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# Forecasting market share using predicted values of competitive behavior: further empirical results

Daniel Klapper<sup>a,\*</sup>, Helmut Herwartz<sup>b</sup>

<sup>a</sup>*Humboldt University Berlin, Faculty of Economics and Business Administration, Institute of Marketing, Spandauer Str. 1, 10178 Berlin, Germany*

<sup>b</sup>*Humboldt University Berlin, Faculty of Economics and Business Administration, Institute of Statistics and Econometrics, Spandauer Str. 1, 10178 Berlin, Germany*

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## Abstract

Forecasting is an important marketing activity for evaluating the expected performance of alternative marketing plans, especially in order to predict earnings, sales or market shares. The purpose of this paper is fourfold. Firstly, we develop and evaluate alternative econometric approaches to predict competitors' future actions. Secondly, the forecasting performance of attraction models is compared to those of linear and multiplicative market share models not only if competitors' actions are known a priori but also if competitors' actions are forecasts. Thirdly, the effects of alternative structural specifications of attraction models on the forecasting accuracy are investigated. Finally, we reinvestigate the impact of OLS estimation versus GLS estimation on the forecasting performance. The adopted empirical methods account for the interdependence of marketing instruments. We also allow for competitive reactions up to 10 periods ago and introduce a new approach concentrating on so-called marketing events characterizing directly the contemporaneous choice of several promotional activities within a brand. Analyzing weekly scanner data from three markets we find that attraction models outperform the share predictions of the linear and multiplicative models even if competitors' actions are forecast. This result is valid on the market and brand level. In addition, response models outperform the naive model on the market level irrespective of whether competitors' actions are known a priori or if they are forecasts. On the brand level the superiority of response models over naive models diminishes though it still exists. With respect to the best method of predicting competitors' actions it turns out that parsimonious specifications like autoregressive price predictions or binary logit models perform conveniently.

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*Keywords:* Forecasting competitors' actions; Market share models; Naive models; Market level forecasting; Brand level forecasting; Forecasting accuracy

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## 1. Introduction

Forecasting is an important marketing activity

\*Corresponding author. Tel.: +49-30-2093-5707; fax: +49-30-2093-5675.

*E-mail address:* dklapper@wiwi.hu-berlin.de (D. Klapper).

for evaluating the expected performance of alternative marketing plans, especially in order to predict earnings, sales or market shares. In the last two decades an intense debate has focused on the advantages and benefits of using market share response models to forecast market shares. Brodie, Danaher, Kumar and Leefl-

ang (1998) have developed principles to guide market analysts. They summarized the key criteria for judging under which circumstances market share response models are useful for forecasting. Strong support exists in favour of market share response models over the naive model when: (1) the sample size is rather large with approximately 100 periods for calibration and validation; (2) when strong current effects of the marketing instruments are present; (3) when market share models with brand-specific response parameters are estimated; and (4) when store-level scanner data (disaggregated data) rather than aggregated market-level data are used. In addition, a recent study by Kumar (1994) indicates that an attraction model with brand-specific parameters for each marketing instrument outperforms linear and multiplicative models and that GLS estimation should be preferred to OLS estimation if the data are not homoskedastic.

When competitors' actions are forecast, however, the results are not that clear. For example Kumar (1994) shows that the performance of market share response models is superior to that of naive models even if competitors' actions are forecast. However when autocorrelated errors and heteroskedasticity are introduced to the values for competitors' variables, the performance of naive models appears to be better than that of econometric models. When introducing smaller errors, the performance of naive models is comparable with attraction models estimated by GLS and better than linear and multiplicative models. With larger errors in competitors' variables, the performance of naive models is better than all types of market share response models. In contrast to these results Brodie and Bonfrer (1994) show that when competitors' actions are forecast, a market share response model does not consistently outperform the naive model on the brand or market level (in 10 out of 20 cases the naive model shows higher forecasting accuracy). Brodie and Bonfrer use store-level

scanner data and linear and multiplicative market share response models with brand-specific parameters. In contrast to this, the study of Alsem, Leeftang and Reuyl (1989), which is based on bimonthly data for six brands from three markets, reveals that using predicted values of competitive marketing behavior may provide better market share predictions than when using observed values of competitive behavior. Their results are surprising because predicted values of competitors' actions by definition contain a prediction error. In addition to that, the fully specified market share response model fails to outperform the naive model even when competitors' actions are known a priori.

With reference to this Danaher (1994) shows that a naive model is likely to be preferred in most market share forecasting situations when competitors' actions are forecast. He has developed a criterion to evaluate the conditions when market share response models are useful for forecasting on the assumption that competitors' actions are also forecast. The performance of market share response models in contrast to naive models depends on the number of observations and parameters, the number of brands in the market and the fit of the market share response model. With respect to the results of Brodie and Bonfrer (1994), Danaher (1994) and Kumar (1994), Brodie et al. (1998) conclude that there is a priority for research to investigate alternative procedures of forecasting competitors' actions.

On the basis of these results the purpose of this paper is fourfold:

1. *To develop and evaluate alternative econometric approaches to predict competitors' future actions.* Time series models and econometric models that account for the contemporaneous choice of other marketing instruments are applied to predict competitors' actions. We also allow for competitive reactions within the last 10 weeks.

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