

BUILDING MODELS FOR MARKETING DECISIONS

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by

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To our spouses:

**Hanneke
Marian
Hennie
Magda**

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Preface

This book is about marketing models and the process of model building. Our primary focus is on models that can be used by managers to support marketing decisions. It has long been known that simple models usually outperform judgments in predicting outcomes in a wide variety of contexts. For example, models of judgments tend to provide better forecasts of the outcomes than the judgments themselves (because the model eliminates the noise in judgments). And since judgments never fully reflect the complexities of the many forces that influence outcomes, it is easy to see why models of actual outcomes should be very attractive to (marketing) decision makers. Thus, appropriately constructed models can provide insights about structural relations between marketing variables. Since models explicate the relations, both the process of model building and the model that ultimately results can improve the quality of marketing decisions.

Managers often use rules of thumb for decisions. For example, a brand manager will have defined a specific set of alternative brands as the competitive set within a product category. Usually this set is based on perceived similarities in brand characteristics, advertising messages, etc. If a new marketing initiative occurs for one of the other brands, the brand manager will have a strong inclination to react. The reaction is partly based on the manager's desire to maintain some competitive parity in the marketing variables. An economic perspective, however, would suggest that the need for a reaction depends on the impact of the marketing activity for the other brand on the demand for the manager's brand. The models we present and discuss in this book are designed to provide managers with such information.

Compared with only a few decades ago, marketing models have become important tools for managers in many industries. Prior to the introduction of scanner equipment in retail outlets, brand managers depended upon ACNielsen for bimonthly audit data about sales, market shares, prices, etc. for the brands in a given product category. Those data were rarely good enough for the estimation of demand functions. Indeed, Art Nielsen used to say that Nielsen was in the business of reporting the score and was not in the business of explaining or predicting the score. With technological advances (e.g. the availability of scanner data, improved hardware and software), the opportunity to obtain meaningful estimates of demand functions vastly improved.

We use a simplified example to illustrate the possible impact of models on marketing decisions. When the scanner data from supermarkets became available for the first time in the late 1970's, graphs of store sales, prices and promotions over time (weeks) showed that temporary price cuts often produced extremely high increases in sales of the promoted brand. A manager for whom the brand's market share is an important performance measure would be inclined to seize the apparent opportunity to boost sales. Thus, weekly scanner data, offered insights into short-term effects to managers that were unavailable from the bimonthly audit data. These new insights formed one of the reasons why promotional expenditures in the US grew dramatically in the 1970's and the 1980's. The modeling of promotional effects was initiated quickly by IRI after scanner data became available. Yet it has taken many years of model building and testing by ACNielsen, IRI and many academic researchers, before a reasonably comprehensive understanding of the effects of promotional activities resulted. The results suggest that the sales increases that are attributed to brand switching are typically negated by competitive reactions. Another part of the sales increase is due to purchase acceleration most of which does not result in consumption increases. In addition, increases in promotional expenditures (relative to, say, television advertising) appear to increase consumers' price sensitivities and to reduce brand loyalties. The extensive amount of modeling that has been done commercially and academically suggests that promotions are rarely profitable. Not coincidentally the insights from models are partly responsible for the apparent decline in promotional expenditures in the US, both in an absolute sense and relative to television advertising in the late 1990's.

Scanner data offer an opportunity for managers to obtain a detailed understanding of the complexities of the marketplace. At the same time the explosion of these data makes it inescapable for the manager to use tools for analysis. Indeed, managers will be more effective decisions makers if they use models for relatively routine decisions so that they have more time for decisions that require creativity and for other elements outside the purview of model building. However, models differ greatly in their quality and usability for marketing decisions. Indeed, many managers have had bad experiences, perhaps because a model builder oversold the model's potential. Alternatively, inappropriate requirements such as: "only a model with a R^2 value of at least 90 percent is acceptable", may have influenced the model-building process in an undesirable manner.

In this revised edition of *Building Implementable Marketing Models* (Naert, Leeflang, 1978) we provide a detailed discussion of the following steps in the model-building process: specification, estimation, validation, and use of the model. The managerial usefulness of a given model will be greatly enhanced if the model-building exercise follows carefully designed procedures. This book is our attempt to provide a structure for model building. The content of the book should be of interest to researchers, analysts, managers and students who want to develop, evaluate and/or use models of marketing phenomena.

Managers will particularly benefit from models of marketing phenomena if they understand what the models do and do not capture. With this understanding they can, for example, augment model-based conclusions with their own expertise about complexities that fall outside the modelers' purview. Importantly, the systematic analysis of purchase (and other) data can provide competitive advantages to managers. Model benefits include cost savings resulting from improvements in resource allocations as we discuss in various applications. And the leaders or first movers in the modeling of marketing phenomena can pursue strategies not available nor transparent to managers lagging in the use of data.

The book is suitable for student use in courses such as "Models in Marketing", "Marketing Science" and "Quantitative Analysis in Marketing" at the graduate and advanced undergraduate level. The material can be supplemented by articles from journals such as the *Journal of Marketing Research*, *Marketing Science*, *Management Science* and *The International Journal of Research in Marketing*.

It consists of four parts. Part I provides an introduction to marketing models. It covers the first four chapters and deals with the definition of a model, the benefits to be derived from model building, and a typology of marketing models.

In part II, which covers 10 chapters, we give guidelines for model specification and we discuss examples of models that were developed in the past thirty years. We start with some elementary notions of model specification. Then we discuss the modeling of marketing dynamics and implementation criteria with respect to model structure. This is followed by a presentation of descriptive, predictive and normative models, models to diagnose competition, etc. We discuss many specification issues such as aggregation, pooling, asymmetry in competition and the modeling of interdependencies between products. The primary focus is on models parameterized with aggregate data. In Chapter 12 we introduce models that describe individual (choice) behavior.

Part III (4 chapters) covers topics such as data collection, parameterization and validation. We present estimation methods for both objective and subjective data.

Aspects of implementation are the topics of Part IV, which covers (three) chapters on determinants of model implementation, cost-benefit considerations and the future of marketing models.

Chapters 2-10 in this book correspond with chapters 2-9 of Naert and Leeflang (1978). These chapters have been updated and rewritten. Chapters 11-18 are new and/or are completely rewritten. Chapters 19 and 20 are partly based on Chapters 13 and 14 from Naert, Leeflang. The discussion about the future of marketing models (Chapter 21) is new.

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