

**Price Sensitivity for Electronic Entertainment:
Determinants and Consequences**

by

Gunnar J. Clausen

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Price Sensitivity for Electronic Entertainment
Determinants and Consequences

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Preface

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If you are interested in discussing the topic of price sensitivity, pricing, and entertainment further, visit www.priceresearch.com.

Köln, January 2005

Gunnar J. Clausen

For my parents

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List of Abbreviations

AGFI	Adjusted Goodness of Fit Index
CD	Compact Disk
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
DSL	Digital Subscriber Line
DVD	Digital Versatile Disk
EFA	Exploratory Factor Analysis
EUR	Euro
GDP	Gross Domestic Product
GFI	Goodness of Fit Index
GLM	General Linear Model
LAN	Local Area Network
LISREL	Linear Structural Relations
MDA	Mobile Digital Assistant
MLE	Maximum Likelihood Estimator
NFI	Normed Fit Index
P2P	Peer-to-Peer
PDA	Personal Digital Assistant
PII	Personal Involvement Inventory
RAM	Rapid Access Memory
RMSEA	Root Mean Square Error of Approximation
SEM	Structural Equation Modeling
SMC	Squared Multiple Correlation Coefficient
S-O-R	Stimulus-Organism-Response
S-R	Stimulus-Response
TFT	Thin Film Transistor
TV	Television
UMTS	Universal Mobile Telecommunication Standard
WAP	Wireless Application Protocol
WLAN	Wireless Local Area Network
WTP	Willingness-To-Pay

List of Variables

CS	Consideration Set
GPS	Global Price Sensitivity
HB	Habitual Purchasing Behavior
IN	Product Involvement
INC	Income
HH	Household Size
OP	Opinion Leadership
PC	Price Comparison
PK	Price Knowledge
PS	Domain-Specific Price Sensitivity
QU	Quality
SC	Social Comparison
SF	Smart-Shopper Feelings
SU	Social Utility
TA	Transaction Value

Chapter 1

Introduction

1.1 Problem Statement

In these days, the media conglomerates that once promised a dazzling new world are in financial disarray. The entertainment industry is battered by the contraction of advertising spending and the decline of content sales partly caused by illegal copying of content.

However, the temporary downturn of the industry from 2000 - 2003 cannot mask the promising increase in the consumption of entertainment. People are consuming entertainment as never before (Vogel 2000, pp. 6-20). The industry can profit from this increase in consumption only if either the advertising industry or the consumers are willing to increase their spending. Hence, with the collapse of profits, *price* plays an even greater role in the dual market of the media world. The profits of media companies can be calculated as the difference of total revenues and costs for the production and distribution of the content.

$$\textit{Profits} = \textit{Total Revenue} - \textit{Costs} \quad (1.1)$$

In order to increase profits, either costs have to be reduced or revenues have to rise. If we assume the costs to be exogenously given, profits can only rise by increasing sales volume or increasing prices.

The total revenues of media companies consist of sales of content and contacts.

The content is sold to consumers. Contacts *to* consumers are sold to companies that are willing to pay for advertising. The function for total revenue is given as:

$$TR(P) = P \cdot Q + \frac{C}{1000} \cdot A \quad (1.2)$$

where

TR = total revenue

P = price of the product

Q = quantity demanded at price P

C = number of contacts established at price P

A = advertising price for 1000 contacts.

Evidently, price, defined as "the amount of money asked or paid for something" (Webster's Third New International Dictionary 1993), is the most decisive variable in this equation. Thus, the point of departure for this research is the analysis of consumers' perceptions of and reactions to the price of electronic entertainment.

So far, managers have especially focused on increasing sales volume and reducing costs. Pricing seems to be mostly used in an instrumental way to pursue a larger quantity of sales. In the media markets, price changes and price wars can have severe consequences. For media products there is no natural bottom to the price (see chapter 2.3). Price wars can result in content being given away for free because once the first copy of an entertainment product has been produced, the development costs are non-recoverable fixed costs and the costs for each additional copy are close to zero.

Pricing is an extremely important part of the marketing mix that has been neglected for a long time. It is the only marketing strategy variable that generates a positive cash flow. The remaining variables (advertising and promotion, product development, selling effort, distribution, packaging) all create costs. To optimize pricing and all related marketing mix instruments, price sensitivity is an essential construct. *Sensitivity* is defined as "the response of an organ or organism to external stimuli" (Webster's Third New International Dictionary 1993). Put together, the term *price sensitivity* clearly refers to the response of an individual to the amount of money asked or paid for a good or service. This commonsense definition is generally agreed upon (e.g., Hoch et al. 1995; Tellis 1988). It indicates what effect a price change will have on the

buyer's intention to purchase a given product or class of products. If buyers are considered price sensitive, changes in price will cause (definite) changes in their buying behavior. If they are not price sensitive at all, price changes will not result in a change in their purchasing behavior.

In this study, price is assumed to have a negative effect on the purchase probability. A higher price will normally lead to lower demand.¹ Price is hence a negative attribute of an electronic entertainment product. Price sensitivity is defined as the degree to which consumers use price as a decision-making criterion (Lichtenstein, Bloch, and Black 1988).

However, its analysis has been mostly focused on traditional consumer goods like groceries or apparel, which have different characteristics in production and consumption than electronic entertainment or media products. In order to assess what actions have to be taken by media companies to react to price sensitive consumers, the price sensitivity construct and its determinants and consequences have to be scrutinized.

1.2 Objectives of Research and Potential Contributions

The objectives of this work are to explain price sensitivity for electronic entertainment and its consequences for the entertainment industry. The analysis of price sensitivity in a complex psychological model reveals some mechanisms at work that are able to explain what factors influence price sensitivity, what its consequences are and how price sensitivity is reinforced.

The following research questions need to be answered:

- (A) What are the determinants of price sensitivity?
- (B) What are its cognitive and behavioral consequences?
- (C) What are the managerial implications of price sensitivity?

Hence:

¹For positive price elasticities or price as a positive attribute see chapters 3.2 and 3.3.1.

1. The price sensitivity construct has to be explained.
2. Hypotheses that relate determinants and consequences to price sensitivity are introduced.
3. A comprehensive model of price sensitivity is presented.
4. A survey for testing the model is developed and conducted.
5. The scales used for measurement in the survey are examined in terms of reliability and validity.
6. The empirical findings are used to test and evaluate the model.
7. Managerial implications are drawn.

In contrast to economics, price sensitivity is modeled as an endogenous variable in this study and not just as a part of a black-box model. In psychological terms, economists' models are often stimulus-response ($S \rightarrow R$) models. Rising prices (S) lead to lower demand (R) (Fischer and Wiswede 2002, p. 40). However, this economic or behaviorist model does not help the marketer in any of the three research questions posed above. That is why a perspective from the behavioral sciences has to be employed. Researchers in behavioral sciences are interested in organismic processes that behavior is a part of.

The potential contributions of this dissertation are theoretical, methodological, empirical, and managerial. The theoretical contribution can mainly be seen in the comprehensive model of the determinants and consequences of price sensitivity. The determinants are to predict the degree of price sensitivity and its consequences. The methodological contribution consists of how the relevant variables in the model are measured and the examination of the reliability and validity of their measurement scales. The application of a structural equation model as a quantitative method to test the model can further provide evidence for the usefulness of this econometric technique in a behavioral pricing study. The data collection constitutes an empirical contribution to test the theory and to test the measurement methods. The experiences in this process can help improve further research. Finally, this study suggests to managers which variables have the greatest impact on price sensitivity and how to possibly cope

with its consequences. This is a very important contribution because pricing electronic entertainment products is very complex task.

It is important to note that in this study the analysis of price sensitivity is restricted to the domain of electronic entertainment for two reasons. First, it is assumed that the determinants and consequences for price sensitivity in miscellaneous product categories are not identical. This reason refers to the *selection* of the variables related to price sensitivity in the model. Secondly, a conclusive testing of a customized model is more auspicious. Questions have to be adapted to special product characteristics. Even if the variables for a model of price sensitivity were identical in all or in most product classes, the *degree of influence* of variables would certainly vary. This could render inconclusive results. Moreover, the *statistical significance* of the results might be neglected, assuming that the total size of the data set is restricted. If focussing on specific product categories, the researcher is more likely to procure sample sizes sufficient for demanding econometric methods such as structural equation modeling. With small samples ($N < 200$) conclusive testing with structural equation modeling is difficult.

To put it more generally: In any case, the researcher faces a trade-off when trying to formulate a theory and trying to back this theory up with field research: the more products are involved in the theory, the greater the explanatory value of the theory is. However, the questions in a survey should specify the product and situation. The less specific these questions are, the greater the interpretation possibilities become. This is almost sure to produce considerable measurement error. Achieving reliable and valid results seems improbable, then.

Still, similarities in theoretical approach, in methodology, and in managerial implications are probably larger than the differences. Therefore, the theoretical, methodological, and managerial contribution can be a starting point for other empirical studies examining price sensitivity, too.

For theoretical reasons, the analysis of price sensitivity in the electronic entertainment market provides an ideal setting. It is a relatively new and very fast changing, dynamic market. Habitual behavior has been established to a lesser degree compared to other markets. The absence of habitual behavior makes

identifying cognitive processes that take place during the purchasing process easier which might help collecting data and testing the model. It helps trace back price sensitivity and its consequences to its determinants.

1.3 Organization of Research

In the current study, the author defines, discusses, and models the construct of price sensitivity for the domain of electronic entertainment. Chapter Two provides the foundations for the research by introducing the market of electronic entertainment. It starts with the presentation of the products and end-devices consumers use to enjoy entertainment. This is followed by the explanation of the demand for electronic entertainment from a general psychological perspective. A microeconomic perspective and an analysis of relevant trends explain the rise in demand for entertainment. The illustration concentrates on three classes of electronic entertainment that are cornerstones of the industry and that field research is conducted for: (1) PC-based internet entertainment, (2) entertainment on mobile phones, and (3) video games on consoles or on the PC. After the demand side has been depicted, an approach from a supplier's perspective elicits the economic process at work for the supply side in the market of electronic entertainment. First, the impact of network effects on competition is discussed. This is followed by the explanation of different revenue models and pricing decisions in the market.

Chapter Three presents a model for price sensitivity. In the beginning, the basic model structure model is depicted as an abridged S-O-R (stimulus-organism-response) model: a number of product-related, personal, and social determinants influence the central variable, price sensitivity, which in turn leads to behavioral and cognitive consequences. The remaining sections of Chapter Three follow this model structure. The discussion of *each* variable of the model is segmented into three parts:

- the definition of the construct under consideration,
- its relationship to price sensitivity, and
- its measurement possibilities.