduction, and food security* (pp. 19-32). Retrieved March 31, 2009 from http://www.adb.org/Documents/Books/Agri-Biotech/chap03.pdf

Asian Development Bank. (2001). Using biotechnology to address poverty reduction and food security in Asia. In Asian Development Bank, *Agricultural biotechnology, poverty reduction, and food security* (pp. 51-61). Retrieved March 31, 2009 from http://www.adb.org/Documents/Books/Agri-Biotech/chap05.pdf

Barao, S. M. (1992). Behavioral aspects of technology adoption. *Journal of Extension*, *30* (2). Retrieved March 21, 2009 from http://www.joe.org/joe /1992/a4.php

BIOTECH (2002). Demonstration of the efficacy of biofertilizers on high-value crops**.** *Detailed Research Program Proposal.*

BIOTECH (2003). Demonstration of the efficacy of biofertilizers on high-**v**alue crops. *Program Annual Report.*

De la Cruz R.E. (1989). Mycorrhizal researches on MPTS. Paper presented at the Winrock International-sponsored seminar-workshop on Multipurpose Tree Species held at Los Baños, Laguna.

De la Cruz R.E. (1994). MYKOVAM 1- Vesicular Arbuscular Mycorrhizal (VAM) fungi for agricultural and forestry crops. Paper presented during the 5th DOST Annual Science and Technology Fair.

De la Cruz R.E. (2000). Philippines: challenges, opportunities, and constraints in agricultural biotechnology, 58-63. Retrieved March 21, 2009 from http://www.cgiar.org/biotech/rep0100/Delacruz.pdf

Economic Research Service (ERS)/USDA Briefing Room. (2008). Agricultural biotechnology: adoption of biotechnology and its production impacts. Retrieved March 21, 2009 from http://www.ers.usda.gov/Briefing/Biotechnology/Chapter1.htm

Evangelista, A. (2008). Business plan for a BIO-N fertilizer concentrate production plant in the UPLB Science and Technology Park. *Unpublished Special Problem Report*. University of the Philippines Los Banos.

Gergon, E. B., Brown M B., & Milleo, S.A. (2004). Enhancing yield of onion (Allium cepa L.) through mycorrhizal inoculants in Meloidogyne graminicola-infested soil. *Proceedings of the 4th International Crop Science Congress.* Brisbane, Australia. Sept 26 – Oct 1, 2004. Retrieved May 11, 2009 from http://www.cropscience.org.au/ics 2004 /poster/2/5/6/1448_gergoneb.htm

Hall, B.H., & Khan, B. (2002). Adoption of new technology. In *New Economy Handbook* (pp.1-38). Retrieved March 21, 2009 from http://www.econ.berkeley.edu/~bhhall/papers/HallKhan03diffusion.pdf

International Institute of Rural Reconstruction. (1992). Soil and water conservation technologies and agroforestry systems. *Agro Forestry Technology Information Kit (ATIK).* Silang: International Institute of Rural Reconstruction.

Javier, P., & Brown, M. B. (2009). Bio-fertilizers and bio-pesticides research and development at UPLB. Retrieved May 11, 2009 from http://www.agnet.org/library/eb/602/eb602.pdf

Qaim, M. (2005). Agricultural biotechnology adoption in developing countries. *American Journal of Agricultural Economics*, *87* (5), 1317-1324. doi:10.1111/j.1467-8276.2005.00825.x

Padolina, W.G. (2000). Agricultural biotechnology: opportunities and challenges for the Philippines. *Discussion Paper Series No. 2000-27.* Philippine Institute for Development Studies.

Rola, A. C. (2000). Economic perspective for agricultural biotechnology research planning. *Discussion Paper Series No. 2000-10.* Philippine Institute for Development Studies.

Segismundo, J. M. P. (2000). Inoculation with Mycorrhizal fungi (MYKOVAM) and Plant Growth Promoting Rhizobacteria (PGPR) for enhanced

growth of three coffee cultivars. *Research II.* Lipa City National Science High School.

Tarranco-Castaneto, Y. A. (2003). Growth response of mahogany (Swietenia Macrophylla King.) cutting to applied Mykovam and Biocore. *Unedited version paper*. XII World Forestry Congress 2003, Quebec, City, Canada. Retrieved May 11, 2009 from http://www.fao.org/DOCREP/ARTICLE/WFC/XII/0125-B4.HTM

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How Can Wal-Mart and Carrefour Offer a Better Shopping Experience? An Investigation of Chinese Consumers' Shopping Satisfaction

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ABSTRACT

This study intends to examine how different store image attributes affect shopping satisfaction for consumers of Chinese discount stores (Lianhua and Hualian) and global discount stores (Wal-Mart and Carrefour). Previous studies have suggested that consumers' evaluation of store image influence their shopping satisfaction toward stores. Merchandise, convenience, sales associates, store congestion, and store atmosphere served as store image attributes in this study. Multiple regressions were used with data obtained from consumers of Shanghai, China. The results indicate that merchandise and convenience are significantly related to shopping satisfaction of consumers of Chinese discount stores, while sales associates and store atmosphere are important to shopping satisfaction of Wal-Mart consumers, and sales associates and store congestion are related to Carrefour consumers' shopping satisfaction. The managerial implications for these retailers are also discussed.

1. Introduction

China is one of the largest emerging markets in the world with an average 9% annual growth rate over the past two decades and a fast-growing middle class that is estimated close to 50 million (Barboza, 2007, February 28). Since China allowed 100% foreign investment in the retailing sector, its retail market has grown tremendously (Shi & Yang, 1998). China's retail market size is presumed to be the world's second largest trailing only the United States, but it is expected to grow by approximately 34% between 2008 and 2012, reaching a total value of over US$ 1.4 trillion ("China to become", 2008). This could make China the largest retail market in the world. Moreover, the share of organized retailing in China has been well below other emerging markets such as Malaysia and Thailand (Fernandes, Gadi, Khanna, Mitra, & Narayanswamy, 2000). These figures suggest that the growth potential for the Chinese retail market is tremendous and highlight the fact that China is one of the most lucrative markets for global retailers.

Contrary to all these positive aspects of the retail landscape for foreign retailers, the sales revenues and investment returns of early-movers to the Chinese retail market have not been impressive (Cui & Lui, 2001; Ness, 1999; Prystay, 1997; Rheem, 1996). One of the

challenges they have faced is comprehension of Chinese consumers' cultural values that often influence consumption behaviors and attitudes (Berry, Segall, & Kagitcibasi, 1997; Egri & Ralston, 2004; Hofstede, 1991). Mai and Zhao (2004) noted that "how to introduce a Western style shopping environment into the Chinese way of life becomes a challenge" (p. 58). Lam (1995) and Prystray (1997) attributed global retailers' slow start in China to their lack of understanding Chinese consumers' shopping behaviors. Consequently, understanding Chinese consumers is critical to the success of global retailers in China (Wong & Yu, 2003).

It is widely believed that consumers' favorable perception of a store image is an important indicator of their store preference and choice. With this notion in mind, various researchers have attempted to identify specific attributes of store image that affect consumers' shopping satisfaction and store patronage (e.g., Bloemer & Ruyter, 1998; Kim & Chen-Yu, 2005; Kim & Jin, 2001). As China is emerging as a lucrative market for global retailers, researchers and marketers have extended their interest in this matter to Chinese consumers (e.g., Ettenson & Wagner, 1991; Hu, 2002; Li, 2008; Wong & Yu, 2003). However, these studies were either cross-cultural or cross-generational, and little research has compared the influence of store image on consumers' shopping satisfaction between global and domestic retailers or between different global retailers. Since shopping satisfaction leads to store revisits (Hutcheson & Moutinho, 1998), global retailers need to understand factors that contribute to their customers' shopping satisfaction. Therefore, the purpose of this study is to explore the different ways in which store image attributes affect the level of shopping satisfaction for consumers of two global discount stores, Wal-Mart and Carrefour, and two domestic discount stores, Lianhua and Hualian Gi Mai Seng (Hualian hereafter).

2. Literature review

2.1. China's Retail Market

With a fast GDP growth rate, a population of 1.3 billion, and middle-class expansion, China has been the center of global retailers' attention. The sales of consumer goods in China have increased by about 200% since 1995, reaching over US$ 980 billion (National Bureau of Statistics of China, 2006). The retail sales of December 2008 were up 20.8% compared to the same period a year before (Fong, 2009, January 22). Per capita urban disposable income has more than doubled since 2001, recording above US$ 2 billion in 2007 (National Bureau of Statistics of China, 2006).

In July 1992, the Chinese government partially opened its retail market to foreign retailers and investors with the hope of expediting the nation's industrial growth and generating more jobs (Lam, 1995; Shi & Yang, 1998). However, in the earlier years of this "open-door" policy for China's retailing sector, joint venture was the only government-endorsed form of foreign direct investment, and it was permitted only in six major cities - Beijing, Shanghai, Tiajin, Guanghou, Dalian, and Qingdao - and five special economic zones - Shenzhen, Zhuhai, Shantou, Xiamen, and Hainan (Brunn, 2006). In December 2004, China had completely lifted all restrictions imposed on foreign retailers (Uncles & Kwok, 2008).

Since the Chinese government has allowed foreign retailers to have wholly-owned entities throughout China, modern retail formats, such as supermarket/hypermarket-type discount stores, have become the center of China's retail development (Lo, Lau, & Lin, 2001; Miu & Perhirin, 2003). This change to China's retail structure was prompted by foreign retailers' investments in China, but was quickly followed by domestic retailers (Garner, 2005). Foreign retailers such as Wal-Mart and Carrefour, which have substantial experience in modern retail format operations, have increased Chinese consumers' and domestic retailers' interest in modern retail formats (Moreau, 2008). As a result, the number of modern supermarket stores in China increased from approximately 10,000 in 2002 to over 15,000 in 2005, and supermarket retail sales more than doubled, from US$ 160 billion in 2002 to US$ 350 billion in 2005 (National Bureau of Statistics of China, 2004; 2006). With continuous near double-digit GDP

growth, large Chinese populations with an expanding middle class and a growing number of Chinese consumers with sophisticated tastes, supermarket/hypermarket-type discount stores continue to be the focus of China's retail development.

2.1.1. Discount Stores in China

Wal-Mart and Carrefour, the world's largest and second largest retailers, entered the Chinese market in 1996 and 1995, respectively, in hopes of taking a large share of the fastest-growing and maybe most-promising retail market in the world (Li, 2008). Wal-Mart and Carrefour have employed different business strategies in China. While Carrefour has displayed more adaptability to Chinese culture and customized store formats and merchandise to meet local needs, Wal-Mart has tended to maintain its centralized strategy that works effectively in the U.S.

Regardless of their different strategies in China, Wal-Mart and Carrefour both have superior knowledge of store operations, global sourcing networks, and financial strengths that allow them to be successful in the Chinese market. However, the performance of these two global retailers in the Chinese market has fallen short of business expectations. Wal-Mart and Carrefour have faced not only fierce competition from each other but also from the Chinese domestic retailers. Uncle and Kwok (2009) contended that Chinese discount retailers dominate modern retailing in China. In 2005, China had about 400 different domestic retail chains operating approximately 15,000 hypermarkets and supermarkets (National Bureau of Statistics of China, 2006). Carrefour and Wal-Mart are the two leading global retailers in China, but their store counts are exceeded by their domestic competitors such as the Lianhua Chain. For example, Wal-Mart and Carrefour, at last count taken from their web sites, operate 138 supercenters and 135 hypermarkets in China, respectively. In contrast, Lianhua operates 3,872 supermarkets, hypermarkets, and convenience stores as of December 2008 ("Lianhua supermarket," 2009), and another fast-growing Chinese discount retailer Hualian operated 1,693 stores nationwide in 2003 (Bean, 2006).

2.1.2. Store Image Attributes

It is widely believed that one of the most significant determinants of consumers' decisions for shopping at a certain store are product-related attributes (Kahle, 1986) such as prices or tangible values of the goods the store offers (Zeithaml, 1988). However, the new paradigm suggests that multiple factors influence consumers' decisions for store selection and the importance of store image attributes in determination of consumers' store choice has been added by various researchers. For example, Stewart (1997) stated that consumers' patronage behavior depends on the total assessment of multiple factors rather than a single factor. These factors other than product-related attributes include convenience (Arnold & Reynolds, 2003), emotions (Mattila & Enz, 2002; Wang, 2009), store brand image (Martenson, 2007), services (Schmitt, 1997), cultural differences (Griffin, Babin, & Modianos, 2000; Shim & Eastlick, 1998), and store ambience (Schmitt, 1997).

The importance of the store image concept was first addressed by Martineau (1958). Since then, various scholars have attempted to determine store image attributes and their impacts on consumer behaviors. Erdem, Oumlil, and Tuncalp (1999) and Samli (1998) highlighted the significant influence of store image attributes on consumers' patronage behavior. Babin and Darden (1995) also confirmed that the consumer interface of a shopping environment affects his or her shopping experience and choice of store.

Martineau (1958) described store image as functional and emotional aspects of the store that convey its "personality" to consumers' minds. Samli (1998) discussed that the functional characteristics include merchandise assortment, store layout, store location, and price/value that are directly comparable to competitors while the emotional characteristics are intangible attributes such as convenience, services, and store atmosphere. Lindquist (1974) used nine store image attributes: merchandise, service, clientele, physical facilities, convenience, promotion, store ambience, and post-transaction satisfaction. Doyle and Fenwick (1974) identified product, price, assortment, styling, and

location as five attributes that constitute a store image. Bearden (1977) proposed seven attributes (price, product quality, assortment, store ambience, location, parking facilities, and sales associates), but found that only four attributes (store ambience, location, parking facilities, and sales associates) significantly influence consumers' decision for shopping location. By comparing management- and customer-perceived store images for 10 attributes - sales people, service policies, assortment/selection, layout, attractiveness, price, convenience, quality of product, store improvement and community involvement - Samli, Kelly, and Hunt (1998) diagnosed the areas for improvement in store performance. Using Greek supermarket shoppers, Theodoridis and Chatzipanagiotou (2009) identified six store attributes: products, pricing, atmosphere, personnel, merchandising, and in-store convenience, and found that only products, pricing, personnel, and in-store convenience were significant determinants of customer satisfaction. Some studies grouped multiple store image attributes into dimensions by similar characteristics. For example, Wong and Yu (2003) classified various attributes into the dimensions of location, merchandise, service, sales and incentives, popularity, and facility, while Mitchell (2001) grouped attributes into physical, psychological, time and convenience, and financial dimensions.

Without universal agreement on which store image attributes should be included in the context of the supermarket/hypermarket setting, the intention of this research is to focus on store image attributes which have frequently appeared in the literature: merchandise, convenience, sales associates, store congestion and store atmosphere.

2.1.3. Chinese Consumers' Shopping Behaviors

One of the notable changes since China's "open-policy" toward retail is that more Chinese consumers have become savvy shoppers and begun to pay attention to other criteria such as product quality and brand names rather than prices or tangible values (Tai, 2008). For example, a nationwide survey by Gallup China in 1994 revealed that 52% of urban Chinese consumers intended to pay more money for quality products and 41% of urban Chinese consumers purchased products based on brand names rather than prices (Li & Gallup, 1995). In respect to decisions for shopping destination, Chinese consumers place quality, service, and variety before value (Chang, 2004). Dissimilarities of shopping behaviors are also documented among consumers from different parts of China. For example, Tai (2008) reported that consumers in Shanghai favor foreign goods over domestic ones, and they are the most brand-oriented consumers in China.

In the context of supermarket/hypermarket shopping, Chinese consumers prefer traditional markets (e.g., wet market and street vendors) for their fresh food consumption (Goldman, 2000), especially consumers in smaller cities (Mai & Zhao, 2004). Goldman (2000) profiled Shanghai consumers' store choices based on product types and the result shows that consumers favor hypermarkets for general merchandise, supermarkets for processed food, and traditional stores for fresh food. Mai and Zhao (2004) characterized Beijing consumers' motivations for supermarket/hypermarket selection. The data suggests that location (proximity to home), merchandise assortment, quality, and price influence where consumers shop. Like Shanghai consumers, Beijing consumers also use supermarkets/hypermarkets "selectively" based on what they intend to purchase (Mai & Zhao, 2004).

Regarding behavioral differences toward domestic and global retailers, Kim and Jin (2001) investigated South Korean consumers' patronage behaviors. The results of their study indicate that South Korean consumers of global discount stores displayed higher degrees of excitement, shopping satisfaction, and revisit intentions than those of South Korean discount stores. Although Kim and Jin's study (2001) used South Korean consumers', the results may inspire researchers to investigate Chinese consumers. For instance, Chinese consumers exhibit different behaviors in purchase decisions for domestic and imported clothing (Wang et al., 2004). Therefore, Chinese consumers may have different expectations from global and Chinese discount

stores, and these expectations may affect their shopping satisfaction at these stores.

2.2. Consumers' Shopping Satisfaction

Retailers have tried to identify factors affecting consumers' shopping satisfaction because positive links exist between shopping satisfaction and retail sales performance (Gomez, McLaughlin, & Wittink, 2004), consumer revisit intentions (Darian, Tucci, & Wiman, 2001) and consumer store loyalty (Martenson, 2007). Martineau (1958) introduced the term "store image" as the consumer evaluation of the retailer's total offerings such as store facilities, sales associates, product quality, and price. Consumers' perceptions of these store image attributes affect their evaluation of shopping experiences (Kim & Chen-Yu, 2005), and in turn, the evaluation influences consumers' shopping satisfaction (Ingene, 1984; May, 1989). Consequently, store image attributes are significant determinants of consumers' shopping satisfaction (Pan & Zinkhan, 2006), and this positive link between the two has been empirically supported (Bloemer & Ruyter, 1998; Koo, 2003). In the present study, consumers' shopping satisfaction is measured by their levels of satisfaction with: (1) the decision to purchase products at the store; (2) the shopping experience in the store; (3) the personalized service received from the store; (4) the expectation fulfilled; (5) and post-shopping feelings about the store. As satisfaction is based on the overall evaluation of various attributes affecting consumers while shopping at a store, it is imperative for retailers to identify significant store image attributes that contribute to shopping satisfaction of their own consumers as well as those of competitors.

3. Research Objectives and Questions

Based on the review of previous studies, this research attempts to examine the relationship between consumers' evaluation of store image attributes and their satisfaction while shopping at a store. This research first intends to compare consumers of global discount stores and Chinese discount stores with the following research questions:

RQ1: Which store image attributes significantly predict shopping satisfaction for consumers of global discount stores (Wal-Mart and Carrefour)?

RQ2: Which store image attributes significantly predict shopping satisfaction for consumers of Chinese discount stores (Lianhua and Hualian)?

Then, this research moves forward to compare consumers of global retailers, Wal-Mart and Carrefour, separately. To address this research objective, the following research questions are proposed:

RQ3: Which store image attributes significantly predict shopping satisfaction for consumers of Wal-Mart?

RQ4: Which store image attributes significantly predict shopping satisfaction for consumers of Carrefour?

4. Method

4.1. Sample and Data Collection

A self-administered questionnaire was used for data collection. The questionnaire was first developed in English and then translated into Chinese by a Chinese student who is a bilingual and had been in the U.S. for over three years. The translation process was monitored and assessed by a bilingual Chinese faculty member in the U.S. After the review for the discrepancies between the English-version and the Chinese-version questionnaire and the revision process, the faculty member approved the equivalence in language for the questionnaires.

The data was collected from Chinese consumers residing in Shanghai, China. Two collaborators, who were Chinese and familiar with the purpose and the content of the survey, administered the data collection process. A total of 155 questionnaires were returned from the initial distribution of 326 questionnaires (47.7

per cent return rate). After deleting incomplete returns and handling missing answers with mean scores, 140 questionnaires were retained for data analysis, representing 42.9 per cent of initial distribution. Table 1 summarizes the characteristics of study participants.

Table1. Characteristics of Study Participants

Category	Frequency	% (n=140)
Gender		
Male	54	38.6
Female	86	61.4
Marital Status		
Married	52	37.1
Single	84	60.0
No answer	4	2.9
Age		
Born before 1957	51	36.4
Born after 1967	89	63.6
Education level		
High school or less	36	25.7
College student	43	30.7
Associate or 3-yr college degree	11	7.9
Professional degree	6	4.3
Bachelor's degree or higher	42	30
No answer	2	1.4
Household's monthly income		
Less than $292.00	13	9.7
$292.01 to $585.00	64	47.8
$585.01 to $878.00	38	28.4
$878.01 to $1,463.00	16	11.9
More than $1,463.01	3	2.1
Most frequently visited retailer		
Wal-Mart	42	30
Carrefour	38	27.1
Lianhua Hypermarket	40	28.6
Hualian Ji Mai Seng Hypermarket	20	14.3
Shopping frequency		
Everyday	6	4.3
Once a week	68	48.6
Twice a week	19	13.6
Once a month	47	33.6

4.2. Measurement and Analysis

Based on the review of literature, a total of 20 items related to store image attributes and 5 items for consumer shopping satisfaction were developed (Bloemer & Odekerken-Schroder, 2002; Dodds, Monroe, & Greweal, 1991; Ettenson & Wagner, 1991; Hu, 2002; Joyce & Lambert, 1996; Kim & Jin, 2001; Koo, 2003; Li, 2008; Marks, 1976; Seiders, Voss, Grewal, & Godfrey, 2005). After running a principal component factor analysis with a varimax rotation for items for store image attributes, four items with factor loading lower than 0.50 were excluded and five factors (Eigenvalue > 1) were extracted. They were labeled as "merchandise," "convenience," "sales associates," "store congestion," and "store atmosphere." The five items for consumer shopping satisfaction had factor loadings above .50 and therefore they were all retained. Cronbach

alpha coefficients for each factor showed acceptable reliability, ranging from 0.63 to 0.83. Table 2 illustrates the outcome of factor analyses and reliability tests for store image attributes and shopping satisfaction

Table 2. Factors and Reliability of Store Image Attributes and Shopping Satisfaction

Factor labels and statement	Factor loading	Eigenvalues	Percentage of variance
Convenience (α = .77)		2.555	15.966%
Convenient location	.834		
Convenient transportation	.758		
Convenient hours	.700		
Convenient credit card payment	.677		
Merchandise (α = .77)		2.480	15.499%
A wide choice of apparel products	.795		
Apparel products are fashionable	.737		
A variety of imported merchandise	.681		
A wide choice of Chinese traditional food	.647		
Store Atmosphere (α = .75)		2.103	13.145%
A pleasant place to shop	.846		
Merchandise is displayed in a pleasing manner	.785		
A store is neat	.776		
Sales Associates (α = .75)		1.847	11.541%
Sales associates are pleasant	.836		
Sales associates are helpful	.830		
Store Congestion (α = .63)		1.683	10.521%
Too much time to be checked out	.813		
Too crowded with people	.794		
Shopping Experience Satisfaction (α = .83)		6.778	27.113%
Satisfied with my shopping experiences	.791		
Satisfied with my decision	.714		
Satisfied with personalized service	.688		
Store meets my expectations	.672		
Shopping at this store was a right choice	.669		

Descriptive analysis was used to describe sample characteristics and multiple regressions utilizing SPSS 16.0 were used to address research questions. The mean score of each variable was used for the analysis. First, the data was classified into two groups: consumers of global discount stores, Wal-Mart and Carrefour, and those of Chinese discount stores, Lianhua and Hualian. Then, the first series of multiple regression analyses were performed to identify store image attributes that were significantly related to consumers' shopping satisfaction of each group. The second series of multiple regression analyses were used with consumers of global retailers only. The separate regressions were performed for Wal-Mart consumers and Carrefour consumers.

5. Results

Standard multiple regressions were conducted to determine consumers' shopping satisfaction. All five store image attributes (merchandise, convenience, sales associates, store atmosphere, and store congestion) were entered for the analysis. The regression results for consumers of Chinese discount stores (Lianhua and Hualian) specified that the overall variance explained by these store image attributes was 58.9% (R^2=.589, R^2_{adj}=.551, $F(5,54)$=15.51, p<.001). Only two variables, merchandise and convenience, were positively related to consumers' shopping satisfaction. Among consumers of global discount stores (Wal-Mart and Carrefour), the

regression results indicated that the overall model was significant, R^2=.375, R^2_{adj}=.332, F(5,74)=8.86, p<.001. This model accounts for 37.5% of variance in consumers' shopping satisfaction, with three variables - sales associates, store atmosphere, and store congestion – that significantly and positively contributed to the model.

The next two regression results were based on the data of global discount stores' consumers. For Wal-Mart consumers, two variables, sales associates and store atmosphere, had significant and positive relationships with consumers' shopping satisfaction. The overall model was significant, accounting for 43.9% of variance in consumers' shopping satisfaction (R^2=.43.9, R^2_{adj}=.361, F(5,36)=5.63, p=.001). For Carrefour consumers, two variables (sales associates and store congestion) were significantly and positively related to their shopping satisfaction. The variance explained by these store image attributes was 35.2%, R^2=.352, R^2_{adj}=.251, F(5,32)=3.48, p=.013. The series of multiple regressions indicate that store image attributes affecting consumers' shopping satisfaction vary across different stores. Table 3 presents the regression results.

Table 3. Multiple Regression Results for Store Image Attributes and Shopping Satisfaction

Variable	b	SE b	β	Mean	SD
Chinese retailers (n=60, R^2=.589)					
Merchandise	.38	.10	.44***	2.97	.76
Convenience	.24	.10	.26*	3.63	.70
Global retailers (n=80, R^2=.375)					
Sales associates	.29	.07	.42***	3.28	.72
Store atmosphere	.28	.09	.30**	3.43	.53
Congestion	.13	.06	.22*	3.00	.81
Wal-Mart (n=42, R2=.439)					
Sales associates	.30	.08	.47**	3.12	.67
Store atmosphere	.50	.12	.52***	3.25	.45
Carrefour (n=38, R^2=.352)					
Sales associates	.26	.11	.36*	3.46	.73
Congestion	.22	.10	.33*	3.12	.80

*P < .05, **P < .01, ***P < .001

6. Conclusion and discussions

6.1. Summary of Findings

Global retailers have pursued the Chinese market since its "open-door policy" because of steady economic growth and a large population with a growing middle class. However, the performances of global retailers such as Wal-Mart and Carrefour have not met business expectations (Cui & Lui, 2001; Ness, 1999; Prystay, 1997; Rheem, 1996) and even were bested by Chinese retailers, the discount retailing sector in particular (Uncle & Kwok, 2009). Various studies have suggested the positive association between store image attributes and consumers' shopping satisfaction, which leads to consumers' revisits. Thus, the success of global retailers in the Chinese market depends on their knowledge of store image attributes that contribute to consumers' shopping satisfaction.

The results of this research reveal that global discount stores and Chinese discount stores did not share common store image attributes that are significantly related to their consumers' shopping satisfaction. Sales associates, store atmosphere, and store congestion were significantly related to shopping satisfaction for consumers of global discount stores, Wal-Mart and Carrefour, while merchandise and convenience were important to consumers of Chinese discount stores, Lianhua and Hualian.

Since Lianhua and Hualian have more outlets in comparison to Wal-Mart and Carrefour, increasing convenient accessibility, and many Chinese consumers, especially elderly ones, are still new to "foreign things," consumers may perceive that domestic retailers are a convenient place to shop, which leads to higher shopping satisfaction. In regard to merchandise, the majority of Chinese consumers believe that domestic retailers better meet their needs. Schramm, Spiller, and Staack (2006) surveyed Wuhan residents in China and found that 39.4% of respondents expressed that foreign supermarkets failed to meet their product expectations. The same study also revealed that 62.5% of respondents graded domestic supermarkets superior in product offering, particularly in fresh food items, compared to global supermarkets. Their study concluded that Chinese consumers prefer domestic supermarkets for their grocery shopping (Schramm et al., 2006). Therefore, merchandise, especially Chinese traditional food, may be a significant factor that affects Chinese consumers' shopping satisfaction at domestic supermarkets/ hypermarkets. However, because both apparel products and Chinese traditional food were included in the "merchandise" dimension of store attributes, this study had no power to discriminate which product categories (apparel or Chinese traditional food) influenced Chinese consumers' shopping satisfaction at Chinese domestic retailers.

As mentioned earlier, sales associates, store atmosphere, and store congestion were significantly and positively related to shopping satisfaction among Chinese consumers of global discount stores. One interesting finding is that store congestion has a positive relationship with Chinese consumers' shopping satisfaction. Generally, store crowding and the level of shopping satisfaction have an inverse relationship (Machleit, Eroglu, & Mantel, 2000). However, some studies have suggested the relationship varies by individuals' personality and perceived crowding (Eroglu, Machleit, & Barr, 2005; Machleit et al., 2000). Asians are more likely to be tolerant of crowding compared to Westerners (Gillis, Richard, & Hagan, 1986), and therefore, Chinese consumers may not perceive store congestion negatively. Furthermore, a certain level of human crowding sometimes heightens shoppers' excitement and satisfaction (Eroglu et al., 2005). These findings may explain the positive relationship between store congestion and Chinese consumers' shopping satisfaction. Perceived store congestion also varies by store types (Eroglu et al., 2005; Machleit et al., 2000). Chinese consumers prefer foreign brands due to symbolic values that convey the status of product owners (McEwen, Fang, Zhang, & Burkholder, 2006). Likewise, Chinese consumers may prefer global retailers because shopping at these stores may be viewed as a way to impress others. For example, Schramm et al. (2006) found that pretentious Chinese consumers tend to shop at global retailers. In this sense, having more shoppers at the store helps consumers achieve symbolic values of shopping at global retailers. This could explain why the significant and positive relationship between store congestion and shopping satisfaction may be found at global retailers only.

By examining Wal-Mart and Carrefour individually, consumers of both stores perceive that sales associates are important for their shopping satisfaction. This finding indicates that Wal-Mart and Carrefour appear to hire and train sales associates carefully. Numerous publications have reported that one of the main reasons for global retailers' failure in foreign markets is their lack of understanding local consumers and market systems (e.g., Lam, 1995; Prystray, 1997). Through the lessons from their own failure cases, Wal-Mart and Carrefour may realize the importance of localization and work to achieve it through their employees who are direct contacts with consumers. Besides the importance of sales associates, Wal-Mart consumers' shopping satisfaction is affected by store atmosphere, whereas Carrefour consumers' shopping satisfaction is affected by store congestion.

6.2. Managerial Implications

Consumer perception of store image attributes plays a critical role in store success. Consumers' positive and pleasant shopping experience at a store is likely to increase their store revisit intention, store loyalty and positive word of mouth. Therefore, retailers need to

ensure consumers' shopping satisfaction at their stores. As such, "how to do it?" becomes an important issue. This study was designed to explore this inquiry by expanding an understanding of Chinese consumers' shopping satisfaction. The results indicate that consumers of Wal-Mart, Carrefour and Chinese discount stores are influenced by different store image attributes. Chinese domestic discount stores satisfy their consumers with merchandise and convenience. In contrast, Wal-Mart increases its consumers' shopping satisfaction through sales associates and store atmosphere while Carrefour consumers' shopping satisfaction is affected by sales associates and store congestion. Although the present study considers store congestion and store atmosphere as two different constructs, other studies have used store congestion as a component of store atmosphere. For example, Jin and Kim (2001) considered "spaciousness" as an indicator of store atmosphere. Grewal, Baker, Levy, and Voss (2003) posited that store congestion influences consumers' evaluation of store atmosphere, implying that the two are interrelated. Taking these findings into consideration, consumers of Wal-Mart and Carrefour may have similar expectations toward global retailers' store image attributes. By knowing which store image attributes significantly affect their customers' shopping satisfaction, Wal-Mart and Carrefour can implement more effective marketing strategies that can maximize customers' satisfaction.

The findings of this study suggest that the human factor is crucial to both Wal-Mart and Carrefour. Well-trained and pleasant sales associates may reduce unfamiliar feelings Chinese consumers may perceive while shopping at foreign retailers. Therefore, Wal-Mart and Carrefour should continue to focus on improving the performance of their sales associates through the hiring of the right people and training them. Knowing that the success of global retailers in China depends on their ability to adapt the local consumers and business environment (Wong & Yu, 2003), these sales associates, the initial contact point with Chinese consumers, could help Wal-Mart and Carrefour localize effectively.

The findings also suggest that Wal-Mart and Carrefour should offer psychological satisfaction to their customers. According to Li (1997), Chinese consumers have shifted from seeking physical satisfaction to psychological satisfaction such as services, store atmosphere and social interactions. This tendency may be more apparent among consumers of global retailers considering Chinese consumers' increased interest in seeking symbolic values from "foreign" things (McEwen et al., 2006). Also, for many Chinese consumers, shopping is still a leisure activity in which they seek pleasure (Schramm et al., 2006). This study supports that such attributes enhancing consumers' psychological satisfaction are significant to consumers of global discount stores while merchandise and convenience, functional aspects of store image attributes examined in this study, are important to only consumers of Chinese domestic discount stores. In other words, adequate store crowding, which is sometimes viewed as providing shopping excitement to consumers (Eroglu et al., 2005), and pleasant store ambience may motivate Chinese consumers to shop at global retailers. Therefore, Wal-Mart and Carrefour should focus on fulfilling Chinese consumers' need for psychological satisfaction from shopping.

The level of consumers' shopping satisfaction is determined by the evaluation of store image attributes, and this study attempts to find store image attributes that differ from store to store. Since consumers' shopping satisfaction is based on evaluation of multiple store image attributes, retailers need to focus on improving an overall store image rather than emphasizing one or only a few store image attributes. However, knowing which attributes are more important to their consumers is valuable information for retailers to engage marketing activities that can increase consumers' shopping satisfaction.

6.3. Limitations and Suggestions for Future Research

This study extends understanding regarding store image attributes affecting shopping satisfaction for consumers of Chinese domestic discount stores and global discount stores. However, the findings may not be generalized to all Chinese consumers because the

sample size is too small and comes only from Shanghai, China. Since Chinese consumers' shopping behaviors vary across cities (Wong & Yu, 2003), future research could be developed with larger samples in various cities.

A store's image is multifaceted and some studies have used as many as 21 attributes (Wong & Yu, 2003). The five store image attributes used in this study may not thoroughly explain the relationship between store image attributes and Chinese consumers' shopping satisfaction. For example, this study failed to distinguish which product category (apparel or Chinese traditional food) may have affected shopping satisfaction for consumers of Chinese domestic discount stores and to what extent. Therefore, future research could include more store image attributes so that the findings can be used to gain a greater understanding of Chinese consumers' evaluation of store image attributes and shopping satisfaction, and even further examine how Chinese consumers' shopping satisfaction can lead to their store revisit intention and store loyalty. These findings could help retailers improve their future performance.

References

Arnold, M. J. & Reynolds, K. E. (2003). Hedonic shopping motivations. *Journal of Retailing, 79*(2), 17-36.

Babin, B. J. & Darden, W. R. (1995). Consumer self-regulation in a retail environment. *Journal* of *Retailing, 71*(1), 47-70.

Barboza, D. (2007, February 28). Wal-Mart expands in China as its growth slows in U.S. *New York Times*, p. C10.

Bean, R. (2006). Retail food sector: All China retail annual report. *USDA Foreign Agricultural Service*. Retrieved June 4, 2009, from http://www.fas.usda.gov/gainfiles/200603/146187234.pdf

Bearden, W. O. (1977). Determinant attributes of store patronage: Downtown versus outlying shopping areas. *Journal of Retailing, 53*(2), 15-22.

Berry, J. W., Segall, M. H., & Kagitcibasi, C. (1997). *Handbook of cross-cultural psychology*.Boston: Allyn & Bacon.

Bloemer, J. & de Ruyter, K. (1998). On the relationship between store image, store satisfaction and store loyalty. *European Journal of Marketing, 32*(5/6), 499-513.

Bloemer, J. & Odekerken-Schroder, G. (2002). Store satisfaction and store loyalty explained by customer and store-related factors. *Journal of Consumer Satisfaction & Complaining Behaviors, 15*, 68-80.

Brunn, S. D. (2006). Wal-Mart world: The world's biggest corporation in the global economy. New York City: Routledge.

Chang, L. (2004). China's consumers put product quality over price. Wall Street Journal, p. A7.

China to become second-largest retail market by 2012 (2008, June 30). The China Supply Chain Council. Retrieved May 13, 2009, from http://www.supplychain.cn/en/art/2502/

Cui, G. & Liu, Q. (2001). Executive insights: Emerging market segments in a transitional economy: A study of urban consumers in China. *Journal of International Marketing, 9*(1), 84-106.

Darian, J. C., Tucci, L. A., & Wiman, A. R. (2001). Perceived salesperson service attributes and retail patronage intentions. *International Journal of Retail & Distribution Management, 29*(4/5), 205-123.

Dodds, W., Monroe, K., & Grewal, D. (1991). Effects of price, brand, and store information on buyer's product evaluations. *Journal of Marketing Research, 28*(3), 307-319.

Doyle, P. & Fenwick, I. (1974). How store image affects shopping habits in grocery chains. *Journal of Retailing, 50*(4), 39-52.

Egri, C. P., & Ralston, D. A. (2004). Generation cohorts and personal values: A comparision of China and the United States. *Organization Science, 15*(2), 210-220.

Erdem, O., Oumlil, A. B., & Tuncalp, S. (1999). Consumer values and the importance of store attributes. *International Journal of Retail & Distribution Management, 27*(4), 137-144.

Eroglu, S. A., Machleit, K., & Barr, T. F. (2005). Perceived retail crowding and shopping satisfaction: The role of shopping values. *Journal of Retailing, 58*, 1146-1153.

Ettenson, R. & Wagner, J. (1991). Chinese vs. US consumer behavior: A cross-cultural comparison of the evaluation of retail stores. *Journal of International Consumer Marketing, 3*(3), 55-71.

Fernandes, M., Gadi, C., Khanna, A., Mitra, P., & Narayanswamy, S. (2000), "Indian retailing comes of age", *McKinsey Quarterly, 40*, 95-102.

Fong, M. (2009, January 22). Retailers still expanding in China. *The Wall Street Journal*. Retrieved June 1, 2009, from http://global.factiva.com

Garner, J. (2005). The rise of the Chinese consumer: Theory and evidence. Chichester, UK:Credit Suisse First Boston and Wiley.

Gillis, A. R., Richard, M. A., & Hagan, J. (1986). Ethnic susceptibility to crowding: An empirical analysis. *Environment and Behavior, 18*(November), 683-706.

Goldman, A. (2000). Supermarkets in China: The case of Shanghai. *International Review of Retail, Distribution & Consumer Research, 10*(1), 1-22.

Gomez, I. M., McLaughlin, W. E., & Wittink, R. D. (2004). Customer satisfaction and retail sales performance: An empirical investigation. *Journal of Retailing, 80*(4), 265-278.

Grewal, D., Baker, J., Levy, M., & Voss, G. B. (2003). The effects of wait expectations and store evaluations on patronage intentions in service-intensive retail stores. *Journal of Retailing, 79*(4), 259-268.

Griffin, M., Babin, B. J., & Modianos, D. (2000). Shopping values of Russian consumers: The impact of habituation in a developing economy. *Journal of Retailing, 76*(1), 33-52.

Hofstede, G. (1991). Culture and organizations: Software of the mind. London: McGraw-Hill Book Company.

Hu, H. (2002). A cross-cultural examination of consumer's perception of store image. Doctoral dissertation, University of Wisconsin-Madison, Wisconsin, U.S.A. Retrieved June 15, 2009, from ProQuest Digital Dissertation (AAT 3060503).

Hutcheson, G. D. & Moutinho, L. (1998). Measuring preferred store satisfaction using consumer choice criteria as a mediating factor. *Journal of Marketing Management, 14*(7), 705-720.

Ingene, C. (1984). Productivity and functional shifting in spatial retailing: Private and social

perspectives. *Journal of Retailing, 60*(3), 15-36.

Jin, B., & Kim, J.-O. (2001). Discount store retailing in Korea: Shopping excitement, shopping motives, and store attributes. *Journal of Global Marketing, 15*(2), 81-107.

Joyce, M. L. & Lambert, D. R. (1996). Memories of the way stores were and retail store image. *International Journal of Retail & Distribution Management, 24*(1), 24-33.

Kahle, L. R. (1986). The nine nations of North America and the value basis of geographic segmentations. *Journal of Marketing, 50*, 37-47.

Kim, S.-H. & Chen-Yu, J. (2005). Discount store patronage: A comparison between South Korea and the United States. *Clothing & Textile Research Journal, 23*(3), 165-179.

Kim, J. O. & Jin. B. (2001). Korean consumers' patronage of discount stores: Domestic vs multinational discount store shoppers' profiles. *Journal of Consumer Marketing, 18*(3), 236-255.

Koo, D. (2003). Inter-relationships among store images, store satisfaction, and store loyalty among Korea discount retail patrons. *Asia Pacific Journal of Marketing & Logistics, 15*(4), 42-71.

Lam, A. C. (1995). Tapping the retail market in China. *China Business review, 22*(5), 23-28.

Li, C. H. (1997). *China: The consumer revolution*. Singapore: Wiley.

Li, Y. (2008). Chinese consumer's evaluation of multinational and domestic discount store image and store satisfaction. Master thesis, Oklahoma State University, Stillwater, OK, USA.

Li, D. & Gallup, A. M. (1995). In search of the Chinese consumer. *China Business Review, 22*(5), 19-23.

Lianhua supermarket announces 2008 annual results (2009, March 31). *Reuters.* Retrieved June 1, 2009, from www.reuters.com

Lindquist, J. D. (1974). Meaning of image: Survey of empirical and hypothetical evidence. *Journal of Retailing, 50*(4), 29-38.

Lo, T. W. C., Lau, H. F., & Lin, G. S. (2001). Problems and prospects of supermarkets in China. *International Journal of Retail & Distribution Management, 29*(2), 66-75.

Machleit, K. A., Eroglu, S. A., & Mantel, S. P. (2000). Perceived retail crowding and shopping satisfaction: What modifies this relationship? *Journal of Consumer Psychology, 9*(1), 29-42.

Mai, L. W. & Zhao, H. (2004). The characteristics of supermarket shoppers in Beijing. *International Journal of Retail & Distribution Management, 32*(1), 56-62.

Marks, R. D. (1976). Operationalising the concept of store image. *Journal of Retailing, 52*(3), 37-46.

Martenson, R. (2007). Corporate brand image, satisfaction and store loyalty: A study of the store as a brand, store brands and manufacturer brands. *International Journal of Retail &* Distribution Management, 35(7),

Martineau, P. (1958). The personality of the retail store. *Harvard Business Review, 48*, 47-55.

Mattila, A. S. & Enz, C. A. (2002). The role of emotions in service encounters. *Journal of Service Research, 4*(4), 268-277.

May, E. G. (1989). A retail odyssey. *Journal of Retailing, 65*(3), 356-367.

McEwen, W., Fang, X., Zhang, C., & Burkholder, R. (2006). Inside the mind of the Chinese consumer. *Harvard Business Review, 84*(3), 68-76.

Mitchell, V.-W. (2001). Re-conceptualizing consumer store image processing using perceived risk. *Journal of Business Research, 54*, 167-172.

Miu, A. & Penhirin, J. (2003). Hypergrowth for China's hypermarkets. *McKinsey Quarterly, 2,* 14.

Moreau, R. (2008). Carrefour and Wal-Mart's differing expansion strategies in China. *Euromonitor International: Retail Digest, Spring*, 42-45.

National Bureau of Statistics of China (2004). *China Statistical Yearbook 2004*. Beijing, China: China Statistical Press.

National Bureau of Statistics of China (2006). *China Statistical Yearbook 2006*. Beijing, China: China Statistical Press.

Ness, A. (1999). Retail space to let. *China Business Review, 26*(3), 44-49.

Pan, Y. & Zinkhan, G. (2006). Determinants of retail patronage: A meta-analytical perspective. *Journal of Retailing, 82*(3), 229-243.

Prystay, C. (1997). Reduced to clear. *Asian Business, 33*(2), 42-45.

Rheem, H. (1996). International investing: Who profits in China? *Harvard Business Review, 74*(1), 10-11.

Samli, A. C. (1998). *Strategic marketing for success in retailing*. Westport, CT: Quorum Books.

Samli, A. C., Kelly, J. P., & Hunt, H. K. (1998). Improving the retail performance by contrasting management- and customer-perceived store images: A diagnostic tool for corrective action. *Journal of Business Research, 43*, 27-38.

Schmitt, B. (1997). Who is the Chinese consumer? Segmentation in the People's Republic of China. European Management Journal, 15(2), 191-194.

Schramm, M., Spiller, A., & Staack, T. (2006). Attitudes of Chinese consumers towards retail formats. *European Association of Agricultural Economists Seminar*. Retrieved June 23, 2009, from http:// ageconsearch.umn.edu/bitstream/10034/1/sp06sc07. pdf

Seiders, K., Voss, G., Grewal, D., & Godfrey, A. (2005). Do satisfied customer buy more? Examining moderating influences in a retailing context. *Journal of Marketing, 69*, 26-43.

Shi, S. & Yang, A. S. (1998). Retail roundabout. *China Business Review, 25*(1), 43-49.

Shim, S., & Eastlick, M. (1998). The hierarchical influence of personal values on mall shopping attitudes and behavior. *Journal of Retailing, 74*(1), 139-160.

Stewart, T. A. (1997, July 21). A satisfied customer isn't enough. *Fortune*, 112-113.

Tai, S. H. C. (2008). Relationship between the personal values and shopping orientation of Chinese consumers. *Asia Pacific Journal of Marketing & Logistics, 20*(4), 381-395.

Theodoridis, P. K. & Chatzipanagiotou, K. C. (2009). Store image attributes and customer satisfaction across different customer profiles within the supermarket sector in Greece. *European Journal of Marketing, 43*(5/6), 708-734.

Uncles, M. D. & Kwok, S. (2008). Generalizing patterns of store-type patronage: An analysis across major Chinese cities. *International Review of Retail, Distribution & Consumer Research, 18*(5), 473-493.

Wang, C.-L., Siu, N. Y. M., & Hui, A. S. Y. (2004). Consumer decision-making styles on domestic and imported brand clothing. *European Journal of Marketing, 38*(1/2), 239-252.

Wong, G. K. M. & Yu, L. (2003). Consumers' perception of store image of joint venture shopping centres: First-tier versus second-tier cities in China. *Journal of Retailing & Consumer Services, 10*, 61-70.

Zeithaml, V. A. (1988). Consumer perceptions of price, quality, and value: A means-end model and synthesis of evidence. *Journal of Marketing, 52*, 2-22.

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The Role of Bandwagon and Snob Effects in Student Demand for Binge Drinking in College

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ABSTRACT

Although binge drinking among college students in the United states remains a considerable concern to government and public health officials, the issue has received much less attention in economic literature. This paper therefore uses tools introduced by statistical mechanics to develop a theoretical model for, and empirically illustrate, the study of the interaction processes in college students' demand for binge drinking. With the focus on bandwagon and snob effects, this paper shows that statistical mechanics methods can provide a simple but yet unifying framework for understanding the importance of collective interdependence among economic actors in the emergence of complex aggregate behavior such as college binge drinking. The results also show that the bandwagon effect and the snob effect can be used through targeted policy planning to effectively reduce the economic and health burden of college binge drinking in the US.

1. Introduction

There is a considerable interest in economics in models with social interactions, which allow for interdependencies not mediated by markets between individual behavior and the behavior and characteristics of other individuals within a given neighborhood, or reference group. A large and growing literature suggests an individual's choice is influenced by the choices of friends and neighbors (Case and Katz, 1991; Topa, 2001; Brock and Durlauf, 2001). In order to characterize the outcomes of interaction processes, economists have formalized mathematical models of agent behavior. Cowan et al. (1997), for example, developed a model of demand with interactions among consumers recognizing three reference groups for a consumer. A peer group with whom the individual desires to share consumption activities, one or several contrast group(s) with which the individual seeks to distinguish himself, and an aspirational group with which the individual would like to share consumption activities but cannot. Because of the difficulties inherent in the analysis of social interactions, the empirical literature has lagged behind in the treatment of the topic.

There are , however, numerous reasons to think that interactions matter for health-related behaviors such as binge drinking, which is defined to be the consumption of five or more drinks in a row for men and four or more drinks for women on one or more occasions during the two-week period immediately before the survey (Wechsler and Nelson, 2008). The

college environment is one of the most dynamic social settings in which complex social interactions take place. A typical student forges his college experience, emulating reference group lifestyles and behaviors. Each student has a different college experience depending on which group(s) the student chooses as reference and/or contrast group(s). Regardless however of chosen reference group(s), high levels of alcohol consumption stereotypically characterize the college student's lifestyle (Perkins, 2002). Specific high-risk groups within universities, such as athletic teams, fraternities and sororities, have also been identified to drink more often and more heavily than their peers (Kilmer, Larimer, Parks, Dimeff and Marlatt, 1999; DeSimone, 2007).

The aim of this paper is to contribute to the understanding of the binge drinking phenomenon among college students, focusing on the importance of social interactions. Moreover, by using tools introduced by statistical mechanics inspired models of socioeconomic phenomena, this paper specifically investigates the existence of the bandwagon effect and/or the Snob effect, and their influences on students' preferences and attitudes towards alcohol consumption. Because of the negative health and developmental consequences, college students drinking behavior remains of considerable concern to public health officials (Frone, 1999; Perkins, 2002; Stewart et al., 2002). As such, the potential existence and magnitude of the bandwagon effect and/or the snob effect in students' alcohol consumption behavior is of particular interest for policy purposes. The bandwagon effect may serve to amplify the effects of interventions. Consider, for example, the introduction of an alcohol free policy on a college campus; a direct effect is that the policy reduces the availability of alcohol for the typical student on campus, potentially making the student consume less alcohol. However the restriction also applies to the student's peers, so a fraction of peers consuming alcohol will decline. If the bandwagon effect is important, this may make each student increasingly less likely to consume alcohol. The snob effect can as well be of great policy use. College groups with lifestyles prone to high alcohol consumption can be presented to incoming students as contrast groups rather than potential peer groups, promoting then dissociation rather than association of students with those groups.

The outline of the remaining sections of the paper is as follows. In Section 2 the motivation for the study is presented. Section 3 contains the theoretical development of the binge drinking model with bandwagon and snob effects. Section 4 considers the data and empirical strategy used for the analysis, and section 5 presents the results. Finally, conclusions and discussions are presented in section 6.

2. Motivation

The concept of Bandwagon, Snob, and Veblen Effects were first introduced in the theory of consumers' demand by Leibenstein (1950), to describe the desire of some consumers to be "in-style," the attempts by others to attain exclusiveness, and the phenomena of conspicuous consumption. Leibenstein classified the demand for consumers' goods and services according to motivation into "functional demand" and "non-functional demand". Most of the analysis on consumer demand in the economic literature has focused on the functional demand, partly because of the difficulty inherent in analyzing the complex interactions present in non-functional demand. The bandwagon and snob effects investigated in the current paper fall in the non-functional category of demand. More formally, the bandwagon effect represents the desire of individuals to purchase a commodity in order to conform to the people they wish to be associated with in order to be stylish or fashionable (Leibenstein, 1950). It refers to the extent to which individuals increase their consumption of a commodity because others are also consuming the same commodity. The snob effect, on the other hand, represents the opposite effect. Individuals want to dissociate themselves from the masses, and so decrease their consumption of a commodity because others are also consuming it. These two effects, as Leibenstein shows, forge

individuals' tastes and preference for goods and services.

There are a number of reasons one might expect to see these two types of social interactions in students' binge drinking behavior. A first reason is that drinking is a social activity and as such is more fun to do when others also indulge in the same behavior. If one's friends like to drink in bars, the returns from going to bars then rises. A second reason to expect social interactions in students' demand for binge drinking is that beliefs may themselves be formed through social learning. Ellison and Fudenberg (1993), for example, suggested a social learning model in which people infer truth from the behavior of others. A student may not know whether binge drinking is good or bad, but might be able to get guidance by watching others believed to have more information. In such settings, the presence of friends and neighbors who drink will provide evidence about the benefits of the activity, while the absence of drinking peers will be taken to mean that there is something wrong with doing so. Also, because of cognitive dissonance, students that binge drink are likely to articulate the view that binge drinking is pleasurable or not harmful. These views may then be transmitted in conversation and perhaps persuade some peers that alcohol is less harmful. The power of these views will depend, of course, on the extent to which other messages about the benefits and harms of alcohol are being regularly broadcast.

The importance of reference groups to which the student as a consumer can orient consumption behavior was long recognized by Hayakawa and Venieris (1977), suggesting that student affiliations are important determinants of initiating binge drinking in college (Weitzman et al., 2003). For example, membership in fraternities or sororities, a belief that most friends binge drink, drinking to "fit-in", low cost of alcohol , easy access to alcohol through social affiliation and attending a college with a high rate of binge drinking were all identified to play a major role in students' adoption of binge drinking in college (Wechler and Nelson 2008). With such perceived significance of social interactions, it is reasonable to postulate the existence of the bandwagon effect and/or the snob effect in students' demand for binge drinking in college. This paper provides an important contribution to the economic literature by making use of tools introduced by statistical mechanics to develop a theoretical framework for, and empirically illustrate, the study of aggregate behavior of students facing interdependent binary choices. With the focus on the bandwagon and snob effects, this paper shows how statistical mechanics methods can provide a simple and unifying framework for understanding the importance of collective interdependence among economic actors in the emergence of complex aggregate behavior such as college students' binge drinking.

3. The Model

Early works on the use of statistical mechanics and statistical physics inspired models in the study of socioeconomic phenomena include respectively (Blume, 1995; Glaeser, Brock & Durlauf, 2001; Bell, 2002) and (Weidlich, 1991, 2002; Stauffer D., Sousa A.O., Oliveira S., 2000; GonZalez-Avella J.C et al., 2006). The model of social interaction developed here is adapted from the Blume (1995) best-response strategy revision. Each individual make choices according to his/her neighborhood configuration. Each site on the 2-dimensional integer lattice Z^2 is the address of one individual. There is a symmetric neighborhood relation $\sim$, where $\alpha \sim \beta$ means that α and β are neighbors. The neighbors of site k are a set $V_k = \{\alpha : \alpha \sim \mathrm{K}\}$. The neighborhood relationship is translation-invariant, that is $\alpha \sim \beta$ if and only if $\alpha - \beta \in V_k$. The translation invariance of the neighborhood relation implies that V_k is symmetric to reflection through the origin. The set of neighbors of α is denoted V_α. The neighborhood relation is represented by a graph whose vertices are the sites in Z^2 and whose edges connect neighbors. The set of interacting individuals is taken to be $B(N)^2 = [-N, N)^2$, the cube with side-length 2N centered at the origin in Z^2. Individuals choose actions from the

set $W = \{0,1\}$. A configuration η is a map η: $Z^2 \rightarrow W$ which specifies what action each individual is choosing. When the set of interacting agents is $B(N)^2$, a configuration will be the map η: $B(N)^2 \rightarrow W$. The choice of individual α in configuration ψ is $\psi(\alpha)$, and the choice of all individuals other than α is denoted $\psi(-\alpha)$. An individual who has chosen an action ω receives a payoff flow from each of his neighbors determined by ω and by each neighbor's choice of action. She receives instantaneous utility $U(\omega, \nu)$ from a given neighbor if she chooses action ω while that neighbor chooses action ν. Her instantaneous utility received from choosing ω is the sum of the instantaneous payoffs received from choosing ω against each of her neighbors. The total Utility flow to individual α from choosing $\omega \in W$ when the choice of the population is described by the configuration ψ is $\sum_{\beta \in V_k} U(\omega, \psi(\beta))$.

A best-response strategy revision process is a continuous time Markov process on the space of configurations which describes the evolution of individuals' choices through time. The process works as follows. Each individual has an I.I.D. (independent and identically distributed) Poisson "alarm clock" which goes off at randomly chosen moments (exponentially distributed with mean 1). When it does, the individual responds to his neighbors' current configuration by choosing an action which maximizes his instantaneous utility $\sum_{\beta \in V_k} U(\omega, \psi(\beta))$. On each $B(N)$ there is an open and dense set of matrices for which the hypothesis will be true for all possible neighborhoods V_k in the plane Z^2. The choice behavior described here is boundedly rational. Configurations in which individuals make choices to maximize subjective utility given the choices made by neighbors are of special importance. Whether a student adopts binge drinking is determined by the consumption behavior of the reference group(s) he chooses to emulate, as well as the attractiveness of alcohol consumption itself.

The social interactions (Bandwagon effect and Snob effect) investigated in the context of students' demand for binge drinking, are analyzed in a discrete choice framework. In fact, it is assumed that the phenomena of binge drinking is formed by an individual's discrete choice, and is formulated as the binary logit model. In the context of the random utility theory with social interactions, each discrete choice has a utility, and an individual reacts to his neighborhood configuration by choosing the alternative that has the maximum utility. The utility represents the attractiveness of the chosen alternative, and in the random utility theory it incorporates randomness. The individual is assumed to maximize his (random) utility through the choice of a course of action from the choice set $W = \{0,1\}$ which has two alternatives. Assume that alternative 1 is to adopt binge drinking and alternative 0 is not to adopt it. Each alternative has the utility (U_0 and U_1 for the alternative 0 and 1 respectively). When U_1 is larger than U_0 alternative 1 is adopted, that is, binge drinking is adopted. The utility is formulated as

(1) $U_\omega = V_\omega + \varepsilon_\omega$, $\omega = 0$ or 1,

where V_ω is a deterministic component of the utility and ε_ω is a random term. Each random term is assumed to follow a Gumbel distribution, whose mean is 0, and is I.I.D.

The probability of adopting binge drinking is derived as follows:

(2a) $P_1 = \Pr[V_1 + \varepsilon_1 > V_0 + \varepsilon_0]$,

(2b) $= \Pr[\varepsilon_1 = \eta, \varepsilon_0 < \eta + V_1 - V_0]$, $-\infty < \eta < +\infty$,

(2c) $= \Pr[\varepsilon_1 = \eta] \Pr[\varepsilon_0 < \eta + V_1 - V_0]$, $-\infty < \eta < +\infty$,

Incorporating the probability distribution of the Gumbel distribution, $\mathrm{F}(x) = \exp[-\exp(-x)]$, and its derivative $\mathrm{F}'(x) = \exp[-\exp(-x) + x\}]$, with Eq. (2c), P_1 and P_0 can be calculated as follows:

(3a) $P_1 = \int_{-\infty}^{+\infty} F'(\eta) \, . F(\eta + V_1 - V_0) \, d\eta$,

(3b) $P_1 = \frac{1}{1+\exp(V_0 - V_1)}$,

(3c) $P_1 = \frac{\exp(V_1)}{\exp(V_1)+\exp(V_0)}$,

(4) $P_0 \equiv 1 - P_1 = \frac{\exp(V_0)}{\exp(V_1)+\exp(V_0)}$.

Individuals make decisions considering the generalized cost for adopting binge drinking, and the rate at which others binge drink. The generalized cost includes the economic and health costs minus the attractiveness of alcohol drinking itself. The deterministic utility from adopting binge drinking can be formulated as

(5) $V_1 = -(EC + HC - A) + \gamma z(1-z)^{\lambda}$,

where γ, λ are constant parameters ($\gamma \geq 0, \lambda \geq 0$) and EC, HC, A represent respectively the economic cost, the health cost and the attractiveness of alcohol as a consumption commodity ($-\infty < EC + HC - A < +\infty$). z is the rate of adoption of binge drinking among the students ($0 \leq z \leq 1$). The adoption rate z within a specific college is calculated as the number of students adopting binge drinking within the college divided by the entire student body in the college. Eq. (5) can also be analyzed at the group level, distinguishing different groups' impact on group members' binge drinking choices. In this case, z represents the adoption rate among group members, and is equal to the number of student members who binge drink within the group divided by the total number of group members. Numerically, z and P_1 are equivalent, and as such can be used interchangeably. The binge drinking equation (Eq. (5)) can be understood as follows. The deterministic component of the utility from adopting binge drinking is proportional to the number of those who adopt it (bandwagon effect) and the number of remaining people as diminished by 1 - z (snob effect). Note that the parameter λ is introduced for the relative strength of the snob effect to the bandwagon effect. The parameter γ represents the strength of the social interactions.

If we further assume that the utility of not adopting drinking is 0 ($V_0 = 0$), that is assuming the individual is subject to a group's sanctions if he decides not to binge drink. The sanctions are such that there is no utility or attractiveness when not adopting drinking. The utility difference ($V_0 - V_1 \equiv -V_1$) then becomes $(EC + HC - A) - \gamma z(1-z)^{\lambda}$. Let z_t denote the adoption rate at time t. Each individual decides whether she adopts binge drinking by considering the adoption rate in the previous period and the generalized cost. The dynamical system of college students' rate of binge drinking adoption is

(6) $z_{t+1} \equiv g(z_t) = \frac{1}{1+\exp[(EC+HC-A)-\gamma z_t(1-z_t)^{\lambda}]}$.

The model takes the generalized cost of binge drinking as well as the bandwagon effect (conformity) and the snob effect (differentiation) into account. The model shows that the rate of adoption of binge drinking among students is expected to increase monotonically, if only the bandwagon effect prevails ($\lambda \to 0$). On the other hand, the rate of adoption is expected to decrease monotonically if no bandwagon effect exists ($\lambda \to 1$). When both the bandwagon and the snob effects exist in students' demand for binge drinking, we may observe cyclicality in the rate of adoption overtime. Which outcome prevails depends on the generalized cost from binge drinking as well as the strength of the bandwagon effect and the snob effect.

4. Data and Empirical Strategy

4.1. Empirical Method

With the general form of the utility function for each individual in the sample described by Eq. (1), the utility U_{iw} of an individual i from choosing the alternative w is not observable. What we observe, however, is the decision w_i, which is worth 1 if individual i adopts binge drinking in college and 0 if the individual does not. A rational consumer is assumed to choose the alternative that provides him with the greatest utility. McFadden (1974) proves that the probability that student i chooses alternative 1 is:

(6) $Prob[w_i = 1] = \Lambda(\boldsymbol{X_i'\beta}) = \frac{e^{X_i'\beta}}{1+e^{X_i'\beta}}$

This would be the reduced form for the binomial logit model, where the $\boldsymbol{X_i'}$ row vector of explanatory variables for the i-th individual contains the independent or explanatory variables representing the economic costs (direct or explicit, and implicit or

opportunity costs), the health costs, the attractiveness of alcohol; it also contains variables of social interaction and group membership. It is assumed that the non-observed ε's follow a distribution of logistic probability, with the Λ of the logit model denoting the cumulative standard logistic probability distribution function.

The binomial logit model (BLM) is chosen to carry out the analysis because of the inherent nonlinearities involved in the model of social interactions describing the students' choice behavior. In observance of the difficulty in interpreting the results of the BLM, Myoung (2004) presented an extensive discussion of a SAS/IML program based on the SPost module of STATA developed by J. Scott Long (1997). The current paper makes use of the effective interpretation methods and follow-up analysis presented in Myoung (2004). The major follow-up analyses include predicted probabilities, marginal changes, discrete changes, and changes in odds.

The predicted probabilities are computed as follows, where hat signs represent estimated values.

(7) $\hat{P}(w=1) = \Lambda\left(\boldsymbol{X_i'}\hat{\boldsymbol{\beta}}\right) = \frac{e^{x_i'\hat{\beta}}}{\mathbf{1}+e^{x_i'\hat{\beta}}}$

The marginal changes are computed by taking the first partial derivative with respect to corresponding independent variables, with k representing the number of parameter in the model:

(8) $\frac{\partial\Lambda(\boldsymbol{X_i'\beta})}{\partial x_k} = \frac{e^{x_i'\beta}}{1+e^{x_i'\beta}}\beta_k = \Lambda(\boldsymbol{X_i'\beta})[\mathbf{1} - \Lambda(\boldsymbol{X_i'\beta})]\beta_k$

The discrete changes are computed as,

(9) $\frac{\partial\Lambda(\boldsymbol{X_i'\beta})}{\partial x_k} = P(w=1|X, X_k+\delta) - P(w=1|X, X_k)$

The factor changes in odds are obtained by taking the exponential of the logit equation. The factor change in odds of X_k is as follows, where δ is chosen to be one or the standard deviation of the independent variable.

(10) $\ln\Omega(X, X_k+\delta) - \ln\Omega(X, X_k) = \frac{\Omega(X,X_k+\delta)}{\Omega(X,X_k)} = e^{\beta_k\delta}$

4.2. Data Source And Variables Presentation

This study draws on data from the 2001 Harvard School of Public Health College Alcohol Study (CAS), an anonymous self-report mailed survey that has been administered on four occasions during the 1993-2001 period, to a nationally representative sample of American college students. Originally administered in 1993 at 140 four year colleges and universities, out of the 149 initially selected for participation, 128 of those which participated were again surveyed in 1997 and 1999. Details regarding sampling selection and survey administration are provided by Wechler et al. (1994). Data from 2001 are available for 119 of the 120 sampled colleges, 113 of which were included in the 1993, 1997 and 1999 data, and six of which are new. The total sample size of the original survey in 2001 was 10,904. This value was reduced after selection of the variables to be used in the analysis and dropping the observations with missing information on the explanatory variables, because the SAS/IML program used to curry the econometric analysis requires no missing information in the matrix of covariates.

The data contains rich enough information about each student on both drinking choices and about those explanatory variables that influence students' demand for binge drinking. Protocols of the 2001 national survey on which this research is based were reviewed and approved by the HSPH Office of Human Subjects Research. With the aim of analyzing the existence of the bandwagon and Snob effects on students' demand for binge drinking in college, the model of choice uses a sample restricted only to students who adopted the behavior in college and those that do not currently binge in college. Excluded from the sample are individuals that binged in high school and are still in college. This restriction allows us to isolate the college environment as a closed system with endogenous processes among which the binge drinking phenomenon is analyzed in the mixed processes within the realm. The focus is predominantly on the factors that lead to the adoption of the binge drinking behavior exclusively in college.

In this situation, for each individual i, the dependent variable can only take two values: $w_i = \{1, 0\}$ depending on whether the individual chooses the first alternative or the second. This would be the dichotomous dependent variable of our BLM of college binge drinking: $w_i = 1$ if the individual adopts binge drinking in college, and $w_i = 0$ if the student does not adopt the behavior in college. Descriptive statistics for the explanatory variables of the model are presented in Table 1, and the variables have been regrouped in six categories and presented below.

4.2.1. Variables of Personal and Psychological Characteristics

AGE: The age of the student respondent; it is a continuous variable and coded as (18, 19, 20 etc).

MALE: Takes a value of 1 if the respondent is male and 0 in the case the respondent is a female.

Table **1.** Descriptive Statistics of Main Variables

Parameter	Obs.	Mean	Std. Dev	Min	Max
Binge	6609	0.3945	0.4888	0	1
Age	6609	20.9089	2.0450	17	25
Male	6609	0.3468	0.4760	0	1
Renforcep	6609	2.7213	1.2662	1	5
Easyob	6609	3.6493	0.6152	1	5
LikeTast	6609	2.9617	0.9570	1	4
Everyod	6609	3.6039	0.6617	1	4
Cheap	6609	3.7951	0.5425	1	4
Frdnod	6609	3.4511	0.8346	1	4
Badhlt	6609	2.6807	1.0927	1	4
Lsatats	6609	1.7372	0.7524	1	4
Fathalc	6609	4.0206	1.4518	1	8
Mothalc	6609	3.4949	1.2291	1	8
Memgreek	6609	0.1239	0.3295	0	1
Athlete	6609	0.1372	0.3441	0	1
F30frnd	6609	0.2722	0.4451	0	1

LSATATS: Measures how satisfied the student is in general with his life at school. Takes values from 1 to 4 depending on whether the student is very satisfied, or very dissatisfied.

4.2.2. Generalized Cost of Alcohol

EASYOB: Measures how easy it is for students to obtain alcohol. It is used to represent the implicit or opportunity cost of alcohol usage by the respondent. It takes values from 1 to 4 depending on whether the student finds it very difficult, or very easy to obtain alcohol.

CHEAP: Measures the importance of low direct cost of alcohol acquisition on the student's decision to engage in alcohol drinking. It takes values from 1 to 4 depending on whether the student finds a cheap alcohol price to be a very important reason to engage in alcohol drinking or not important at all.

BADHLT: Measures the importance of the perceived adverse health impact of alcohol consumption on the individual decision to reduce or not consume alcohol. It takes the values from 1 to 4 depending on whether the student finds the adverse health impact of alcohol consumption to be a very important reason not to drink or to limit his drinking behavior, or if the student finds it not important at all.

LIKETAST: Measures the importance of alcohol taste as an attractive feature on the student's decision to engage in alcohol drinking. It takes values from 1 to 4 depending whether the student finds alcohol taste very important or not at all important in his decision to engage in drinking.

4.2.3. Variables of Social Interactions

EVERYOD: Measures the importance of everyone else's drinking behaviors' impact on the student decision to engage in binge drinking. It is used to capture the interaction effect in binge drinking. It takes values from 1 to 4 depending on whether the student finds it very important to engage in binge drinking because everyone else on campus is drinking or not important at all.

FRDNOD: Measures the importance of the fact that the student's friends don't drink alcohol on the student's decision to reduce or not consume alcohol. It is also used to capture interdependencies in students' binge drinking, and takes values from 1 to 4 depending whether the student finds the fact that his friends don't drink to be a very important reason not to drink or limit his drinking behavior, or the student finds it not important at all.

F30FRND: Takes the value 1 if less than 30 percent of the student friends binge drink and 0 otherwise.

4.2.4. Variables of Family Alcohol Consumption Background

FATHALC: Describes the alcohol consumption behavior of the father or the person who served as a father to the respondent during most of the time the student was growing up. It takes the value 1 if not applicable, a value of 2 if abstainer, 3 if abstainer in recovery, 4 if infrequent drinker, 5 if moderate drinker, 6 if heavy drinker, and 7 if problem drinker.

MOTHALC: Describes the alcohol consumption behavior of the mother or the person who served as a mother to the respondent during most of the time the student was growing up. The values taken are the same as those of FATHALC.

4.2.5. Variables of Group Membership

The following two groups have been identified with a high prevalence of binge drinking (Wechler and Nelson, 2008; DeSimone, 2007; Kilmer, Larimer, Parks, Dimeff and Marlatt, 1999).

ATHLETE: Takes a value of 1 if the student plays or practice collegiate sports and a value of 0 in the case the student is not a college athlete.

MEMGREEK: Takes a value of 1 if the student is member of a fraternity or sorority and a value of 0 in the case the student is not member of a Greek house.

4.2.6. Policy Variable

RENFORCEP: Measures the student's perception of the strength of reinforcement of his school alcohol policy. It takes values from 1 to 5 depending on whether school alcohol policy is strongly enforced or if the student doesn't know the policy.

5. Results

The results of the estimation by the maximum likelihood of the logit model, which allows us to analyze the influence of the bandwagon and/or snob effects on the probability of adopting binge drinking in college, are included in Table 2. In order to analyze the factors that predominantly influence college binge drinking, two models are estimated for comparison and sensitivity analysis. Model 1 uses an unrestricted sample containing students that do not binge drink in college, and students that binge drink regardless of student high school binge drinking choices. In Model 2 the sample is restricted to exclude students who binged in high school and carry on the drinking behavior in college, focusing only on students that don't binge drink at all, and students that adopted the behavior in college. The two models, considered overall, are significant, as are the majority of the independents variables included. Likewise, the predictive capabilities of the models, measured by the percentage of successes, are 74.8% and 72.8% respectively. The likelihood ratio and Wald test statistics suggest both models fit the data well as evidenced by their statistical significance at the 1 percent level.

Table 2. Binomial Logit Models of Students Demand for Binge Drinking in College

Parameter		Model 1 Estimator	(S.D.)	Model 2 Estimator	(S.D.)
Constant		4.6964***	(0.3780)	4.0306***	(0.4181)
Age		-0.0897***	(0.0129)	-0.0637***	(0.0145)
Male		0.0791	(0.0528)	0.1535***	(0.0592)
Renforcep		-0.1664***	(0.0198)	-0.1523***	(0.0227)
Easyob		0.2089***	(0.0426)	0.1552***	(0.0474)
LikeTast		-0.4213***	(0.0264)	-0.3542***	(0.0294)
Everyod		-0.3687***	(0.0399)	-0.3391***	(0.0438)
Cheap		-0.6625***	(0.0545)	-0.6231***	(0.0591)
Frdnod		0.2717***	(0.0330)	0.1857***	(0.0368)
Badhlt		0.3039***	(0.0242)	0.2664***	(0.0272)
Lsatats		-0.1552***	(0.0329)	-0.1848***	(0.0375)
Fathalc		0.0124	(0.0180)	-0.0140	(0.0205)
Mothalc		0.0678***	(0.0213)	0.0300	(0.0242)
Memgreek		0.6361***	(0.0747)	0.6499***	(0.0821)
Athlete		0.3343***	(0.0718)	0.3318***	(0.0797)
F30frnd		0.1552***	(0.0547)	0.1623***	(0.0615)
Likelihood Ratio		1680.9989***		1057.9097***	
Wald		1246.3143***		829.4253***	
McFadden's R2		0.1438		0.1193	
Frequency	Yes (1)	4448		2607	
	No (0)	4002		4002	
Overall Predicted		74.8%		72.8%	
Sample size		8450		6609	

Note: Model 1 uses the unrestricted sample which contains students that don't drink, and students that binge drink in college regardless of high school binge drinking behavior.
Model 2 uses the restricted sample and excludes students with binge drinking behavioral persistence that is, students that binged in high school and are still binging in college.
* indicates significance at the 10% level
* *indicates significance at the 5% level
* **indicates significance at the 1% level

Comparing parameter estimates across the two models, the magnitude of the effects are reduced for the majority of the variables in Model 2, suggesting the coefficients in Model 1 contains carry over effects from pre-college influence on students' binge drinking choices in college, and therefore in Model 1 the effects of the included covariates on the probability of binge drinking, attributable to the college environment, are inflated (overestimated). Notice that in Model 1, when carry over effects are not excluded, mother's alcohol consumption has a significant positive impact on the probability of the student adopting binge drinking in college. However, mother's drinking behavior has no statistical significance when students adopt the behavior for the first time in college. Moreover, the data suggests that father's drinking behavior has no significant effect on the probability of adopting binge drinking in college when both restricted and unrestricted samples are used. These observations imply that a student's high school drinking choices may be explained by the mother's drinking behavior, and also that students may carry high school drinking behavior as a habit to college. However, for students that make it past high school without binge drinking, the decision to engage in college binge drinking seems to no longer to be affected by parental alcohol consumption. These results also strengthen the importance of the sample restriction as a mean of isolating and measuring

unique college environmental factors effects on the drinking behavior.

Model 2 is the chosen model of preference because it allows us to eliminate students' binge drinking background effects, and focus instead on unique effects from factors within the campus environment that triggers the drinking behavior once students arrive in college. This is very important because, after high school, especially in the US, parental control and supervision over students' actions decreases as they move away from home to attend college. Also, the problem of potential self-selection bias in group membership is reduced because students in the restricted sample are less likely to have prior binge drinking preference that might have guided their choices of group membership in college. Instead, preferences and tastes for binge drinking, if any, are assumed to be formed within the college environment.

Estimated effects of the variables of personal and psychological characteristics suggest as age increases, students are less likely to engage in binge drinking; also, students are less likely to be problem drinkers since a decrease in the level of life satisfaction at school is not associated with a greater likelihood of college binge drinking. Also, males seem to be more likely to binge drink than females. Looking at coefficient estimates of the generalized cost for adopting binge drinking, it can be noted that the lower the opportunity cost of alcohol consumption, that is the easier it is for a student to obtain alcohol, the more likely the student is to binge drink in college. Considering the direct cost of consumption, the lesser the student sensitivity to cheap alcohol price, the less likely the student is to engage in college binge drinking. When considering the health cost of alcohol consumption, however, a student is more likely to binge drink, the lesser his perception of the importance of alcohol adverse health effects. Moreover, as student perception of the attractiveness of alcohol as a consumption commodity decreases, the likelihood of the student to engage in college binge drinking also decreases.

The variables of social interactions suggest that a student is less likely to binge drink as the degree of influence from others drinking behavior on the student's decision to also engage in binge drinking decreases. This suggests the less the influence a typical student gets from others, the less likely he is to engage in binge drinking. Conversely the more influence the student has from others, the more likely the student is to engage in college binge drinking. Analyzing student reaction to friends' abstinence behavior shows that the less important a student considers friends' alcohol abstinence on self-decision to refrain from binging, the more likely the student is to engage in college binge drinking.

Analysis of the variables of family alcohol consumption background suggests they have no significant effect on the student decision to engage in binge drinking for the first time in college. On the other hand, the selected variables of group membership suggest that membership in a fraternity/sorority or college athletics is associated with a greater likelihood of binge drinking in college, which confirms the results of past literature. Finally, the policy variable suggests that the lesser student's knowledge about school alcohol policy, the less likely the student is to engage in college binge drinking; this may be as well that students that don't drink do not bother to get acquainted with their school alcohol policy, while those that drink are more familiar with the rules which they perceive to be strict. Although the results of Table 2 show the estimated coefficients of the logit model and their statistical significance, they do not directly show the effects of changes in the variables on the probability of adopting binge drinking in college.

The marginal effects presented in Table 3 show the effects of small changes in the variables on the probability of college binge drinking. These are the derivatives of the probability with respect to each of the explanatory variables, calculated at the mean values of the explanatory variables. The mean values are presented in Table 1. The marginal effects are more appropriate for continuous variables, and vary depending on the values of the independent variable

in question and that of other independent variables. From Table 3, a one unit increase in student age from its mean value decreases the probability of college binge drinking by 1.59 percent, holding all the other variables constant. Marginal changes are not, however, appropriate for interpreting the impacts of binary independent variables; in this case the discrete changes which are also presented in Table 3 are more appropriate. The discrete changes tell us how much

Table 3. Marginal Changes and Discrete Changes

Parameter	0→1	-1/2→1/2	-sd/2 →sd/2	Marginal
Age	-0.0111	-0.0159	-0.0325	-0.0159
Renforcep	-0.0379	-0.0380	-0.0481	-0.0380
Easyob	0.0360	0.0387	0.0238	0.0388
LikeTast	-0.0754	-0.0882	-0.0844	-0.0885
Everyod	-0.0670	-0.0845	-0.0560	-0.0847
Cheap	-0.0664	-0.1544	-0.0842	-0.1556
Frdnod	0.0423	0.0463	0.0387	0.0464
Badhlt	0.0601	0.0664	0.0726	0.0665
Lsatats	-0.0459	-0.0461	-0.0347	-0.0461
Fathalc	-0.0035	-0.0035	-0.0051	-0.0035
Mothalc	0.0074	0.0075	0.0092	0.0075
Male	0.0384			
Memgreek	0.1598			
Athlete	0.0827			
F30frnd	0.0405			

Baseline: mean values, except for binary variables for which baseline value = 0.

predicted probabilities change with changes in the dependents variables from their mean values. A male student is about 3.84 percent more likely to binge drink than a female holding all other variables constant. Similarly, if a student is member of a fraternity or sorority, his probability of binge drinking in college is about 0.16 greater than non-Greek students. Also, student athletes have a probability of college binge drinking that is 0.0827 greater than non-athletes, holding all the other variables constant.

Column 3 in Table 3 also provides information about the impact of changes in the variables of social interaction on the probability of college binge drinking. It suggests that a standard deviation change in the importance of others drinking behavior (Everyod) on self-drinking behavior, centered around its mean, decreases the probability of binge drinking in college by 5.6 percent, holding other variables at their current values. Similarly, a standard deviation change in student's responsiveness to friends' abstinence of alcohol consumption (Frdnd), as a reason to refrain from college binge drinking, centered around its mean, will increase the probability of college binge drinking by 3.87 percent, holding the effects of all other variables constant.

Discrete changes in the generalized cost for binge drinking, which include direct and indirect economic costs, health cost, and the intrinsic attractiveness of alcohol as a consumption commodity providing direct utility, are also presented in column 3 of Table 3. A standard deviation change in the opportunity cost of alcohol (ease of alcohol acquisition), centered around its mean, will increase the probability of binge drinking by 2.38 percent, holding other variables at their given values. Similarly, a standard deviation change in a student's sensitivity to cheap alcohol price (Cheap) as a reason to binge drink, centered around its mean, will decrease the probability of binge drinking in college by 8.42 percent. Moreover, a standard deviation change in the student's responsiveness to alcohol adverse health effects (badhlt) as a reason for not adopting college binge

drinking, centered around its mean, will increase the probability of college binge drinking by 7.26 percent, holding other variables at their given values.

Unlike marginal or discrete changes, factor changes in odds do not depend on the chosen baseline values of the independent variables, but only on the magnitude of the change in the variables. The odds are computed by taking the exponential of the logit equation. As presented in Table 4, a standard deviation increase in the student age decreases the odds of binge drinking by a factor of 0.878, Whereas being male increases ones odds of college binge drinking by a factor of 1.166, holding all other variables constant. Considering the variables of social interaction, a standard deviation decrease in the influence of others drinking behavior on one's binge drinking choice decreases the odds of college binge drinking by a factor of 0.799. Also, for a standard deviation decrease in students' sensitivity to friends' abstinence of alcohol consumption as a

Table 4. Odds Ratio Changes

Parameter	Estimate	e^{β_k}	$e^{\beta_k SD_k}$	S. D. of IV
Age	-0.0637***	0.9383	0.8779	2.0450
Renforcep	-0.1523***	0.8587	0.8246	1.2662
Easyob	0.1552***	1.1679	1.1002	0.6152
LikeTast	-0.3542***	0.7018	0.7125	0.9570
Everyod	-0.3391***	0.7124	0.7990	0.6617
Cheap	-0.6231***	0.5362	0.7132	0.5425
Frdnod	0.1857***	1.2040	1.1676	0.8346
Badhlt	0.2664***	1.3053	1.3380	1.0927
Lsatats	-0.1848***	0.8313	0.8702	0.7524
Fathalc	-0.0140	0.9861	0.9798	1.4518
Mothalc	0.0300	1.0304	1.0375	1.2291
Male	0.1535***	1.1660		
Memgreek	0.6499***	1.9154		
Athlete	0.3318***	1.3935		
F30frnd	0.1623***	1.1762		

precursor for self-abstinence, the odds of college binge drinking increase by a factor of 1.168, holding all other variables constant. The variables of group membership also suggest that being a Greek member or student athlete increases the odds of college binge drinking respectively by a factor of 1.915 and 1.394, holding all other variables constant.

6. Discussion and Conclusion

In economics, as in other social sciences, various theories have been put forward to explain individual demand for alcohol consumption. Most economic models, however, focus predominantly on the costs (explicit and implicit) and benefits of alcohol consumption as the primary determinants of demand. Although this might be the case for most commodities, alcohol consumption is intrinsically social in nature, and a great amount of the variation in individual demand for alcohol consumption can be explained by social interactions.

In the current paper, the binomial logit model estimate explains the binge drinking choices of students in the context of social interactions (bandwagon and snob effects). The variables of social interactions show that a student is less likely to binge drink as the degree of influence from others drinking behavior on the student's decision to also engage in binge drinking decreases, suggesting the less alcohol

influence a typical student gets from others the less likely he is to engage in binge drinking, and vice versa. In other words, stronger social interactions create more conformity of drinking behavior (bandwagon effect) among students because individuals perceive the behavior as socially acceptable; while differentiation (snob effect) is predominant, the weaker the strength of social interactions. Since an individual student is more susceptible to direct peers than overall drinking norm on campus, affiliations are very important in initiating college binge drinking. This observation is validated by the analysis of students' reaction to friends' abstinence behavior, which shows that when students perceive friends' alcohol abstinence to be unimportant, they are more likely to engage in binge drinking.

Since a typical student, over the course of his college career, seeks membership in various groups with differing alcohol culture, it is a great challenge to disentangle individual group effects on the student's probability of binge drinking. Groups' cohesion and alcohol culture, however, define the adoption rate among group members, and as such determine whether the bandwagon effect or the snob effect dominates. Policies intended to decrease the demand for binge drinking among college students should therefore target group level actions rather than just the individual level. Focusing mainly on high prevalence groups such as fraternity and sororities, and breaking the binge drinking culture among those groups, the bandwagon effect within such groups will fuel the effectiveness of the policy by decreasing binge drinking among group members. The snob effect, encountered predominantly in non-alcohol prone groups, should also be nurtured, and active membership in such groups promoted among students.

References

Bell, A. (2002). Dynamically Interdependent Preferences in a General Equilibrium Environment. *Journal of Economic Behavior and Organization, 47*, 309-333.

Blume L. E. (1995) The statistical Mechanics of Best-Response Strategy Revision. *Journal of Games and Economics Behavior, 11*(2), 111-145.

Brock W. A. & Durlauf S. N. (2001). Discrete Choice with Social Interactions. *The Review of Economic Studies*, *68*(2), 235-260.

Cartwright, D. (1968). The nature of group cohesiveness, In D. Cartwright & A. Zander (Eds.) Group dynamics: Research and theory (3rd ed., pp. 91-109). NY: Harper & Row.

Case A. C. & Katz L. F. (1991). The company you keep: The Effects of Family and Neighborhood On Disadvantaged Youths, NBER working Paper No. 3705.

Cowan R., Cowan W., & Swann P. (1997). A Model of Demand with Interactions among Consumers. *International Journal of Industrial Organization*, *15*(6): 711-732.

DeSimone J. S. (2007). Fraternity Membership and drinking behavior, NBER Working Paper N0. W13262. Available at SSRN: http://ssrn.com/abstract=1000364.

Ellison G. & Fudenberg D. (1993). Rules of Thumb for Social Learning. *Journal of Political Economy*, *111*(4), 765-784.

Frone M. R. 1999, "Work Stress and Alcohol Use," *Alcohol Research and Health,* 23: 284-291.

Glaeser, E., B. Sacerdote & J. Schenikman. (1996). Crime and Social Interactions. *Quarterly Journal of Economics*, *111*(2), 507-548.

GonZalez-Avella J. C., Eguiluz V. M., Cosenza M. G. Klemm K., Herrera J. L., & San Miguel M. (2006). Local versus global interactions in non equilibrium transitions: a model of Social Dynamics. *Physical Review*, E 73, 046119 (2006) [7 pages].

Kilmer J., Larimer M., Parks G., Dimeff L., & Marlatt G. (1999). Liability management or risk management? Evaluation of Greek system alcohol policy. *Psychology of Addictive Behaviors*, *13*, 269-278.

Kremer M. & Levy D. (2008). Peer Effects and Alcohol Use among College students. *Journal of economic Perspectives, 22*(3), 189-206.

Leibenstein, H. (1950). Bandwagon, Snob and Veblen Effects in the Theory of Consumer's Demand. *The Quarterly Journal of Economics, 64*(2), 183-207.

Long, S. J. (1997). Regression Models for Categorical and Limited Dependent Variables: Advanced Quantitative Techniques in the Social Sciences. Sage Publications.

Park H. Myoung. (2004). Presenting the Binary Logit/Probit Models Using SAS/IML, Proceedings of the 15th Midwest SAS Users Group Conference in Chicago, IL, Available at http://www.masil.org/documents/Binary_Logit.pdf

Perkins H. (2002). Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of studies on Alcohol*, *14*, 91-100.

Stauffer D., Sousa A. O., & Oliveira S. (2000). Generalization to Square Lattice of SZNAJD Sociophysics Model. *International Journal of Modern Physics* C, *11*(6), 1239-1245.

Stewart S. H., Zvolensky, M. J., & Eifert G. H. (2002). The relations of anxiety sensitivity, experiential avoidance and alexihymic coping to young adults' motivations for drinking. *Behavior Modification*, *26*, 274-296.

Topa G. (2001). Social interactions, local spillovers and unemployment. *Review of Economic Studies*, *68*(2), 261-295.

Venieris Y. & Hayakawa H. (1977). Consumer interdependence via Reference groups. *The Journal of Political Economy*, *85*(3), 599-616.

Wechler H., Davemport A., Dowdall G., Moeykens B., & Castillo S. (1994). Health and Behavioral Consequences of Binge Drinking in College. JAMA, 272(21), 1672-1677.

Wechler H. & Nelson T. F. (2008). What we have learned from the Harvard School of Public Health College Alcohol Study: Focusing Attention on College Student Alcohol Consumption and the Environmental Conditions That Promote It. *Journal of Studies on Alcohol and Drugs*, 481-490.

Weidlich W. (1991). Physics and Social Science: The approach to Synergetics. *Physics Reports*, *204*, 1-163.

Weidlich W. (2002). Sociodynamics: A Systematic Approach to Mathematical Modeling in the Social Sciences *NONLINEAR PHENOMENA IN COMPLEX SYSTEMS An interdisciplinary Journal, 5*(4): 479-487.

Weitzman E. R., Folkman A., Folkman K. L., & Wechsler, H. (2003). The relationship of alcohol outlet density to heavy and frequent drinking and drinking-related problems among college students at eight universities, Health Place, 9, 1-6.

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Economic Indicator Research Using Reuters: Analyzing Hospitality Trends

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ABSTRACT

The possibility to predict economic peaks and downturns is always attractive to business people because of the opportunity to make wise decisions and rationalize investments. This paper applies the concept of environmental scanning to find out those economic indices that are most relevant and important for managers to keep an eye on for proper business decisions.

The three initial indicators that were determined for the analyses are Gross Domestic Product, Personal Income, and Unemployment Rate. These indicators are used as dependent variables to be correlated to both the Dow Jones US Food and Beverage Index and to Dow Jones US Hotel Index. Furthering the notion of examining indicators, the study proceeds to examine the three initial indicators in relation to two corporations, Darden Restaurants and Marriott International. The study was conducted utilizing Reuters 3000X. The results indicate the importance of developing strategic methods forecasting the Industry's paralleled relationship to the economic cyclical path.

1. Introduction

The success of a hospitality leader tomorrow depends on how well management identifies and properly aligns strategic methods today. This article conveys insight on hospitality management through the utilization of Reuters as a business environmental scanning technique. It is hospitality management's obligation to identify value-adding opportunities, where developing strategic methods are essential to remain competitive. This article illustrates trends in a number of key economic indices that affect the future performance of the hospitality industry, which management needs to frequently appraise. Identification of key indicators present opportunities and/or threats to the industry's projected growth. This requires hospitality management to develop strategic preparatory methods correlated to cyclical economic movements. Furthering the notion of key indicators, this technologically related forecasting strategy corresponds to the environmental scanning phases of the Strategic Management Model (Figure 1).

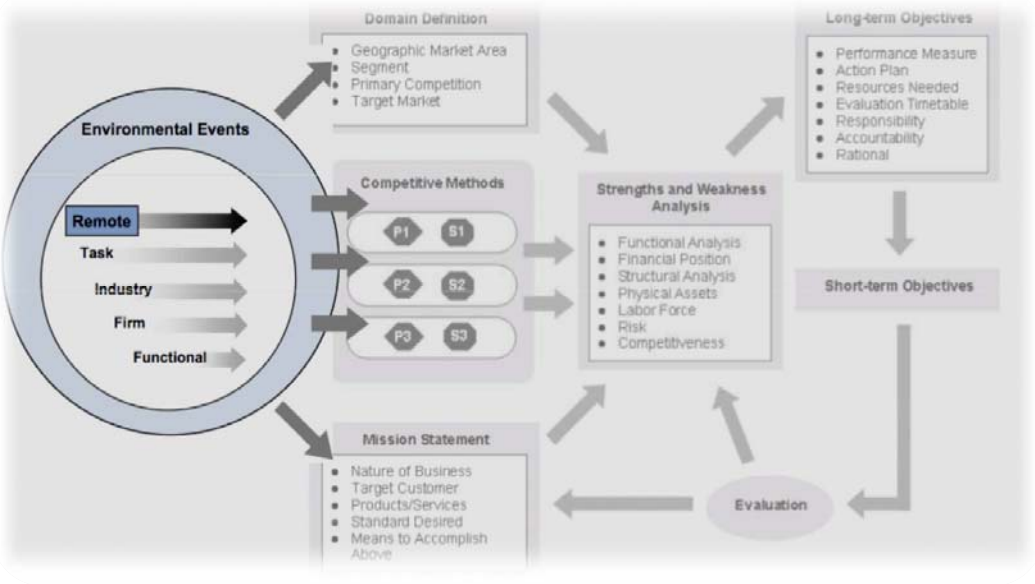

Figure 1. The Environmental Scanning Phases of the Strategic Management Model.

Olsen, Michael D., West, Joseph J., Tse, Eliza Ching Yick. (2008). *Strategic Management: in the Hospitality Industry*. Upper Saddle River, NJ: Pearson Education, Inc.

2. Literature Review

2.1. Hospitality Industry Cycles

Economic peaks and downturns are always of high interest to business people (Choi, 2003). Those changes in economic activity are also significant for the hospitality industry because they can greatly influence companies' investment decisions and ensure efficient resource allocation. Taking this into consideration, different research studies in the hospitality industry were conducted to build economic models and systems that will enable the identification of leading sectors of the economy, observe and forecast turning points in these sectors and overall economy (Choi, 2003; Choi, Olsen, Kwansa, & Tse, 1999; Wong, & Song, 2006). Based on the research conducted for the 28-year period, the hospitality industry was found to follow economic cycles with the mean duration of the cycle being equal to 7.3 years (Choi et al., 1999). The industry declines sharply after each peak, where "the mean duration of the contraction is about two years (1.7 years) and the mean duration of the expansion is about six years (5.7 years)" (Choi et al., 1999, p. 159). Figure 2 shows the long-term hotel industry cyclical fluctuations.

Figure 2. The Hotel Industry Cycle: Long-Term Cyclical Fluctuation

Note: "P" stands for peak and "T" stands for trough
Choi, J.-G., Olen, M., Kwansa, F., & Tse, E. (1999). Forecasting industry turning points: the US hotel industry cycle model. *Hospitality Management*, 18, p. 165

While the hotel industry cycle was found to have a mean duration of 7.3 years, the general economic cycle mean duration is 4.4 years, which means that "the growth cycle fluctuates about twice while the industry cycle fluctuates once" (Choi et al., 1999, p. 169). In other words, this means that the hospitality industry will reach its peak (or beginning of the recession) after the general economy has reached it twice. Researchers also found that "the hotel industry cycle led the general business cycle peaks by about 0.75 years on average and also led at troughs in the general business cycle by roughly 0.5 years" (Choi et al., 1999, p. 168). Based on these facts, the authors came to the conclusion that general business cycles did not provide a clue for the hotel industry cycle.

To approach this issue from a different perspective, other studies were conducted in the hospitality industry (Choi, 2003; Wong, & Song, 2006). Different macroeconomic variables were examined as predictors for changes in the hospitality industry. The leading indicators that were included in the studies are as follows: GDP of service, interest rate variable, consumer-price index (CPI), and money supply. These studies represent "a system of data and procedures designed to monitor, signal, and confirm cyclical changes, especially the turning points" (Choi, 2003, p. 148).

2.2. Scanning the Environment as a Strategic Management Tool

"The concept of strategic management refers to the ability of a firm's management to properly align itself with the forces driving change in the environment in which it competes" (Olsen, & West, 2008, p. 3). The concept of strategy suggests that a company is looking for alignment with the forces and events taking place in the environment in order to gain the competitive advantage and ensure high level of company's performance (Olsen, & Roper, 1998).

This process also is also referred to as the co-alignment model. The importance of strategic management is highlighted in numerous research publications (Cetron, DeMicco, & Davies, 2009; Costa, & Teare, 2000; Okumus, 2004; Olsen, 2003; Olsen, & Roper, 1998). The co-alignment model (Figure 3) is

considered an important strategic management tool that ensures companies' success by means of scanning the environment, gaining competitive advantage and building a strategy.

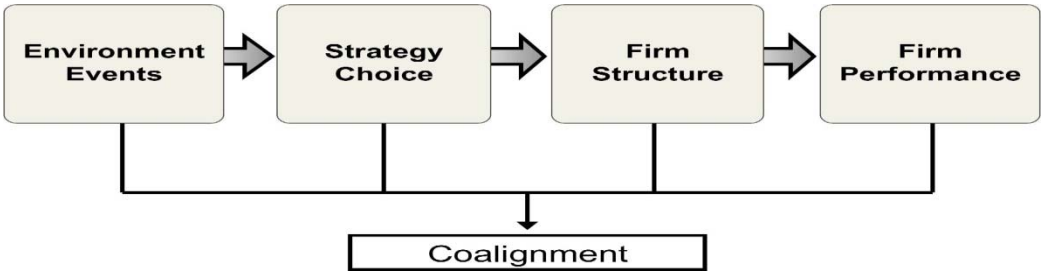

Figure 3. The Co-Alignment Model.

Olsen, Michael D., Joseph J. West (2008). Strategic Management: in the Hospitality Industry. Upper Saddle River, NJ: Pearson Education, Inc.

The first stage of the co-alignment model – environmental scanning – serves as a basis for the whole model. It can be defined as "an approach to gathering relevant information from the external environment and turning it into knowledge that can be widely used in managing hospitality organizations" (Okumus, 2004, p. 124). There are two perspectives on environmental scanning in the literature (Okumus, 2004). On one hand, it is described as a very important managerial activity, but on the other hand it is said to be good on paper but intractable in practice.

A strong correlation was found between firm scanning behavior and performance in the food industry in the United States. However, it is important to notice that this activity requires scanning of an extensive number of variables that makes the whole process very challenging (Olsen, & Roper, 1998). Okumus (2004) states, "more research is needed to investigate how all levels of hospitality organization can best engage in ES [environmental scanning] activities" (p.139). Even though there is still a room for new research in this sphere, existing studies have shown that industry has a strong impact on profitability and a company's performance, and they cannot be disconnected.

In summary, various studies have been conducted to investigate the importance of environmental scanning for the hospitality industry and to try to identify different models and systems for economic forecasts in the industry. The purpose of this study is to tie together the concept of the co-alignment model that starts with environmental scanning and identifies those economic indices that managers should keep an eye on to make efficient strategic decisions.

3. Revealing Hospitality Economic Indicators: Reuters 3000 XTRA

3.1. Hospitality Indicators

Economic indicators are viewed as forecasting variables that can be identified as having a moderate impact on the overall industry. Identifying economic indicators is a system of data and procedures designed to monitor, signal, and confirm cyclical changes, especially turning points, in the economy at large (Choi, 2003). How managers develop their analytical strategies affect the future of their business. Without systematic review of the external environment and properly linking of the external environment to the organization's strategies and structure, there is a minimal probability the benefits will outweigh the fundamental costs. The Reuters 3000 Xtra (Reuters, 2008) application in the confines of the Exelon Trading Center at the University of Delaware allows for

accurate systematic review, which can be formatted to the Hospitality industry, identifying strategic trends as they transpire.

3.2. Exelon Trading Center

"The primary objective of University of Delaware's Exelon Trading Center is to increase the quality of the academic experience with real time hands-on professional applications of the industry. This discovery-based learning facility allows students to stay abreast of the fast-paced world of financial markets" (Alfred Lerner College of Business and Economics, 2009).

3.3. Reuters 3000 Xtra

Reuters 3000 Xtra is a "high-speed, integrated information and transaction service. It gives users a commanding view of the global real-time financial arena and provides a combination of news, information and insight as well as access to the global Reuters trading community. Its integrated price discovery and trading capabilities across all asset classes mean that decisions can be made and executed from a single desktop." The study performed utilizes Reuters 3000 Xtra, which provides a unique skill set of putting economical trend theories into practice for the Hospitality Industry. Reuters is an effective and strategic tool used for analyzing trends in the business environments, in which hospitality environments are examined.

Economic indicators identify forces driving change; if a set of economic indicators change, so will the environment. In terms of how the economic charts were analyzed, this was done with Reuters 3000 Xtra. Designed with a three-step approach, it ultimately provides a wide view of the environmental domains Remote, Task, Industrial Segment, Firm, and Functional.

1. Step One: Identifying trends in terms of sector movements to overall economic position. (.DJUSFB & .DJUSLG & .DJI)
2. Step Two: Correlating market cap of sector (.DJUSFB & .DJUSLG) to economic indicators (GDP, Personal Income, Unemployment Rate)
3. Step Three : Fusing corporate position to economic indicators and competitors.

Although a broad approach, even small incremental changes identified within the environment should be analyzed to prevent future risk. For example, The Parable of the Boiling Frog (Olsen, M.D., Tse, E. 2008) serves as a good metaphor to describe the need for anticipating the future and monitoring change. Expressing that when "a frog is removed from its present domicile, and placed it into a pot of boiling water, its immediate response will be to jump out, in hopes of leaping to safe ground and not another boiling pot. Luckily, most frogs do not find themselves in this dilemma, nor do most managers or businesses. Instead, they often experience environments that change over time. This change often occurs in small increments that in many cases are not even noticed, given little consideration, or perhaps even ignored" (p.63). Ignoring the warming incremental changes of a competitive environment, and similar to the parable frog, firms failing to identify forces driving change can lead to unprofitable situations. However, managers that systematically inspect their environment by identifying forces driving change, understanding the variables making up these forces, and assessing the impact on the organization are prosperous because of anticipating change.

4. Interrelations between .DJUSFB, .DJUSLG, .DJI

In the broader economic climate in which the firm is functioning, the economic environment of interest is the industry cycle (Choi et al., 1999, p. 159). Economic trends and relationships amongst the Dow Jones Industrial Average (Figure 4) can be considered a useful tool for scanning the business environment of emerging economic patterns within the hospitality industry.

Dow Jones Industrial Average is a broad-based but investable measure of the U.S. stock market, intended for use as the basis of investment products. The index aims to consistently represent the top 95% of U.S.

companies based on float-adjusted market capitalization, excluding the very smallest and least-liquid stocks. Available for licensing are the broad Dow Jones U.S. Index as well as sector, size and style sub-indexes. The Dow Jones US Food and Beverage (.DJUSFB) and Dow Jones US Hotel Index (.DJUSLG) evaluate the averages of Food and Beverage Sector and the averages of Hotel Sector respectively. (Dow Jones Indexes, 2009).

Although both The Dow Jones Food and Beverage (.DJUSFB) and Dow Jones US Hotel Index (.DJUSLG) parallel the cyclical movements of the actual DJ Industrial Average; DJ US Hotels seems to stray from the general average when compared to the almost adjoining DJ US Food and Beverage Index. A probable reason for the Hotel Index to stray from the .DJI in similar directions, however, at a larger value, is because during economic booms, business and travel will increase, and vice versa.

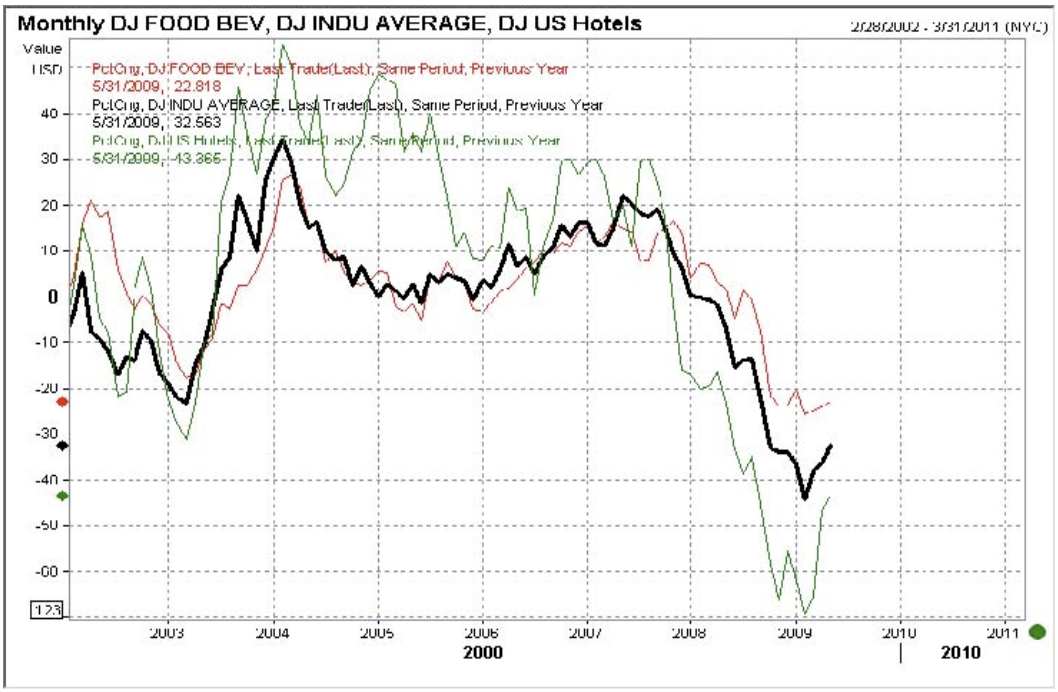

Figure 4. Interrelationship between .DJUSFB, .DJUSLG, .DJI

Conversely, the Dow Jones Food and Beverage Index remains relatively near the average (seemingly unaffected) because people need to eat, even during recessions, but people will consume more from quick service restaurants rather than eat at home.

5. Transposing Market Cap of Sector with Economic Indices

Identifying trends by fusing corporate positions to economic indicators is another strategic approach that can identify multiple opportunities for competitive methods. Visible in both Figure 5 and Figure 6, correlations between each corporation in relation to the dependent variables (Unemployment Rate, GDP, Personal Income, and .DJUSLG for Marriott International & .DJUSFB for Darden Restaurants) provide an awareness of how other corporations are performing within their sectors and any trends.

Gross Domestic Product is the total value of goods and services produced within the borders of the United States, regardless of who owns the assets or the nationality of the labor used in producing that output. In contrast, Gross National Product (GNP) measures the output of the citizens of the US and the income from assets owned by US entities, regardless of where located. The growth of output is measured in real terms, meaning increases in output due to inflation have been removed. The Federal Reserve's primary goal is sustained growth of the economy with full employment and stable prices. Real GDP is the most comprehensive measure of the performance of the U.S. economy. By monitoring trends in the overall growth rate as well as the unemployment rate and the rate of inflation, policy makers are able to assess whether the current stance of monetary policy is consistent with the primary goal. (Economic Indicators, 2009)

Unemployment Rate is the percent of the labor force that is unemployed. The Current Population Survey (CPS) is a monthly survey of households conducted by the Bureau of Census for the Bureau of Labor Statistics. It provides a comprehensive body of data on: labor force, employment, unemployment and persons not in the labor force (Labor Force Statistics, 2009).

Personal Income is income received by a person from all sources. It includes income received from participation in production as well as from government and business transfer payments. It is the sum of compensation of employees (received), supplements to wages and salaries, proprietors' income with inventory valuation adjustment (IVA) and capital consumption adjustment (CCAdj), rental income of persons with CCAdj, personal income receipts on assets, and personal current transfer receipts, less contributions for government social insurance. (Bureau of Economic Analysis, 2009).

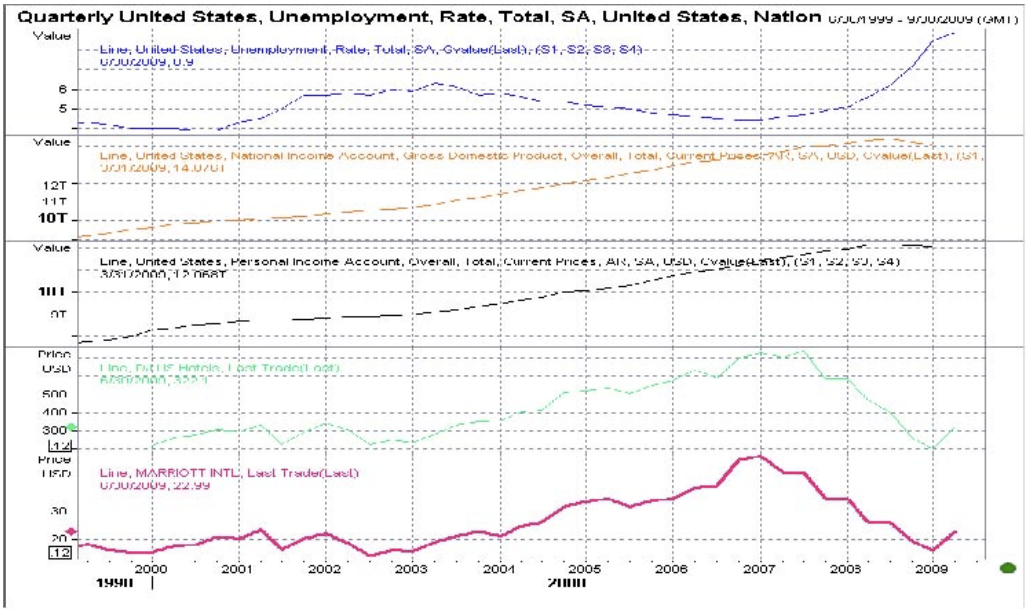

Figure 5. Interrelationship between Unemployment Rate, GDP, Personal Income, .DJUSLG, MAR (Marriott International)

The indictors presented on both graphs define areas that need to be analyzed in a past, present, and projected fashion. Determining the relationship of the past trends with their own provides insight into their present and future standing. For example, having a tendency to maintain dissimilar curves, Marriott International's

relationship with the unemployment rate expresses an inverse relationship. This widespread view explains that when businesses are doing poorly, the amount of unemployed workers will increase.

Figure 6 expresses Darden Restaurants, the leader of casual dining, and more commonly known for their dominant success with Red Lobster and Olive Garden, amongst others; it currently reflects above the .DJUSFB average, which both management of Darden and its competitors should evaluate. There are various reasons for Darden's success, which, if evaluated properly, one may find that its strategic method of mitigating risk is through a multi-branding technique. For example, during an economic downturn, customers may be less willing to eat a fine-dining restaurant such as a Ruth's Chris Steak House, but still drawn to great food at reasonable prices that Darden's casual dining restaurants offer.

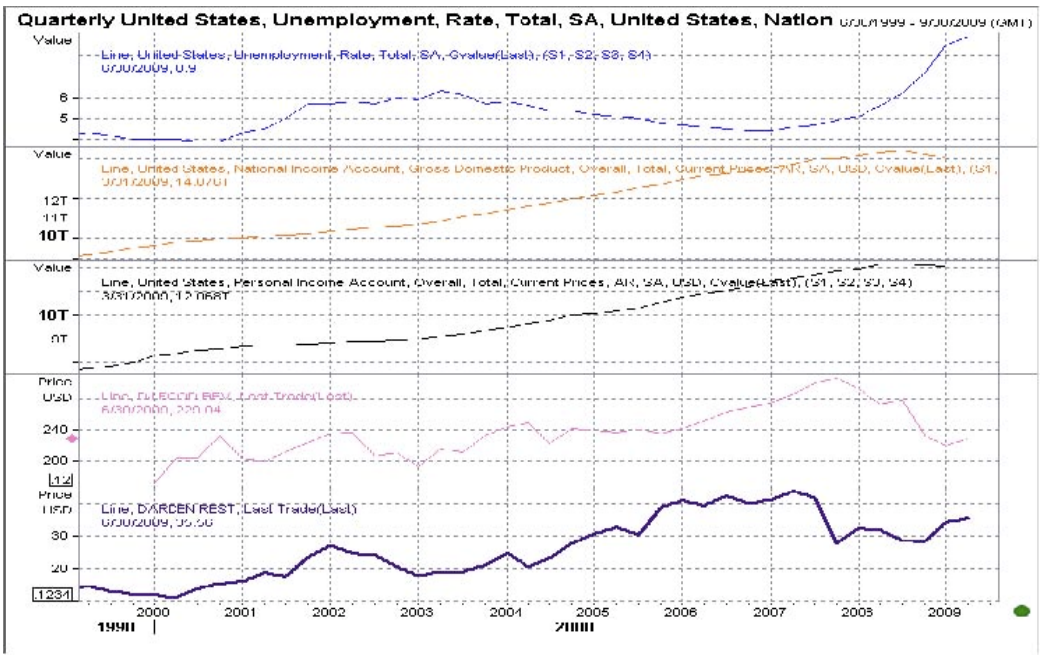

Figure 6. Interrelationship between Unemployment Rate, GDP, Personal Income, .DJUSFB, DRI (Darden restaurants)

Both figures are crucial features to Hospitality Management, generated by Reuters 3000x, and allow management to identify areas for resource allocation. For example, both DRI and MAR are gradually starting to gain momentum and rise with the unemployment rate almost at its pivotal phase if managers can maintain the same retention process and strengthen their marketing budget. Lastly, forecasting provides management with powerful information to cut costs, increase efficient use of resources, and improve their ability to compete within the changing environment (Cranage, 2003).

6. Fusing Corporate Position to Economic Indicators

Firms evaluating competitive firms against their own, yet still maintaining a sense of how the overall industry is performing, can identify needed areas of improvement. The business environment that Starwood Hotels and Marriott International compete in, Figure 7,

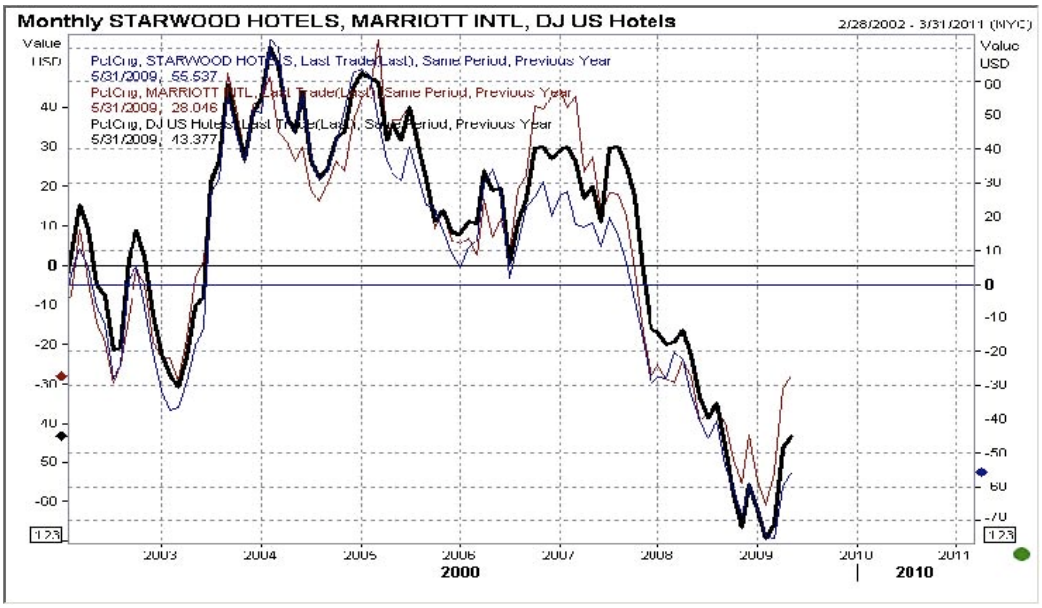

Figure 7. HOT, MAR, .DJUSLG

expresses Marriott International's dominance over Starwood Hotels, or reflects Marriott International's capabilities of understanding its competition. Marriott's ability to deploy strategic methods that identify opportunities and threats within both the long and short-term has successfully guided it to its preferred corporate position.

The same procedure was deployed for the restaurant segment comparing YUM! Brands, Darden Restaurants and Dow Jones Food and Beverage Index.

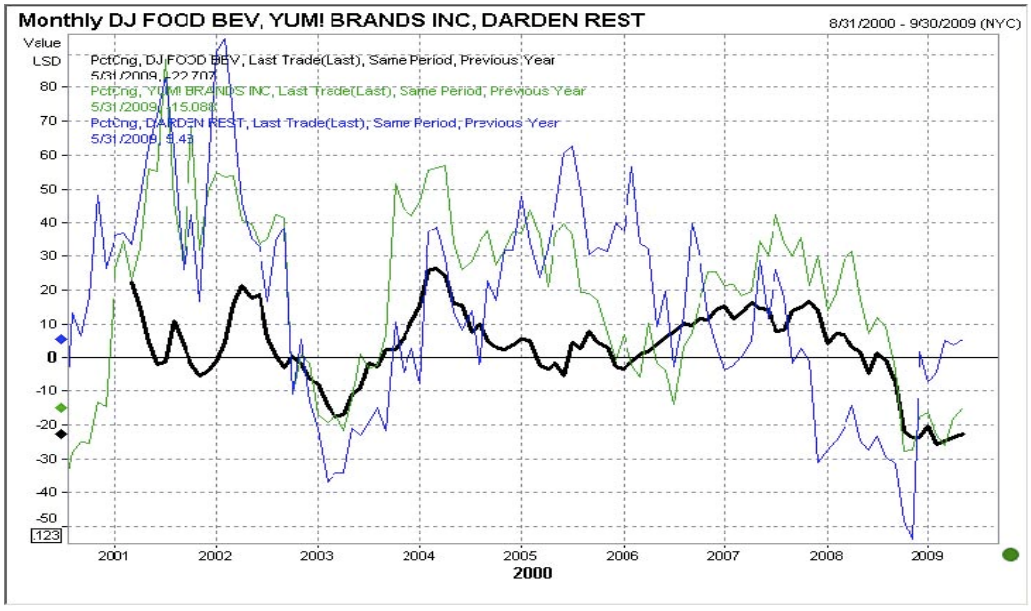

Figure 8. YUM, DRI, .DJUSFB

Figure 8 shows fluctuations of YUM and DRI in relation to .DJUSFB. Looking at this graph we can notice that the peaks and downturns are not always the same for all the indexes, which confirms that a company's performance is case and strategy sensitive.

Further examination of Figure 7 and Figure 8 and consideration of the strategic methods and tasks used, overlooked, and followed through with the Co-alignment Model identifies their competitor's strategy choices (phase two), and firm structure (phase three), developing the final assessment of the firm's performance. Effectively scanning an environment is required throughout the repetitive Co-alignment process, even though the process appears to have a forward strategic motion.

7. Strategic Alignment

For decision-making in terms of forecasting, it is hospitality management's obligation to identify value-adding opportunities, trends, and where developing strategic methods are essential to remain competitive. Management needs to frequently appraise trends in a number of key economic indices that affect the future performance of the hospitality industry. Identification of these key indicators present opportunities and/or threats to the industry's projected growth, which requires hospitality management to develop strategic preparatory methods correlated to cyclical economic movements, ultimately defining the importance of environmental scanning. Strategic planning for a prosperous future reflects upon how well the complex and dynamic environment was scanned.

Identified through trends within the business environment of customers, competitors, suppliers, and regulators of a firm, various threats and opportunities arise routinely. Managers who efficiently scan their business environment will maintain a more prosperous firm in the long run. The Co-alignment Model serves as a tool reflecting the ability of management to properly align with the forces driving change in the environment in which the firm competes. Proper alignment develops competitive gains and advantages, leading to an optimal stance amongst its competitors.

8. Conclusion

Economic indicators have become an area of interest, primarily to identify trends within the environment and optimistically minimizing the firm's risk. By developing a sense of awareness, hospitality management is able to project the industry's growth and its turning points. Reuters 3000Xtra is a sophisticated tool for these purposes. It combines numerous economic indicators and companies' stock information. Using convenient visualizing tools, managers could get a sense of the current conditions and trends in their industries/sectors. The examples used in this paper describe interrelations between hotel/restaurant companies and respective Dow Jones Indexes. Reuters 3000Xtra utilization allowed us to demonstrate the performance of Marriott Hotels in relation to the Starwood company and the Dow Jones US Hotel Index, as well as the current state of Darden restaurants in relation to YUM! Brands and the Dow Jones US Food and Beverage Index. Furthermore, by utilizing Reuter's as an analytical means of scanning a complex and dynamic business environment, hospitality management can strive to maintain a superior competitive performance; without proper strategies and methods of identifying trends, success is not obtainable.

References

Alfred Lerner College of Business & Economics (2009). Exelon Trading Center. Retrieved May 14, 2009, from Exelon Trading Center. Alfred Learner College of Business and Economics. University of Delaware Web site: http://www.lerner.udel.edu/centers/etc

Bureau of Economic Analysis. Glossary. (2009). Retrieved from http://www.bea.gov/glossary/glossary.cfm?letter=P

Cetron, M, DeMicco, F.J., & Davies, O. (2009). Hospitality and Travel 2015. Orlando, FL: AHLA Publishing.

Choi, J.-G. (2003). Developing an economic indicator system (a forecasting technique) for the hotel industry. *Hospitality Management,* 22, 147 – 159.

Choi, J.-G., Olen, M., Kwansa, F., & Tse, E. (1999). Forecasting industry turning points: the US hotel industry cycle model. *Hospitality Management*, 18, 159 – 170.

Costa, J., & Teare, R. (2000). Developing an environmental scanning process in the hotel sector. *International Journal of Contemporary Hospitality Management*, *12* (3), 156.

Cranage, D. (2003). Practical Time Series Forecasting for the Hospitality Manager. *International Journal of Contemporary Hospitality Management*. 15, 86-93.

Dow Jones Indexes. (2009). Retrieved from http://www.djindexes.com

Economic Indicators. Real Gross Domestic Product. (2009). Retrieved from http://www.newyorkfed.org/education/bythe.html

Labor Force Statistics from the Current Population Survey. (2009). http://www.bls.gov/cps/

Okumus, F. (2004). Potential challenges of employing a formal scanning approach in hospitality organizations. *Hospitality Management*, 23, 123 – 143.

Olsen, M. D. (2003). Literature in strategic management in the hospitality industry. *Hospitality Management,* 23, 411 – 424.

Olsen, M. D., & Roper, A. (1998). Research in strategic management in the hospitality industry. *Hospitality Management*, 17, 111 – 124.

Olsen, Michael D., & Joseph J. West (2008). Strategic Management: in the Hospitality Industry. Upper Saddle River, NJ: Pearson Education, Inc.

Thomson, Reuters (2008). Financial Products. Retrieved May 14, 2009, from Reuters - Professional Products - Reuters 3000 Xtra Web site: http://www.about.reuters.com/productinfo/3000xtra/

Wong, K., & Song, K. (2006). Do macroeconomic variables contain any useful information for predicting changes in hospitality. *Journal of Hospitality and Tourism research,* 30 (16).