Chapter 9

Applications of the Stochastic Multicriteria Acceptability Analysis Method for Consumer Preference Study

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ABSTRACT

Introducing a new product to the market is a complex, costly and time-consuming process which requires research on consumer preferences. On the basis of information on the characteristics of the new product and its competitors, as well as on the competitors and their market shares, the company has to estimate future market shares and to determine the profile of potential consumers inclined to purchase the new product. The purpose of our paper is to present a method of consumer preference research when introducing a new product, using a multiple criteria method called Stochastic Multicriteria Acceptability Analysis (SMAA). To apply this method, no information requiring tedious research is needed. SMAA allows to obtain essential information on the potential market power of the new product already at an early stage of its preparation. Furthermore, the flexibility of the SMAA method allows to easily expand the scope of the analysis by including additional information and various techniques of the modeling of the consumer selection process.

INTRODUCTION

Planning to introduce a new product to the market is a complex, costly and time-consuming process. Already at the very beginning it is necessary to determine the appropriate goals and marketing strategies. A company has to answer the following questions: Should we modify an existing product or introduce an entirely new one? What features should the new product have to successfully compete for the market

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share? What is the profile of the consumer who will be inclined to choose this particular product and what market share can we expect?

To effectively answer these questions, it is necessary to construct an appropriate market model. First, the company has to find out consumer preferences. Unfortunately, the necessary market research is time-consuming and costly.

It turns out, however, that we can approach this issue from a different point of view, using multicriteria Stochastic Multicriteria Acceptability Analysis (SMAA). We will show that on the basis of easily accessible data, related to the technical specifications of the product being introduced and to its potential competitors, as well as to the market shares of the existing products, it is possible to predict the division of the market and to characterize the potential buyers of each new product.

The purpose of the present paper is to present a method for researching consumer preferences when introducing a new product to the market, using a multiple criteria method called Stochastic Multicriteria Acceptability Analysis (SMAA).

The basic assumption of the method proposed is the restriction of the analysis to those goods whose purchase is preceded by a carefully thought-out decision. This means that prior to each purchase, customers gather detailed information on the products available and rationally choose the product which best satisfies their needs, taking into account many different evaluation criteria.

In the case of such goods the basic assumptions of the neoclassical theory of consumer choice remain valid. It is also possible to represent the decision making process using an arbitrary multiple criteria decision analysis (MCDA) method. This is in so far important as the SMAA method is very flexible and capable of being combined with an arbitrary model of consumer choice, provided the model allows to rank the selection alternatives. To facilitate the computations, we have assumed that consumers make their choices according to one of the most popular multiple criteria method, namely PROMETHEE II.

The first section of the paper constitutes an overview of basic issues of the theory of consumer choice and of the preference measuring techniques. Next, we present the theoretical foundations of the SMAA method in its classical approach as an MCDA method as well as those of the PROMETHEE II method. The next section is devoted to the presentation of our new method of researching consumer preferences and to the effects of introducing a new product to the market. Our method applies the approach which is used also in the SMAA and PROMETHEE II methods. Further in our paper we present an illustrative example which shows how our method is applied to a specific situation. Remarks on directions of future research, conclusions, and bibliography conclude the paper.

**BACKGROUND**

**Consumer Preferences**

The notion of preference can be represented as a mathematical relation. It has the following properties:

- The preference is transitive, that is, given three goods of which the first is better than the second, and the second better than the third, then it follows that the first good is also better than the third one;
- The preference is reflexive, that is, the same goods are evaluated in the same way;
- The preference is complete, that is, we can compare any two goods.