



# Valuing intangible assets with a nested logit market share model

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## Abstract

This paper develops an econometric method for valuing intangible assets using nested logit market share assumptions. Specifically, a method is developed to measure the value to a license holder of owning a branded consumer product. While it is well known that brands confer values to their owners, existing methods for establishing a brand's value via comparable, profit, or income methods are often fraught with imprecision or are frequently based on untested assumptions. An economic approach to brand valuation is developed in which the demand for branded goods is estimated and compared to the demand for comparable unbranded goods including both private label and generic commodities. The economic analysis relies on oligopoly pricing models and certain assumptions regarding the opportunity use of the brand holder's fixed investment. This paper extends the multinomial logit structure of preferences assumed in Dubin [1998a. *The Demand for Branded and Unbranded Products—An Econometric Method for Valuing Intangible Assets. Studies in Consumer Demand—Econometric Methods Applied to Market Data*. Kluwer Academic Publishers, Massachusetts, Boston, pp. 77–127] and derives trademark valuation fractions with a nested logit market share model. The market share demand model in Dubin [1998a. *The Demand for Branded and Unbranded Products—An Econometric method for Valuing Intangible Assets. Studies in Consumer Demand—Econometric Methods Applied to Market Data*. Kluwer Academic Publishers, Massachusetts, Boston, pp. 77–127] is re-estimated under nested logit assumptions and results for the trademark fraction are compared.

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## 1. Introduction

In this paper I consider the economic value of certain intangible assets such as trademarks and brand values. Specifically I estimate the trademark value for Carnation Company's Coffee-mate circa 1985. Coffee-mate was among Carnation's best known brands and continues to be sold today by Nestlé Corporation. Coffee-mate had (and continues to have) a relatively large market share, and consistently commanded a price premium relative to its unbranded competitors. I calculate Coffee-mate's trademark value expressed as a percentage of operating income and sales.

In brief, there are two basic components to the economic analysis of trademark value. First, historical sales data on brands and their competitors are used to estimate the demand for these products. The demand function can be used, with knowledge of production costs to determine the profitability of a product under alternative pricing strategies. The demand function summarizes all relevant information about the market for a product such as special population segments that purchase a particular product, seasonal variations in purchases, levels of advertising spent, and characteristics of similar products in the same market.

The second component of the economic analysis is a method for calculating the value of a brand trademark from the demand functions for the brand and its competitors. From an economic perspective, the value of a brand trademark to a producer is the difference between the profits that it would earn operating with the trademark and the profits it would earn operating without that trademark.<sup>1</sup>

A formula giving the appropriate split of total profit between the trademark and non-trademark components is derived in Section 2. The fraction of total profits attributable to the trademark, that is the "trademark fraction," is shown to depend on the market shares of the trademark brand versus that of the unbranded product (private label and generic goods) and their respective price elasticities.<sup>2</sup> In general, the greater the price elasticity of the branded good relative to the price elasticity of competing unbranded goods, the lower the fraction of profit which should be allocated to the brand trademark.

This paper extends the multinomial logit (MNL) structure of preferences assumed in Dubin (1998a). Logit models are commonly used in applied industrial organization (e.g. Werden and Froeb, 1994a, b; Werden et al., 1996; Shapiro, 1996) but have been criticized for their restrictive assumptions (e.g. Hausman et al., 1997). This paper derives trademark valuation fractions within a nested logit market share structure. The market share demand model for coffee creamers in Dubin (1998a) is re-estimated under nested logit assumptions and results for the trademark fraction are compared. In a similar fashion, Crooke et al. (1999) illustrated the effects of assumed demand form on simulated post merger equilibria. This paper is concerned with generalizing formulas for economic trademark values and with assessing the magnitude of the approximation error under logit diversion assumptions.

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<sup>1</sup>The value of a trademark can also include other attributes of value, such as long-term profit or growth potential, but the difference in current profits represents a useful floor on such overall values.

<sup>2</sup>The distinction between private label and generic commodities is discussed in Burke (1979). Burke notes that generics, while different from private label commodities in packaging and marketing, account for less than 1% of total food sales. In my analysis I do not distinguish between private label and generic commodities.

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