1982

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PREDICTING PROFIT POTENTIAL

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ABSTRACT

The purpose of the study was to profile the tenpin bowling industry in the continental United States and to examine the relationship between establishment success, expressed as annual operating profit, and selected operational, environmental, and consumptive variables. A random sample of the 3,560 member establishments of the Bowling Proprietors' Association of America was employed. This trade association represents approximately one half of all United States tenpin bowling establishments.

Pearson product-moment correlation and partial correlation analysis were utilized to examine bivariate relationships while stepwise regression was employed for six sample frames in order to develop working equations capable of explaining profit variance. Preliminary equations, coupled with systematic compilation of a reliable data base, represented the first step in development of an accurate forecasting tool for proprietors.

INTRODUCTION

Tenpin bowling has undergone considerable change during the past twenty years. Technology, exemplified by the 1951 development and continuing improvement of the automatic pinsetter/pinspotter, is repsonsible for this activity's appeal to an expanded spectrum of the United States population. Escalated competition for the leisure dollar has resulted in new approaches to the delivery of bowling establishment

services. Although the bowling industry has experienced considerable change along with continued growth, limited data has been publicly compiled and analyzed to document such evolution. An appreciation of the economic magnitude of the bowling industry is obtained when considering Brunswick's (2) 1973 finding that the average league bowler spent $248.00 annually within the bowling center. With over eight million league bowlers in the United States, revenue from league bowlers alone was about $2 billion in 1972. If available, present data would elevate revenues well beyond that mark.

The theoretical framework for the study was based on a contingency model of management which includes operational relevance of factors internal and external to the business establishment (3). The model is geared to situational analyses for both product and service industries. Based upon typology related to the contingency model, coupled with prestudy investigation, 16 internal and external variables were examined in relation to 1975 bowling establishment operating profit. This study's focus on relationships among factors provides a different approach to treatment of bowling establishment management, away from the descriptive emphasis that has often characterized management in general. Although very little similarity exists between the activities of skiing and bowling, the methodology and principles upon which Bein (1) studied factors affecting revenue and profitability among ski operations helped in establishing parameters and selection of variables.

PURPOSE AND PROCEDURE

An objective of the study was to examine relationships between establishment success, characterized by 1975 operating profit, and selected factors representing external considerations along with product-service volumes and other operationally related internal considerations. Included in this effort was development of a limited explanatory model capable of identifying variables having a significant impact upon bowling establishment success.

A representative sample of 260 establishments was drawn from a total roster of 3560 Bowling Proprietors' Association of America (BPAA) members. A response rate of 72 percent was obtained. Due to the delicate nature fo inquiry pertaining to financial success of the establishment and contributing factors, extreme caution was employed in developing the instrument and interviewing proprietors. The procedure for securing data from the sample population was two-fold. Preliminary correspondence included a letter of endorsement from the BPAA, brief description of the study, and a multipage questionnaire to be completed by a specified date and time. The bowling proprietors representing their respective establishments, were informed of a future predetermined telephone interview. The second component of the procedure was the interview itself. The interview, as previously explained to the respondent, was used to collect questionnaire data and allow for further interpretation and open-ended investigation. This procedure is described in detail because of the unique circumstances and procedural relevance for financially related studies of other leisure industries.

RESULTS

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The relationship between external, operational and consumptive independent variables and annual operating profit are expressed in Table 1. Specific models were developed for each of six sample frames, as well as combinations of each of three "variable types" within the sample frames. Multicolinearity resulted in failure of some significant variables to be included in the stepwise regression models.

To demonstrate the appropriateness of this approach, Table 2 depicts significant variables in the model for establishments in general along with data drawn from an establishment demonstrating the following performance breakdown: average annual lineage per lane 10,500; personnel costs - 27 percent; total operating expenses derived from nonbowling services - 42 percent; total league play from mixed couples - 30 percent; and nearest tenpin competitor - 4 miles away (example A). Net operating profit of 16.2 percent was derived from these figures. Example B reflects alternative values. They illustrate the impact that certain changes may have on the establishment's profitability. The proprietor dissatisfied with the profit figure in Example A may attempt to increase his profit level by altering the operations of his establishment. One could project that the proprietor, through an aggressive league promotion campaign, was able to increase annual bowling volume to 11,500 lines per lane while increasing subsidiary revenue two percent to a total of 44 percent. If the three other variables remain unchanged, one could assume an increase in operating profit to 18.4 percent. The proprietor should keep in mind that qualitative factors must remain constant.

Further analysis has led to the development of separate models for owned and leased establishments, and for those providing alcoholic beverage service as well as those who do not. It is hoped that these refinements, coupled with further testing, will provide a practical method for forecasting and improving the productive capabilities of establishments. While the key operating variables identified in the analysis cannot explain all of the variance in profit, the models do help in acquiring a better understanding of "why" some bowling establishments are more successful than others.

IMPLICATIONS

The potential of this model as a planning device and diagnostic tool is apparent. To the proprietor interested in expanding profits, the integration of five significant values into a regression formula can provide important insights regarding the type and amount of changes necessary to achieve this objective.

Utility of the model is highly dependent upon a reliable date base, supported by systematic updating and refinement. Regional or national trade associations are the logical organizations to serve the collective forecasting needs of the small businessman bowling proprietor. Application of this approach to feasibility analysis and profit projection is possible for various leisure industries. Unwillingness to supply sensitive financial information and lack of understanding and confidence in the inferential capabilities of the procedure appear to be the biggest deterrents to expansion of the model to related industries. Costs associated with data collection, analysis, and dissemination, while dependent on the size of the sample frame and degree of precision sought,

are relatively small. Most proprietors were genuinely surprised at the accuracy achieved when incorporating personal data into the model.

REFERENCES

1. D. D. Bein, 1922-23 Annual Ski School Survey, Professional Ski Instructors of America, Denver, Colorado, pp. 1-6, 1974.

2. The Brunswick Corporation, Bowling...A Striking Investment, Brunswick Corporation, Skokie, Illinois, p. 14, 1973.

3. H. M. Carlisle, Situational Management, AMACOM, New York, New York, pp. 18-33, 1973.

TABLE 1

RELATIONSHIP BETWEEN PROFITABILITY AND SELECTED
VARIABLES FOR SIX SAMPLE FRAMES

Variable	In General	With Alcohol	Without Alcohol	Owned	Leased	With Food Service
External						
Establishment Size	.084	.086	.084	.018	.372**	.005
Service Radius Density	.120*	.150*	-.005	.122	.127	.084
Distance From Nearest Competitor	.013	-.044	.110	.043	-.190	.024
Type of Firm (Discrete Variable)	NS					
Region (Discrete Variable)	NS	NS	NS	NS	NS	NS
Operational						
Promotional Expenditure	.479**	.522**	.336*	.433**	.628**	.423**
Personnel Expenditure	-.434**	-.420**	-.502**	-.528	-.157	-.473**
League Lineage, Female	.370**	.426**	.174	.492**	-.055	.345**
League Lineage, Couples	-.012	-.043	.103	.070	-.162	-.057
Hours of Operation	.316**	.372**	.183	.291**	.436**	.251**
Debt Retirement Expenditure				-.459		
Alcohol Availability (Dichotomous Variable)	NS					
Consumptive						
Bowling Volume	.623**	.633**	.644**	.611**	.698**	.601**
Subsidiary Revenue	.391**	.473**	.198	.393**	.353**	.373**
Food Service Revenue						.123
Bar Related Revenue		.410**				

Sig. at the .05 level

Sig. at the .01 level

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TABLE 2

APPLICATION OF PREDICTIVE MODEL FOR
ESTABLISHMENTS IN GENERAL

Independent Variable (X_i)	Coefficient (b_i)	Multiple R^3	Multiple R^2	F
	$b_0 = 2.0063$			
Bowling Volume (X_1)	$b_1 = 0.0020$	.63221	.39969	123.84**
Personnel Expenditure (X_2)	$b_2 = -0.3332$	.68528	.46961	24.39**
Subsidiary Revenue (X_3)	$b_3 = 0.0857$	.70793	.50116	11.64**
League Lineage, Couples (X_4)	$b_4 = -0.0634$	.71579	.51236	4.20**
Distance Nearest Competitor (X_5)	$b_5 = 0.1115$	.72109	.51997	2.89*

*Sig. at the .05 level   Multiple Correlation Coefficient for Significant Variables (R)=.72109

*Sig. at the .01 level   Coefficient of Determination for Significant Variables (R^2) = .51997

Analysis of Variance for the Regression Equation:

df (numerator) = 5

df (denominator) = 182

F value = 2.89

The Regression Equation: $Y = 2.0063 + .0020(X_1) - 0.3332(X_2) + 0.0857(X_3) - 0.0634(X_4) + 0.1155(X_5)$

Example A: Operating Profit (Y) = 2.0063 + .0020 (10,500) - 0.3332 (27%) + 0.0857 (47%)
- 0.0634 (30%) + .1155 (4)   *Predicted Y value = 16.2%

Example B: Operating Profit (Y) = 2.0063 + .0020 (11,500) - 0.3332 (27%) + 0.0857 (44%)
- 0.634 (30%) + .1155 (4)   *Predicted Y value = 18.4%