

Submission for the Award of  
Doctor of Philosophy (Marketing)

**AN EMPIRICAL ANALYSIS OF STOCK-KEEPING UNITS DEVIATING FROM  
THE REIBSTEIN-FARRIS DISTRIBUTION AND MARKET SHARE MODEL:  
THE ROLE OF PRODUCT- AND DISTRIBUTION-RELATED  
CHARACTERISTICS**

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## **Abstract**

This research investigates the relationship between distribution and market share for consumer packaged goods (CPGs) by replicating a well-established statistical model (Reibstein-Farris [RF] model) across seven CPG categories in the United States (US) market. It specifically examines the influence of individual stock-keeping units' (SKUs) product- and distribution-related characteristics on deviations from expected market share performance.

For brands to grow in the market, they must be made available. Distribution is one of the most important and resource-intensive drivers of a brand's market share. However, decisions aimed at increasing a brand's market share usually involve more than simply the location and number of places to offer the product. Understanding the pattern of the relationship between distribution and market share, and subsequently examining the market share variations of individual CPGs from expected market share, has the potential to improve the market outcomes of CPG brands. Understanding the influences of product- and distribution-related characteristics and incorporating them into marketing strategy and planning has important managerial implications. Some examples include suppliers assessing the effectiveness of their investment in distribution versus variations of product- and distribution-related characteristics to better manage brand portfolios, or for retailers to modify their listing decisions to improve their category management in the face of competition and profitability targets. While some studies have investigated the general relationship between distribution and market share, a systematic analysis of the pattern has not previously been undertaken, and the role of specific CPG product- and distribution-related characteristics as antecedents of market share deviations has also not been studied thus far.

This research analysed weekly store scanner sales data of 9,321 SKUs in 7 CPG categories from 8,117 stores representing 49 different retail chains in the US. This quantitative research design required new strategies for mining and analysing big data. Rigorous data cleaning and manipulation using programmed algorithms was followed by non-linear least squares (NLS) regression modelling to replicate the RF model. This established the dependent variable (DV) for the subsequent regressions, which tested the influence of various product- and distribution-related SKU characteristics on market share variations from the initial estimates.

A key finding from this thesis is the confirmed validity of the convex, increasing relationship between distribution and market share. The empirical approach of measuring the curve pattern—including identifying curve intervals with differing subordinate patterns, as done in this thesis—is new and supersedes visual examination.

The thesis also revealed that both product- and distribution-related SKU characteristics can affect the above- or below-average market share deviation from the RF model. An SKU's pack size, brand type, presence across retail chains, share of different store sizes and sales consistency across different store sizes have the strongest relative effect on market share.

The findings from this research suggest that regardless of a brand's size or market rank, it has the opportunity to gain additional market share by strategically accommodating its SKUs' product- and distribution-related characteristics. This involves effective branding, product design and pricing strategies, carefully managing a brand's presence across different retail chains, store sizes, sales consistency and considering in-store conditions such as category specialisation.

This thesis covers a significant gap in the body of literature regarding the pattern of the distribution–market share relationship. It particularly contributes to push-and-pull theory and a recently established framework of distribution breadth and depth dimensions (Ailawadi & Farris 2017).

The findings have implications for academics, suppliers and retailers. Practical implications are specifically related to product and portfolio management, supply chain management and retailer category management.

The applied methods in this study offer effective analytical approaches to academics and analysts, and highlight the value of modern data analysis involving programmed algorithms, metrics and econometric modelling. Future research could further investigate consumer and trade behavioural dynamics regarding product characteristics, as well as factors influencing distribution breadth and depth.