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Making Brand Management Accountable

The Influence of Brand Relevance, Globalness
and Architecture on Brand Efficiency

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Abstract

Brand managers are under increased pressure to illustrate the performance of their multimillion dollar expenditures. Many marketers believe brands are important because they influence customer decisions and ultimately create financial value. However, few brand managers are able to back up their beliefs with facts and figures. Thus, researchers and practitioners are increasingly advocating the need to link branding activities to customer-based brand equity and firm value. This paper provides four contributions: First, we introduce a two-stage concept of brand efficiency as a comprehensive and theoretically sound measure for the performance of the brand management process. Second, we examine internal (globaleness and brand architecture) and external (category-related brand relevance) variables that moderate brand management efficiency. Third, we provide a multi-item measure for brand relevance and validate this measure in 36 B2C product categories. Fourth, we assess brand efficiency and the influence of the moderating variables for 220 brands for 12 of these product categories.

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1 LINKING BRAND INVESTMENTS, CUSTOMER-BASED BRAND EQUITY AND FINANCIAL PERFORMANCE

Due to enormous brand investments in most industries measuring brand performance and investigating factors that influence brand performance have become crucial management tasks in the past decade (Aaker and Jacobson 2001). So far, researchers and practitioners predominantly focus on the brand equity construct as a measure of brand performance (Mizik and Jacobson 2008). Existing brand equity approaches almost exclusively consider brand investment outcomes which commonly are divided into customer-based and financial outcomes (for an overview see Ambler et al. 2002 or Yoo and Donthu 2001).

Several authors stress that most of existing brand equity metrics are developed ad hoc and are used in an isolated way (Keller and Lehmann 2006). More specifically, a lot of approaches only investigate consumers' cognition and affect as a result of branding activities. However, this narrow focus has prevented a full appreciation of the link between customer-related outcomes and the financial outcomes accruing from customers' attitudes. Thus, several authors call for a stronger integration of different outcome variables (Gupta and Zeithaml 2006; Lehmann 2004). Moreover, most approaches do not relate brand outcomes to brand investments which were employed to create these outcomes. Consequently, they offer no means to trace how brand initiatives affect a firm's cash flows and shareholders' wealth. This makes it difficult for brand managers to justify their investments while at the same time chief executive officers require greater marketing accountability (Rust, Lemon, and Zeithaml 2004; Srinivasan and Hanssens 2008).

The first contribution of our paper is to address these issues by introducing the concept of brand efficiency as a broader, more integrated measure of brand performance. Thus, we provide a methodologically and theoretically sound measure for the efficiency of the brand management process. We capture brand management as a two-step chain of input-output-transformations. In the first step brand investments (e.g., communication spending) are transformed to several customer-perceived outputs (e.g., brand awareness) which are in the second step transformed into financial outputs (e.g., brand revenues). Thus, we offer a single framework that can integrate the multitude of brand equity metrics. Furthermore, we consider both the input side (brand investments) and the output side (brand equity) simultaneously.

By considering a two step-process we offer a comprehensive model that traces how brand management actions are linked to cash flows for the firm and shareholders via generating cognitive and affective effects on the customer side. For each step of the chain we obtain a ratio of multiple outputs to multiple inputs yielding the “return on brand investment”. This efficiency operationalization reflects the recent advancements of resource-based view that competitive advantage derives not only from the level of brand investments but mainly from the efficient use of resources (Dutta, Narasimhan, and Rajiv 2005; Pan and Luo 2006). We explicitly model the brand management’s capability of converting employed resources into outputs efficiently. We employ a two-stage Data Envelopment Analysis (DEA)-model to measure the efficiency of both transformation steps for 220 brands for 12 categories. Substantial variance in the efficiencies is found across brands and across categories.

Obviously, brands are not equally successful in implementing the brand management chain efficiently. We suggest that several variables influence the efficiency of the input-output-transformation on both steps. These moderating variables are important factors for explaining the brand management inefficiencies observed for many firms. Drawing on the conceptual ideas of Keller and Lehmann (2003) we distinguish between external and internal moderators. As external or market-related factors they mention product category characteristics. Perry et al. (2003) propose the construct of brand relevance as a key variable that captures many market characteristics. According to this study, the influence or importance of the criterion “brand” for consumers buying decisions (brand relevance) varies heavily across product categories. This is supported by the findings of Court et al. (1996). Therefore, we suggest that one important reason for brand management inefficiencies lies in the fact that firms do not align brand investments to the level of brand relevance in their markets.

For example, utility companies in Europe invested millions of Euros in broad-coverage advertising campaigns to develop their brands. In fact, among consumers, energy corporation brands such as E.ON or Yello now achieve levels of brand awareness and esteem equal to those of traditional consumer goods. However, these expenditures did not translate into economic success. In March 2002, the business press reported that the branding campaign persuaded only 1,100 customers to switch to E.ON (Perrey et al. 2003). With advertising expenditures of EUR 22.5 million, acquisition costs of EUR 20,500 were spent per customer. Given the average annual turnover of approximately EUR 600 per customer, it is unlikely for

this investment to pay off over the customer life cycle even if “strategic growth options” are taken into account.

The E.ON campaign highlights that - although the level of brand awareness is very high - this might have little influence on purchase behaviour and thus, the translation efficiency from awareness to economic outcomes is weak. This leads us to conclude that brand relevance – i.e. the brands’ influence on consumers’ purchase decisions - is one important variable for predicting whether brand building efforts have financial impact.

Drawing on the literature, we suppose that in addition to brand relevance internal or firm-related moderators might be important for explaining variances in brand efficiency. In this regard, brand strategy-related variables like brand globalness and brand architecture are frequently mentioned (Rao, Agarwal, and Dahlhoff 2004).

As a second contribution we empirically test how brand relevance and globalness as well as brand architecture influence the input-output-transformation efficiency of brand management. In contrast to globalness and brand architecture, only few studies exist that address the conceptualization and measurement of a product market’s brand relevance (Fischer et al. 2004; Perry et al. 2003). However, these authors use a single-item measure for the brand relevance construct only. Therefore, to achieve the second contribution we develop a multi-item measure for the brand relevance in a product category in terms of the “brand drivenness” of purchase decisions in that category.

To test our hypotheses on the influence of the three moderators on brand efficiency we analyze 220 brands for 12 product categories exhibiting different levels of brand relevance and varying with respect to globalness and brand architecture.

2 BRAND EFFICIENCY

2.1 Brand Concept

Brands can be seen from both a formal (as a name, an expression, a sign, symbol etc.) and an effect-related perspective. The central idea of the effect-related approach is that a brand is ultimately created in the mind of the customer and thus cannot be defined exclusively by means of formal aspects. Consumers might associate a brand with a particular attribute or feature, usage situation, product spokesperson, or logo. These associations are typically viewed as being organized in memory as associative network (Anderson 1983). This network constitutes a brand's image, identifies the brand's uniqueness and value to consumers (Aaker 1996). In line with this interpretation we understand a brand as a map or semantic network anchored in the consciousness of the customer that differentiates a firm's products or services from those of a competitor (Figure 1).

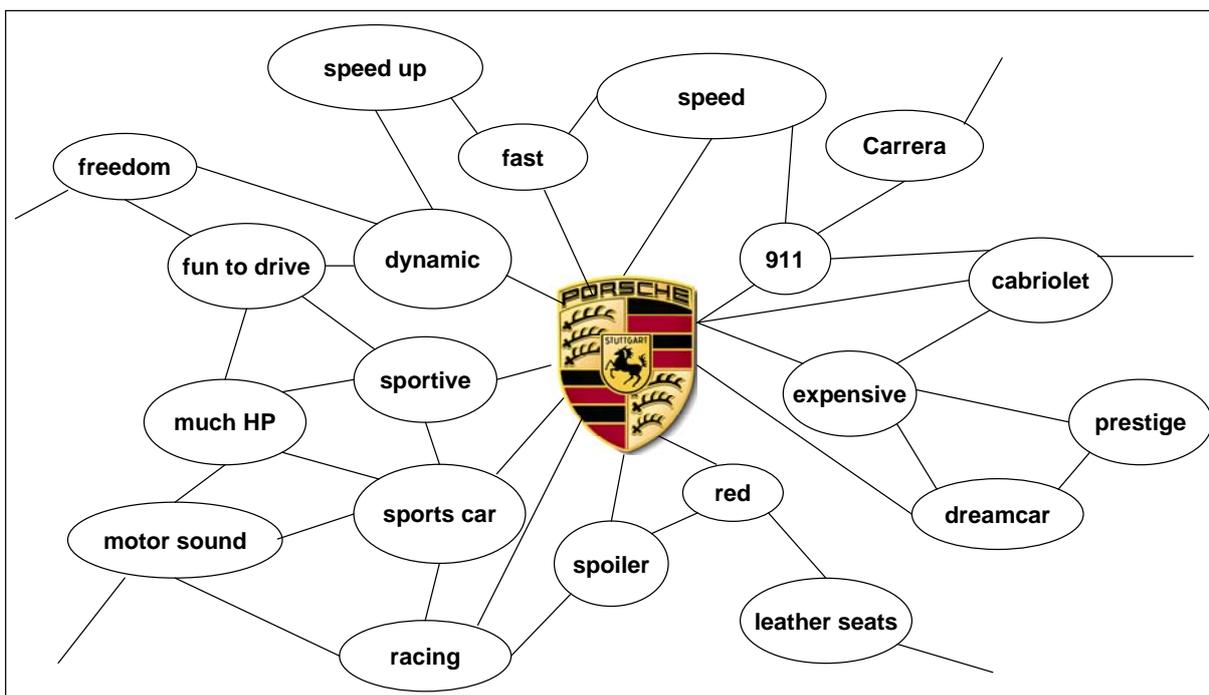


Figure 1: Brand Map of Porsche

2.2 Literature Review on Dimensions of Brand Equity

Brand equity is defined as the incremental value of a product due to the brand name (Keller and Lehmann 2006). This incremental value can be created at three different levels: customer level, product-market level, and financial-market level.

(1) Customer level

At this level, brand equity is part of the customer's attraction to a particular product from a particular company generated by the 'nonobjective' part of the product offering, i.e., not by the product attributes per se (Keller and Lehmann 2006). Thus, the customer-based brand equity (CBBE) construct refers to the incremental utility or value added to a product by its brand name. All approaches on customer level either implicitly or explicitly focus on brand-knowledge structures in the minds of consumers as the source of brand equity. To capture differences in brand-knowledge structures, most models focus on the following two aspects: awareness (ranging from recognition to recall) and associations/image encompassing tangible and intangible product or service considerations (Kapferer 2004; Keller 2003; Morrin and Ratneshwar 2003). We understand consumer-based brand equity as the difference of cognitive and emotional response between a focal brand and an unbranded product when both have the same level of marketing stimuli and product attributes (Yoo and Donthu 2001). The difference in consumers' response demonstrates the effects of the long-term marketing investments into the brand.

(2) Product-market level

The equity of a brand in product markets is ultimately derived from the words and actions of consumers. Consumers decide with their purchases, based on whatever factors they deem important, which brands have more equity than others (Villas-Boas 2004). A number of approaches have been developed to assess brand equity on product-market level. These include measures of price premiums, increased demand and repeat purchase rates, decreased sensitivity to competitors' prices, and the ability to enhance growth and market share (Hoeffler and Keller 2003). In this study we define the brand impact in product markets as the additional value (in terms of profitability and revenues) that accrues to a firm because of the presence of the brand name that would not accrue to an equivalent unbranded product.

(3) Financial-market level

The last approach to measuring brand equity is based on financial-market performance (Aaker and Jacobson 2001; Mizik and Jacobson 2008). One definition that has been proposed uses the component of market value that can not be explained by current-term financial measures (i.e., book equity or earnings). Thus, from a financial market's point of view, brands are assets that, like plant and equipment, can be bought and sold. The financial worth of a brand is therefore the price it brings or could bring in the financial market. Presumably this price reflects expectations about the discounted value of future cash flows. In the absence of a market transaction, it can be estimated by relating changes of brand attributes or brand attitude to movements in stock price. Studies show that the stock market reflects future prospects for brands by adjusting the price of firms (Mizik and Jacobson 2008). In this paper we define a brand's financial performance by the influence on stock price, P/E-ratio or market capitalization.

In spite of the numerous research efforts to define brand equity a general theoretical framework that orders and integrates the most relevant metrics has not been formulated so far (Erdem and Swait 1998). A number of "stand alone" brand equity approaches have been developed that capture but not link aspects of brand equity. They provide only fragmented insights rather than a comprehensive perspective on brand performance. Similarly, a number of dashboards, cockpits and scorecards are developed by firms using brand equity metrics in an isolated way (Ambler and Barwise 1998). This has given rise to certain confusion with the term. Therefore, in a recent research agenda on branding Keller and Lehmann (2006) call for approaches that integrate the three perspectives of brand equity. In the following section we introduce the concept of brand efficiency as a comprehensive and theoretically sound measure for the performance of the brand management process. In order to link brand equity measures to brand management actions we conceptualize brand management as a chain of input-output-transformations.

2.3 Brand Efficiency Concept

Brand efficiency or brand management efficiency is to be understood as a ratio of multiple brand outputs to multiple brand inputs. It captures how brand management transforms deployed brand investments (e.g., advertising spending) into brand outcomes (consumer based and financial brand success). Our brand efficiency operationalization reflects the “return on brand investment” and thus extends the notion of “return on investment” or “return on marketing” on branding (Rust et al. 2004; Rust, Zahorik, and Keiningham 1995). We argue that firm performance is not (only) driven by the level of marketing investments or the level of brand awareness, but predominantly by the capability to efficiently translate brand investments into awareness and, subsequently, awareness into profitable market outcomes. It is possible that some firms with higher brand efforts are outperformed by other firms with relatively lower levels of brand investments but higher translation efficiency.

Our approach reflects the recent advancements of resource-based view and capability theory that view management as an input-output process and capabilities as the efficiencies in this process, i.e. the concrete transformation function (Dutta et al. 2005; Pan and Luo 2006). There has been a long-standing criticism of capability theory for its lack of rigor in measuring capabilities. By applying the efficiency operationalization of capabilities and using DEA to measure efficiency we quantify the transformation capability of brand management. DEA benchmarks each brand’s efficiency – i.e. the return on brand investment – to that of the best practice brands that achieve the best input-output-transformation. These best practices form the maximum production frontier. The calculated relative efficiency score indicates the percentage of wasted inputs, i.e. the percentage of inputs that is not converted into outputs.

The purpose of our approach is to gain insights into how brand management can transform deployed inputs into outputs aligned to the steps of the brand management process. In order to conceptualize this brand management process we build on ideas proposed by Keller and Lehmann (2006) and introduce the input-output-chain of brand management (see Figure 2).

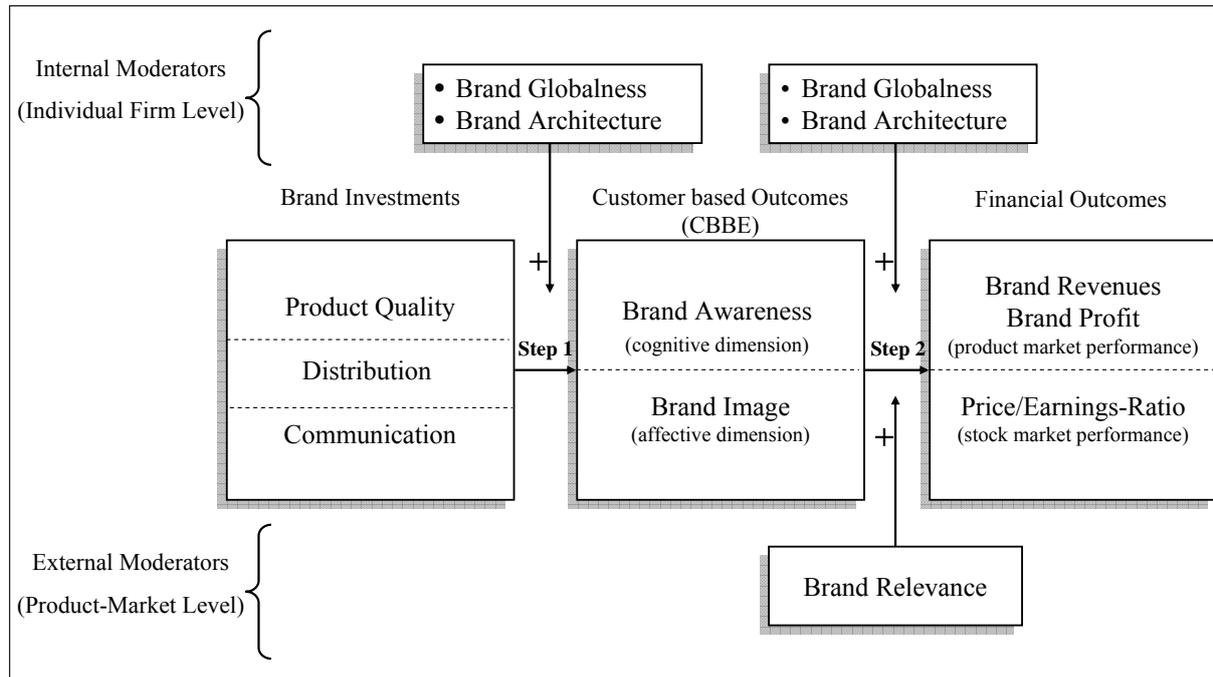


Figure 2: Brand Management Chain

In the first step of the chain brand management actions are considered which are linked both to cognitive and affective dimension of customer-based brand equity (CBBE). Because of its potential to ultimately create wealth for the firm and its investors we treat branding initiatives or actions as investments (Rao and Bharadwaj 2008). Referring to the literature review both dimensions of CBBE are captured appropriately by brand awareness and brand image respectively. According to the literature they are mainly driven by investments in communication, distribution and product quality (Rossiter and Percy 1997; Yoo, Donthu, and Lee 2000). The influence and the importance of these three key drivers can be supported by several theoretical arguments.

(1) Impact of product quality on CBBE

Empirical evidence exists that changes in objective quality in the short run (Boulding, Kalra, and Staelin 1999) and in the long run (Mittra and Golder 2006) have a strong influence on consumers' perception of quality. This perceived quality and not the objective product quality itself is the driver of satisfaction of individual needs and expectations towards the brand and thus forms a part of a brand's image (Sweeney and Soutar 2001). Tangible product quality is especially critical for performance-based brands whose sources of brand equity rest primarily in product-related associations (Keller 2003). A company investing high amounts in product

quality also benefits from positive word-of-mouth through satisfied consumers enhancing the awareness of the brand (Rust et al. 1995).

(2) Impact of communication on CBBE

Consumers, when exposed to advertising, pass through a sequence of cognitive, affective and conative stages before they finally purchase the product (Yoo, Stout and Kim 2004). The consumer receives information about a brand resulting in brand awareness (cognitive dimension). Building hereon, the consumer develops emotions towards the brand (affective dimension). On the basis of his brand image he then decides about the final purchase (conative dimension). In contrast to this rigid sequence, state-of-the art results indicates a “heterarchy” of effects, i.e. advertising may impact both brand awareness and brand image simultaneously (Cramphorn 2006; Vakratsas and Ambler 1999; Weilbacher 2001). This concern is met in our study by including both the cognitive (brand awareness) and affective (brand image) as outputs of the first step of the brand management chain.

Another theory supporting the impact of communication investments on CBBE is the information economics theory. To reduce their behavioral uncertainty, consumers make use of extrinsic cues. Heavy advertising spending may serve as such a cue to the (potential) customers, who perceive high advertising investments as a firm’s credible commitment to the brand. They assume that a company would not invest large amount of money in communications for a brand that will not fulfill the expectations of consumers, thus endangering repeat purchase (Erdem and Swait 1998). Hence, investments into advertising are positively related to perceived quality, leading to a more favorable brand image and thus higher CBBE.

Overwhelming empirical support for the successful generation of customer-based brand equity through advertising can be found in various empirical studies (Boulding, Lee, and Staelin 1994; Chu and Keh 2006; Cobb-Walgren, Ruble, and Donthu 1995; Yoo et al. 2000).

(3) Impact of distribution on CBBE

Distribution investments account for a large share of investments in the brand (Mahajan 1991). Exclusive or selective distribution may act as an extrinsic cue of superior quality to customers under asymmetric information. The enhanced perceived quality, again, strengthens

the brand's image (Chu and Chu 1994). Intensive distribution induces higher consumer awareness because of the ubiquitous availability of the product (Farris, Oliver, and de Kluyver 1989; Smith 1992). This leads to more shopping convenience, a reduction in searching and traveling time for the consumers and thus more utility and value attributed to the brand through the customer. Villarejo-Ramos, Rondán-Cataluña, and Sánchez-Franco (2008) find that distribution intensity is positively related to higher brand awareness and to higher brand image.

In the second step of the brand management chain, brand image and brand awareness are converted into financial outcomes. According to our literature review on brand equity we distinguish between product-market performance and stock-market performance. This follows the logic that from the marketing perspective consumers are the major constituency driving brand revenue, while shareholders constitute the central stakeholder from a financial perspective driving stock price.

(4) Impact of CBBE on product-market performance

According to the resource-based view, competitive advantages and superior performance originate from firm-specific endowments and use of resources. To be of strategic relevance and to contribute to a firm's sustainable success a resource has to be valuable, rare, non substitutable and inimitable (Wernerfelt 1984). According to the literature, it is widely acknowledged that brands are rare, and difficult to substitute and imitate due to their intangible nature and their legal protection (Capron and Hulland 1999). However, brands are not equally valuable for all markets as the link between CBBE and market performance highly depends on market characteristics.

For capturing product-market performance which reflects accounting performance we use brand revenues and operating income (EBITDA). Both measures have been shown in prior research to have specific information content (Kothari 2001; Mizik and Jacobson 2008).

(5) Impact of CBBE on stock-market performance

Brands that show high values on customer-based brand equity can increase shareholder value by enhancing the level of cash flows, accelerating the speed of cash flows, extending their duration and reducing the associated risk (Chu and Keh 2006; Srivastava, Shervani, and

Fahey 1998). In the context of signaling theory, company shares can be interpreted as credence goods since its return cannot be predicted before purchase. A brand can act as a signal for investors by supplying information content equivalent to that of stock prices, thus leading to faster purchase of shares and higher returns (Aaker and Jacobson 2001). Findings from the field of behavioral finance can be used to explain why strong brands can command higher share premiums. A large amount of a share premium that cannot be ascribed to fundamental factors can be explained by the existence of strong brands. When predicting the future performance of a company, investors and stock market analysts take into account the brands of the firm (Frieder and Subrahmanyam 2005; Kerin and Sethuraman 1998; Madden, Fehle and Fournier 2006; Mizik and Jacobson 2008; Shankar, Azar, and Fuller 2008).

Several publications capture stock-market performance by a company's market capitalization (e.g., Rust et al. 2004). We believe that from a financial-market perspective the stock price relative to earnings (Price/Earnings-ratio) should be used as an outcome of brand investments because it is a more comprehensive indicator for stock-market performance: Both the company earnings (E_i) and the willingness of investors to pay for it (measured by the P/E-ratio) are the drivers of market capitalization (MV_i).

$$(1) \quad MV_i = E_i \times \left(\frac{P}{E} \right)_i$$

Furthermore research findings in finance show that the P/E-ratio (willingness to pay) is positively influenced by the liquidity and breadth of a stock. According to Grullon, Kanatas, and Weston (2004) brand investments are a key driver of liquidity and breadth of a stock because stocks of strong brands are heavily traded. Additionally, investors view a strong brand as an indicator for the company's ability to create and to ensure future cash flows (Madden et al. 2006). This paper investigates how efficient brand investments are transformed into customer based outcomes (step 1) and, subsequently, how efficient this customer based brand impact is transformed into financial outcomes (step 2). In order to do so it has to be considered that the efficiency of the input-output-transformation in both steps might be influenced by several moderator variables. We discuss potential moderators in the next section.

3 MODERATING VARIABLES INFLUENCING BRAND EFFICIENCY

3.1 Categorization of Potential Moderators

The proposed brand management process captured in Figure 2 takes place in a permanently changing internal and external environment. To ensure efficiency of brand management a brand manager has to take into account certain moderating variables that may influence the conversion of brand inputs into brand outcomes. The literature on potential moderating factors suggests two categories of moderators (Keller and Lehmann 2003; Srinivasan 2006): firm-specific, individual characteristics (internal moderators) and product category-related characteristics (external moderators). Building on the extensive attention that branding strategies have received in the literature we will focus on the globalness (global vs. local brand) and brand architecture (corporate brand vs. product brand) as firm-specific moderators of branding efficiency. With respect to external moderators we will take into account the category-specific brand relevance as this variable reflects many market characteristics such as product complexity, risk profile and market dynamics (see the next section on brand relevance).

3.2 Brand Relevance

(1) Definition of brand relevance

No matter how successful firms will be in building strong brands (i.e., in creating high levels of awareness and image), there exists evidence that brands are not equally important to purchasing decisions in every product or service market (see the next section). We define brand relevance as the degree to which branding plays a key role in consumers' choice process for a product in a given product category (Fischer et al. 2004; Perry et al. 2003). The stronger the role of the brand against other purchase decision criteria, such as price, customer service, or product quality, the more relevant the brand appears. Brand relevance reflects how strong consumers activate their semantic brand networks during the buying process to support their decision.

(2) Literature review

Brand relevance is an often-used phrase, but it generally has not been well defined or explained. Aaker (2004) regards a brand as relevant if there is a perceived need or desire of a customer segment for a given product category and if the brand is part of the evoked set of brands that a segment considers as being material to the product category.

Similarly, Kapferer and Laurent (1992) find that the need for brand name in order to make a buying decision is mainly explained through product category characteristics such as choice complexity, market concentration and purchase frequency. Thus, it depends on the product category whether consumers in this category prefer to buy a well-known brand and mind to buy store brands.

Consultants of McKinsey & Company and researchers from Germany introduced the term brand relevance and conducted studies in various product categories (Perrey et al. 2003). Building on the work of Kapferer and Laurent (1992) they define brand relevance as the degree to which the brand plays a key role for consumers' choice process in a given product category. To measure brand relevance the authors use a single-item measure. They find that brand relevance is determined by product-market characteristics (e.g., kind of product, kind of purchasing process, and market-related conditions). Product-market characteristics determine the functions a brand can potentially fulfil in a product market and therefore they determine the brand relevance levels. Their data was gathered in a consumer market survey of more than 2,500 consumers. Brand relevance was assessed in detail for 45 product markets in the B2C sector. Fischer et al. (2004) advanced that study by validating the single-item measure using a constant sum scale and data from various studies that included the criterion brand in conjoint analysis.

In the context of B2B markets, Mudambi's (2002) exploratory study provides evidence that in particular categories most buyers are likely to choose well-known brands while in other categories most are "tangible" and place high emphasis on technical product attributes. Highly branding receptive categories contain products that require great service and support; are complex and involve high risk.

(3) Product-market characteristics as antecedents of brand relevance

The existing studies show that the importance of brands for consumers buying decisions is strongly related to market characteristics. Consumers will only be appreciative to brands as a decision criterion if the brand offers utility during or after the purchasing process e.g. in terms enhancing information efficiency and risk reduction (Erdem, Swait, and Valenzuela 2006). The extent to which brands can offer utility to consumers depends on product category characteristics (e.g., product complexity, visibility of brand symbol, price level of products etc.). That means that brand relevance varies across product categories depending on market characteristics.

(4) Brand relevance and the semantic brand network

Referring to our understanding of a brand as a semantic network anchored in the mind of the customer, brand relevance measures if consumers in a product category activate this network during the buying decision process to improve their decision. The network will only be activated if the brand (knowledge) delivers value to customers (e.g., increase information efficiency, reduce risk or deliver hedonic benefit). To illustrate our understanding of brand relevance we can use, for example, the market for luxury sports cars, a high-priced consumer product with low purchasing frequency. When thinking about buying a sports car, consumer associations should then be activated which are strongly linked to branding, such as perceptions of quality, prestige, fun. Consumers should use their brand networks and brand knowledge intensively because the brand of a sports car can create strong benefits, particularly with respect to “social consumption”. Branding could also reduce risk associated with the purchase of such an expensive and durable consumer item. Purchasing well-known brands can reduce this risk. In contrast, a brand function like information efficiency will be of less importance as consumers are prepared to take an extensive purchase decision. In contrast when buying paper tissues the consumer might just choose the product with the design or packing he likes most or simply chooses the cheapest paper tissue available. Therefore, there is no need to activate the tissue brand networks because the benefit of the brand for this particular purchase is low.

To view brand relevance as the degree to which a consumer activates the brand association networks during the buying process is important because it shows an important point: Assume that for paper tissues brand relevance is low and the importance of price is high. The producer might argue to position the tissue brand as a low price brand and to invest in communication to build up a brand network with a strong “low price-association” in consumer’s mind. Then although of the revealed low brand relevance the brand should have an influence because it is associated with the most important buying decision criterion. According to our understanding this line of reasoning is wrong because even if the producer is successful in creating the low price-association, in a product category with low brand relevance this information will not be accessed as the semantic network that contains this link is not activated due to low brand relevance. Instead of investing in branding the manufacturer might focus on other criteria such as promotions, packaging design, pricing, or trade terms.

Summarizing the findings we think brand relevance reflects or bundles the impact of several product-market variables (product complexity etc.) and thus is located on an aggregated level.

(5) Influence of brand relevance on brand efficiency

While the first step of the brand management chain is mainly concerned with the creation of awareness and favorable customer perceptions, the task in the second step is to deploy the generated consumer-based brand equity in the marketplace. Deployment refers to “executing” and “implementing” actions in a way that they lead to superior market performance (Pan and Luo 2006). Several studies emphasize that market characteristics, challenges and requirements determine if CBBE can be converted into financial outcomes efficiently (Slotegraaf, Moorman, and Inman 2003). Market characteristics are exogenously given and cannot be controlled by brand management, at least not within a short-term horizon (Smith 1992). Thus, for exploring the reasons for success in the second step transformation market-based aspects play a much more important role than firm-related (internal) aspects (e.g., brand strategy). As explained above, we consider brand relevance as a construct reflecting the impact of several market characteristics. We hypothesize that only if brands have a significant impact on the buying decision of consumers (i.e., the level of brand relevance is high), high efficiency of translating consumer-based brand equity into financial success will occur. Thus, we formulate:

H_{1a}: In the first step of the brand management chain, no significant efficiency differences exist between product markets with high, medium and low brand relevance.

H_{1b}: In the second step of the brand management chain, efficiency is significantly higher in product markets with high brand relevance than in product markets with medium brand relevance and this efficiency is significantly higher than in product markets with low brand relevance.

3.3 Brand Globalness

An often cited performance determinant is whether a firm pursues a global or local branding strategy. A global brand strategy is linked with a multi-country or worldwide distribution and a high degree of standardization regarding positioning, image and marketing mix (Aaker and Joachimsthaler 1999; Craig and Douglas 2000; Quelch 1999). The key reason to follow a global branding strategy is the possibility of generating strong synergies and economies of scale. A standardized brand helps to save costs in communication, production and logistics (Steenkamp, Batra, and Alden 2003). Building a strong brand image is reinforced if consumers are exposed to the brand not only in their home country but also in other countries. A uniform brand communication across countries reinforces the consumers' response in terms of awareness and image (Holt, Quelch, and Taylor 2004; Yip 2003). The accumulated exposure frequency therefore enables the company to leverage the efficiency of its advertising investments (Craig and Douglas 2000). Centrally managing the same brand in several countries reduces complexity in brand management which again reduces costs as well as increases efficiency in operations (Keller 2003; Quelch 1999). This diversification into various geographical areas mitigates the risk of the company by reducing earnings volatility (Srivastava and Reibstein 2004).

Following the above argumentation, it seems logical that the same brand equity values can be achieved with lower brand investments compared to firms following local branding strategies. Therefore, we hypothesize that globalness positively influences the input-output-translation in the first step of the brand management chain. Findings also suggest that global brands achieve better brand performance, thus seem to be more efficient in converting CBBE into market and financial outcomes, leading to higher efficiency scores on the second step of the brand management chain. Thus, the following hypotheses are formulated:

H_{2a}: In the first step of the brand management chain, efficiency is significantly higher for global brands than for local brands.

H_{2b}: In the second step of the brand management chain, efficiency is significantly higher for global brands than for local brands.

3.4 Brand Architecture

Srinivasan (2006) finds that a branded-house strategy significantly enhances the effects of new product introductions and brand advertising activities, compared to house-of-brands strategies on revenue premium. Similar to the rationale of global brands, to follow a branded-house-strategy seems more efficient than following a house-of-brands-strategy. A single brand allows the firm to save resources and obtain synergies in brand management, especially in communications, and facilitates the introduction of new products. As consumers associate higher quality and less risk with an umbrella brand (Erdem 1998), lower costs needed for building CBBE suggests higher efficiency levels in building brand value (Rao et al. 2004).

Several empirical studies show that a branded-house-strategy leads to increased performance (Rao et al. 2004; Shankar et al. 2008). However, by measuring overall performance, these studies neglect to examine the “black box” of how investments are transformed into financial outputs. Hence, by distinguishing between the customer and the financial perspective in our two-step framework we are able to locate the sources of the performance advantages of the branded-house strategy for each step of the brand chain.

To sum up, we assume that a corporate brand will be more efficient in the transition of brand investments into customer based brand equity due to lower costs needed for building comparable CBBE as product brands. A corporate brand may also show higher efficiency levels when transferring the latter into brand outcomes compared to product brands. Thus, we propose:

H_{3a}: In the first step of the brand management chain, efficiency is significantly higher for corporate brands than for product brands.

H_{3b}: In the second step of the brand management chain, efficiency is significantly higher for corporate brands than for product brands.

4 RESEARCH SETTING AND METHODOLOGY

4.1 Research Setting

To test our hypotheses we use the following procedure: First, we measure brand relevance in 36 different product categories, rank them according to their level of brand relevance and classify them into three groups (markets with low, medium and high levels of brand relevance). Second, for 12 product categories from these three groups brand efficiency is measured by using a two-step Data Envelopment Analysis model. Third, we conduct three studies to test the three potential moderating effects of brand relevance (H_{1a} and H_{1b}), globalness (H_{2a} and H_{2b}), and brand architecture (H_{3a} and H_{3b}), on brand efficiency as mentioned above.

In study 1 we use 12 product-categories: 4 categories exhibiting high brand relevance, 4 categories with medium and 4 categories with low level of relevance. Then we compare the efficiency for step 1 and step 2 respectively between the categories of the different relevance levels. Three of four categories for each relevance level contain brands that are not publicly traded. Thus, for these categories conventional (product-market related) performance metrics (EBITDA, brand revenue) are used as final outputs. To test for the robustness of the results, the fourth category for each relevance level consists of publicly traded “mono-brand” manufacturers. Thus, for these categories we can use product-market and stock-market related performance metrics. We believe that examining samples with stock metrics is important as several studies emphasize that stock returns may be driven by brand equity (Joshi and Hanssens 2004; Mizik and Jacobson 2008). This may lead to higher appreciation potential due to an “investor response effect” that exists beyond the pure sales response effect of branding activities.

In study 2 the influence of the globalness of a brand strategy on brand efficiency is tested. For this purpose we analyze the efficiency scores for global and local brands respectively. To control for potential effects of differences in brand relevance for these brands, we compare global and local brands on each level of brand relevance separately.

To test the moderating effect of brand architecture on brand efficiency we conduct study 3, comparing the efficiency of umbrella brands vs. product brands.

4.2 Measurement of Brand Relevance

Existing studies are explorative in nature or use a single-item measure for the category-related brand relevance only (Fischer et al. 2004; Perrey et al. 2003). Therefore, we develop a measure for the category-related brand relevance following the procedure of van Ittersum et al. (2007). The authors argue that attribute importance (such as the relevance of brands for buying decisions) is a multidimensional concept and that different methods should be used to measure the different dimensions of attribute importance. They distinguish between three dimensions of attribute importance: salience, relevance, and determinance. Salience reflects the degree of ease with which attributes come to mind or are recognized when thinking about or seeing a certain object. Relevance of attributes is largely determined by personal values and desires and reflects the importance of attributes for individuals. The determinance of an attribute reflects the importance of an attribute in judgment and choice. The authors recommend the free-elicitation method to measure the salience, the direct-rating method to measure the relevance and the trade-off method to measure the determinance of an attribute. Therefore, we use all three mentioned methods to capture all dimensions of the relevance of brands for the buying decisions in a product category.

First, we use the free-elicitation technique to get an understanding for the relevant purchase criteria in different product categories (Steenkamp and van Trijp 1997). The free-elicitation method uses an open-ended question to let individuals indicate which decision criteria they believe are important, for instance, when thinking about buying a product. As no attribute information is presented when using this method, it solely relies on people's ability to retrieve internal attribute information stored in memory.

Second, we ask individuals to rate the relevance of brands for their buying decision on a direct-rating scale (Srivastava, Connolly, and Beach 1995). For this purpose, we develop a multi-item measure of brand relevance. Based on the review of existing literature presented above and empirical pre-tests in various product categories we generated five items that capture our understanding of brand relevance. We reveal the influence of the decision criterion "brand" in a product market by asking consumers if in product category X (1) the brand plays an important role compared to other decision criteria (e.g., price); (2) the brand is a very important decision criterion; (3) it is important for them to buy branded products; (4)

they would buy a branded product even if they would have to incur extra efforts; (5) the brand is very important for the purchase decision. The advantage of this measurement model is that it can be assessed using fit measures from exploratory and confirmatory factor analysis.

Third, we validate this measure using a “constant sum scale” which represents a trade-off method (Schori 1995). The constant sum scale produces a ratio measurement which captures the magnitude of a characteristic and scales the differences between alternatives. Constant sum data is obtained by asking the respondent to allocate 100 points across different decision criteria (e.g., price, design, quality, brand etc.) so as to reflect their degree of importance. Here we use category-specific criteria that we derived from the free-elicitation interviews.

Using the direct-rating measurement scale we can classify existing product categories according to their level of brand relevance. Validating our scale with the constant sum measure is appropriate as this method reveals the importance of brands compared to other important criteria. If there is a strong correlation between the rankings of categories according to the mean value of the direct rating method and the average score resulting from the constant sum measure this is strong evidence for the external validity of our brand relevance measure.

4.3 Measurement of Brand Efficiency

To capture the two steps of the brand management chain we use a two-stage Data Envelopment Analysis (DEA) model. DEA is a nonparametric tool that can deal with multiple inputs and outputs when measuring inefficiency. It estimates an efficient frontier by maximizing the weighted output/input ratio of each brand, thus producing a single measure of overall efficiency (Charnes, Cooper, and Rhodes 1978). Efficient brands are those for which no other brand or linear combination of brands can generate as much as or more of the output given the input levels. Each brand’s efficiency is assessed relative to this frontier (Seiford 1996).

For each step of the brand management chain, the transformation efficiency is calculated by solving the fractional programming format:

$$(2) \quad \max \theta_k = \frac{\sum_{r=1}^s u_{rk} y_{rk}}{\sum_{j=1}^m v_{jk} x_{jk}} \quad \text{s.t.} = \frac{\sum_{r=1}^s u_r y_{ri}}{\sum_{j=1}^m v_j x_{ji}} \leq 1; i = 1, \dots, n; u_r \geq 0; v_j \geq 0; r = 1, \dots, s; j = 1, \dots, m.$$

The objective of this model is to maximize the conversion ratio of producing the outputs y_r from the necessary inputs x_j for brand k by fitting the data with different weights for outputs (u_r) and inputs (v_j). All estimated efficiency (θ_k) results are either equal to or less than 1 (100%). Efficient brands (identified as the best practices by DEA) have a score of 1 and form the efficient frontier. The remaining brands have a score between 0 and 1. The portion $(1 - \theta_k)$ represents the inefficient percentage of inputs for brand k , i.e. resources that can be saved with holding the output level constant. DEA is well suited for measuring brand efficiency because of its methodological advantages. First, DEA results are based on comparisons with the most efficient brands that operate under similar situations and scales, whereas simple ratios reflect average performing brands and do not account for heterogeneity. DEA accounts for individual brand differences rather than smoothing out differences based on the means (like in regression). Second, DEA is a mathematical programming that does not require any subjective specifications in weighting the multiple inputs and multiple outputs, whereas simple ratios require such a subjective assumption (Luo and Donthu 2006). Moreover, DEA fits well with the RBV which is fundamentally a theory about extraordinary performers or best practices (Hansen, Perry, and Reese 2004). DEA is such a method and identifies a maximum production frontier and benchmarks brand efficiency at the individual level.

According to the brand management chain the influence of the resources employed by brand management instruments on financial performance is indirect, utilizing psychographic outputs as intermediate factors to generate financial outputs (Keh and Chu 2003). Thus, we recast the brand management chain as a chain of two DEA models. In the first step DEA model we examine the conversion of brand investments into awareness and image. Subsequently, in the second step DEA model it is investigated whether customer-perceived variables are translated into “hard” economic facts efficiently. Such a multi-step model allows insights into the sources of overall brand (in)efficiency. Not decomposing the overall efficiency score would mask whether inefficiency arises from “strategic” aspects (creating superior awareness and image) or from “operative” aspects (capitalizing on awareness and image).

5 DATA AND SAMPLE

5.1 Data and Sample for the Brand Relevance Ranking

In order to obtain a ranking of product categories according to their level of brand relevance we randomly selected 36 business-to-consumer (B2C) product categories from the categories contained in the Consumer Price Index. Following the procedure proposed by van Ittersum et al. (2007) we used free-elicitation technique, a direct-rating scale and a constant sum scale to ensure validity of our brand relevance measure.

(1) Free-elicitation technique

The first stage of the field research involved a series of 160 exploratory interviews to collect qualitative information on purchasing criteria in the 36 categories. Close to shopping malls we randomly selected individuals that were asked to indicate five categories that they recently purchased from. Using an open-ended question the interviewees elicited the attributes that were most important for their buying decision in the selected five product categories. The interviews typically lasted between 10 and 15 minutes, and followed a semi-structured interview format. Similar to the methodology used by Kohli and Jaworski (1990), the interviewers did not use the word ‘branding’ in the interviews. From the total set of identified buying decision criteria, we selected the five most common criteria per category (e.g., price, quality and design) based on an objective count of the number of mentions (≥ 10 times).

(2) Direct-rating scale

In the second stage the five brand relevance statements introduced above were transferred to an online and to an offline questionnaire in order to ensure a representative sample. To ensure that respondents only answered questions about product categories they are familiar with, we first asked them to indicate that categories where they had purchase experiences within the last 12 months. Among these “familiar” product categories four were randomly selected and respondents answered the five relevance questions per category and several questions regarding socio-economic characteristics. For the five brand relevance statements we used a seven-point Likert-scale ranging from “absolutely do not agree” to “absolutely agree”. Brand

relevance within a category is measured as the average value of the index of the five items for all respondents.

3,672 respondents answered the questionnaires. As every respondent rated four product categories we obtained 14,688 evaluations in total, i.e., about 400 evaluations per category. The sample's socio-economic characteristics are as follows: Sex: 47% male; Age: 33% 16-29 years, 37% 30-49 years and 30% 50+ years; Education: 16% had A-Levels and 10% a university degree. Based on the obtained data we conducted exploratory and confirmatory factor analysis indicating excellent fit measures for our brand relevance scale (Cronbach's alpha: .94, Variance Extracted: 81%, χ^2/df : 0.78, RMSEA: .01, NNFI: 1, CFI: 1; SRMR: .022). Thus, we used our scale to calculate the brand relevance score for each category resulting in a brand relevance ranking of the 36 categories shown in Table 1.

(3) Constant sum scale

To validate our brand relevance scale we included a constant sum scale in the online and offline questionnaires consisting of the five most frequently mentioned decision criteria per category including brand (based on the free-elicitation technique). Respondent were asked to allocate 100 points across the five decision criteria (e.g., price, design, quality, brand). As a result we received a relative importance score for the decision criterion brand compared to the four other criteria. To examine the convergent validity we then correlated the importance of brand measured by the two methods across individuals (Stillwell, Barron, and Edward 1983). Correlations above .45 are considered high (van Ittersum et al. 2007). Thus, as we found a correlation coefficient of .67 we consider the convergent validity of our brand relevance scale as very high.

For testing moderating effects of brand relevance the levels of the moderator should be treated as different groups (Baron and Kenny 1986). For grouping categories with respect to brand relevance a third split was used instead of median split as this tends to be more conservative, and if respondents end-pile their ratings, as is common in survey research, then relationships with other variables are harder to detect using median split (Dabholkar and Bagozzi 2002). Thus we divided categories in groups with high, medium and low brand relevance.

Rank	Product Category	Brand Relevance	Rank	Product Category	Brand Relevance
1	Automotive	4.77	19	Shower Gel	3.66
2	Cigarettes	4.66	20	Cellular Phone Services	3.61
3	Sports Shoes	4.53	21	Convenience Food	3.59
4	MP3 Player	4.48	22	Car Repair Services	3.56
5	Power Tools	4.47	23	Sunglasses	3.56
6	Laptop Computers	4.44	24	Furniture	3.49
7	Beer	4.35	25	Desktop Computers	3.41
8	Digital Cameras	4.32	26	Fresh Food	3.38
9	Facial Care	4.24	27	OTC-Drugs	3.11
10	Skin Care	4.10	28	Casual Clothing	3.05
11	White Goods	4.08	29	TV-Channels	2.98
12	Sparkling Wine	4.07	30	Fixed Network Services	2.98
13	Televisions	4.04	31	Detergents	2.92
14	Financial Services	3.97	32	Aircare	2.88
15	Banks	3.95	33	Mineral Water	2.78
16	Softdrinks	3.91	34	Electricity	2.38
17	Business Clothing	3.88	35	Hairstyling Services	2.36
18	Insurances	3.76	36	Toilet Paper	2.07

Table 1: Brand Relevance Ranking

5.2 Data and Sample for the Measurement of Brand Efficiency

For examining brand efficiency we selected the following product categories covering all three groups of brand relevance (high, medium and low), containing local and global brands as well as umbrella and product brands: automotive, digital cameras, notebooks, and white goods showing high brand relevance; televisions, financial services, banks and business clothing reflecting markets with medium relevance and desktop computers, fresh food, casual clothing and electricity reflecting low relevance.

We use 220 brands for 12 categories assuring that for each category the brands cover at least 60% of the market volume. Thus, no major brand is missing in our dataset.

To get the input and output data to model the brand management chain we collected secondary data for the periods 2005 and 2006. For data on communication investments we had access on Nielsen Media Research databases including expenditures for print (newspaper, magazines), broadcast (television, radio) and outdoor (expenditures in more than 300 outdoor plant operator markets). To control for lagged and carryover effects of advertising we used a function of previous period (2005) and current period (2006) expenditures as the communication input (Charnes et al. 1997). As most studies on advertising response modeling found that 90% of all advertising effects dissipate after 15 months at latest (see the review in Vakratsas and Ambler 1999) this time span seems adequate.

For quality costs we used costs of goods sold taken from AMADEUS, a leading company data base similar to COMPUSTAT. This metric reflects all expenditures associated with ensuring that products conform to specifications (Ittner, Nagar, and Rajan 2001) and consists of three types of cost: prevention costs (costs for design/process improvements, engineering, training and high quality material); appraisal costs (costs for inspection and testing to detect quality problems) and internal failure costs (costs for scrapping and reworking defective products).

Distribution costs taken from AMADEUS database refer to the costs for making the product available in a great number of stores in order to offer the brand where and when consumers want it and thus reducing the time consumers must spend searching, providing convenience in purchasing, and making it easier to get services related to the product. Hence, distribution costs encompass costs for outlets, sales force and trade marketing (Smith 1992; Yoo et al. 2000).

Data for image (esteem) and awareness (knowledge) were provided by Young & Rubicam. Esteem reflects the level of regard consumers hold for the brand and valence of consumer attitude. It is measured on a seven-point scale. Knowledge reflects the awareness and the extent to which customers recall and recognize the brand. Young & Rubicam asks respondents to indicate on a seven-point scale their familiarity with a brand, which is explained to include the overall awareness of the brand and the understanding of what kind of product or service the brand represents. Both metrics are part of the Brand Asset Valuator (BAV) database. BAV initiative, the most expensive and ambitious effort to measure brand

equity across products (Mizik and Jacobson 2008), has undertaken large-scale surveys of consumers regarding perceptions of brands on a host of different brand metrics.

Data on product-market performance (sales revenue, EBITDA) and stock-market performance (P/E ratio) were obtained from AMADEUS database and from annual reports. With respect to product-market performance it is important to have “clean” measures when examining the relevant contribution of brand management. That is, we need to tease out the impact of other marketing variables. Following the approach of Ailawadi, Lehmann, and Neslin (2003) and Sriram, Balachander, and Kalwani (2007) we use brand price premium data we obtained from A. C. Nielsen to adjust our product-market outputs.

Note that DEA estimates the efficiency without a priori information on tradeoffs among inputs and outputs (Chen and Agha 2004; Luo and Donthu 2006). Thus, this method is advantageous for our study as we have no prior knowledge about which part of the brand expenditures produces which part of the outputs.

Regarding the sample size of DEA studies necessary for meaningful results, the literature commonly suggests that the amount of observed units (in our case brands) has to be larger than double the amount of the product of the number of inputs and number of outputs. This test is regarded as valid for assessing the appropriateness of datasets for DEA (Dyson et al. 2001). For both steps of the model this condition is fulfilled. To check for potential outliers what is crucial due to high sensitivity of the efficient frontier, we conducted super-efficiency analysis. Brands with abnormal super-efficiency scores extremely push out the frontier leading to biased efficiency evaluations. As all brands’ super-efficiency scores are below the suggested screen level of 1.2 (Banker and Chang 2006) there is no need for removing brands from the dataset. In summary, the DEA results can be expected to be robust and valid (Doyle and Green 1995).

6 RESULTS

We test our hypotheses by comparing average efficiency scores between product categories or groups of brands respectively. It has to be noted that due to the non-parametric nature of DEA, statistical properties of DEA estimators are largely unknown. Therefore, most studies report DEA efficiency results without any evaluation of the significance of the estimates (Kittelsen 1999). This implies that the efficiency is measured without error. However, since these measures are calculated from a finite sample of observations they are liable to sampling error. Recent work by Banker (1996), Kittelsen (1999) and Simar and Wilson (2006) has shown the applicability of statistical tests under specific conditions. Based on Monte Carlo simulations the authors show that with non-nested and independent samples – which we have in our study - the paired t-test performs quite well even in case of small samples.

6.1 Study 1: Testing the Influence of Brand Relevance on Brand Efficiency

As brand relevance reflects several market characteristics and is thus located on aggregated category-level we test the influence of brand relevance by comparing average efficiency scores of brands between categories. For testing the influence of globalness and brand architecture we compare groups of brands (global vs. local and corporate vs. product) across categories.

(1) Test of H_{1a}

On the first step of the brand management chain there is no relationship between the average efficiency score and the brand relevance level of the product categories (see Table 2). While the average efficiency across all high-relevance categories is on a high level (in average 90%) there is no significant difference between categories of medium relevance (average: .63) and categories of low relevance (average: .62). Moreover, there are categories of medium brand relevance (televisions: .94) that have higher efficiency scores than categories of high brand relevance (white goods: .81; notebooks: .92). Even in the category with high brand relevance there is considerable room for improvements (white goods: .81), and at the same time there exist categories with low brand relevance (electricity: .78) where brands are as efficient like

brands in high-relevance categories. The results confirm H_{1a} implying that in the first step of the brand management chain external market conditions as brand relevance have no systematic influence on brand efficiency.

High Brand Relevance	Step 1			Step 2		
	Digital Cameras	Note-books	White Goods	Digital Cameras	Note-books	White Goods
Average efficiency score (all brands)	.97	.92	.81	.93	.92	.90
Average efficiency score (inefficient brands)	.86	.86	.53	.89	.86	.78

Medium Brand Relevance	Step 1			Step 2		
	Financial Services	Business Clothing	Televisions	Financial Services	Business Clothing	Televisions
Average efficiency score (all brands)	.37	.57	.94	.82	.78	.80
Average efficiency score (inefficient brands)	.18	.35	.89	.75	.71	.63

Low Brand Relevance	Step 1			Step 2		
	Fresh Food	Casual Clothing	Electricity	Fresh Food	Casual Clothing	Electricity
Average efficiency score (all brands)	.70	.39	.78	.70	.54	.75
Average efficiency score (inefficient brands)	.58	.19	.68	.65	.63	.71

Table 2: Results for Study 1

(2) Test of H_{1b}

Regarding the second step of the brand management chain all efficiency scores for the high-relevance categories are above the scores of the medium-relevance categories; and all scores of the medium-relevance level are higher than the scores of the low-relevance level. The t-test indicates that with respect to high vs. medium relevance for six of the nine pairs of average efficiency scores the difference is significant on $p < .05$. For the nine pairs of average efficiency scores in the medium vs. low relevance comparison three differences are significant at $p < .01$ and two differences are significant at $p < .05$. These results confirm H_{1b} showing that the efficiency of the input-output-transformation on the second step of the brand

management chain is strongly influenced by brand relevance. As the mean efficiency across all three low-relevance markets (.66) indicate, for the average brand almost 35% of the current values of awareness and image are not converted into financial value, i.e., are wasted inputs. In contrast, in the markets for digital cameras, notebooks and white goods investments in awareness and image are much better reflected in the bottom line.

(3) Comparison of Results for the Inefficient Brands between the Categories

Finally, an analysis of the inefficient brands is relevant for the deduction of managerial implications as well. The efficiency of inefficient brands for step 2 is considerably high in categories with high brand relevance (average: .84). The average is higher compared to the inefficient brands in medium and low level categories. This indicates that it would be relatively easy for all brands in the high-brand relevance sample to reach the efficient frontier. The results indicate a lead of these industries, even with respect to inefficient units. This provides further support for H_{1b} . Our results confirm the assumption that brand relevance is a good basis for determining the optimum level of brand investment since it shows a high predictive validity for the process of converting customer-perceived brand equity into financial performance.

6.2 Study 2: Testing the Influence of Brand Globalness on Brand Efficiency

(1) Test of H_{2a}

In order to separate the influence of globalness we compare global vs. local brands for each brand relevance level (see Table 3). On the first step of the brand chain for each relevance level the average efficiency scores of the global brands are significantly higher than for the local brands: is .10 for high relevance ($p < .1$); .49 for medium relevance ($p < .001$) and .14 for low relevance ($p < .05$). Moreover, the variation of the average efficiency scores within the global brands is low ($SD = .103$) compared to the variation within the local brands ($SD = .32$). These results confirm H_{2a} showing that the efficiency of the transformation in the first step of the brand management chain is significantly influenced by the globalness of a brand.

For global brands there is little room for improvements in the first step even in the product markets with lowest brand relevance. The average efficiency score of .90 indicates that the average brand could reduce spending by 10% ($1 - .90$) while holding the level of outputs (image, awareness) constant. For local brands, there is extensive room for improvement for all product markets considered. The average brand could reduce spending by 35% ($1 - .65$) for a given level of outputs.

Global Brands	Step 1			Step 2		
	High	Medium	Low	High	Medium	Low
Brand Relevance Level						
Average efficiency score (all brands)	.91	.86	.92	.94	.80	.68
Average efficiency score (inefficient brands)	.80	.72	.86	.91	.65	.51

Local Brands	Step 1			Step 2		
	High	Medium	Low	High	Medium	Low
Brand Relevance Level						
Average efficiency score (all brands)	.81	.37	.78	.90	.78	.75
Average efficiency score (inefficient brands)	.53	.18	.68	.78	.71	.71

Table 3: Results for Study 2

(2) Test of H_{2b}

On the second step of the brand management chain the average efficiency scores of global and local brands are quite close for all three brand relevance levels; the pairs of efficiency scores for the high, medium and low-relevance level exhibit no significant differences. Both local and global brands can obtain high efficiency scores in step 2 in markets with high relevance level. In contrast, global brands in markets with low brand relevance do not reach high efficiency despite their global orientation. This provides further support for H_{1b} . Thus, there is no evidence for a moderating effect of a brand's globalness on efficiency in step 2 and thus we have to reject H_{2b} .

(3) Comparison of Results for the Inefficient Brands Between global and local groups

Again, analyzing the inefficient brands gives insightful implications for management. The step 1 average efficiency scores for global brands are at a high level even for inefficient

brands (average: .79). In contrast the inefficient brands of the local set obtain an average efficiency score of only .46 across the three brand relevance levels (significant at $p < .001$). Thus, our results show that for local brands it is very difficult to create high customer based brand equity from the employed brand resources. These findings support H_{2a} , stating that global brands are more efficient in obtaining CBBE through their branding activities than local brands.

6.3 Study 3: Testing the Influence of Brand Architecture on Brand Efficiency

(1) Test of H_{3a}

Again, analyzing the inefficient brands gives insightful implications for management. The step 1 average efficiency scores for global brands are at a high level even for inefficient brands (average: .79). In contrast the inefficient brands of the local set obtain an average efficiency score of only .46 across the three brand relevance levels (significant at $p < .001$). Thus, our results show that for local brands it is very difficult to create high customer based brand equity from the employed brand resources. These findings support H_{2a} , stating that global brands are more efficient in obtaining CBBE through their branding activities than local brands H_{3a} .

	Step 1		Step 2	
	Corporate Brands	Product Brands	Corporate Brands	Mixed Brands
Average efficiency score (all brands)	.86	.57	.72	.68
Average efficiency score (inefficient brands)	.73	.47	.66	.68

Table 4: Results for Study 3

(2) Test of H_{3b}

On the second step no significant efficiency differences between corporate and product brands can be detected ($.72 - .68 = .04$). This indicates that brand architecture has no moderating effect on efficiency on step 2. Thus H_{3b} has to be rejected.

(3) Comparison of Results for Inefficient Brands Between corporate and product brands

Analyzing the differences for the inefficient brands between the two groups shows that corporate brands have a moderate level of .73 on step 1. Consequently, inefficient umbrella brands can reach the efficient frontier much easier than inefficient product brands showing an average efficiency score of only .47 (significant at $p < .01$). Thus, for most inefficient product brands it seems to be a great challenge to get on the efficient frontier. This again provides support for H_{3a} . The rejection of H_{3b} can be confirmed, showing that the average efficiency scores of inefficient corporate and product brands are very close (.66 and .68).

6.4 Robustness Test

To ensure the robustness of the findings extracted above we repeated the analysis for a new data set. This time we focused on publicly traded “mono-brand” manufacturers, in order to check whether our implications are robust when using stock-market based metrics as financial outcomes instead of conventional profitability measures like revenue or EBITDA.

To reflect high brand relevance we used the automotive industry. As the industry for medium brand relevance we used banks and for low brand relevance we used desktop computers. As Table 5 shows, all results from study 1 to 3 are supported by the result of the additional analysis.

Publicly traded brands	Step 1			Step 2		
	Auto-motive	Banks	Desktop Computers	Auto-motive	Banks	Desktop Computers
Brand Relevance Level	High	Medium	Low	High	Medium	Low
Average efficiency score (all brands)	.91	.86	.92	.94	.80	.66
Average efficiency score (inefficient brands)	.80	.72	.86	.91	.65	.51

Table 5: Results of the Robustness Test

The difference of brand efficiency for step 2 between the different categories - representing the three brand relevance levels - is significant: .14 ($p < .05$); .14 ($p < .05$). This provides support for H_{1b} . On step 1, no significant difference is found confirming H_{1a} . Moreover,

arguing that publicly traded brands always are corporate brands, and that the brands analyzed in this study are all operating globally, H_{2a} and H_{3a} are supported, as all categories have high efficiency scores on the first step of the brand management chain. Finally, analyzing the inefficient brands provides further support for the hypotheses H_{1a} , H_{1b} , H_{2a} , and H_{3a} . For step 1 the inefficient brands show a relatively high level of efficiency across all categories, supporting H_{2a} and H_{3a} . For step 2 the efficiency scores of inefficient brands significantly differ between the categories of high, medium and low brand relevance, supporting H_{1b} .

As the overall results in Table 6 show, the ranking of the categories with respect to second step brand efficiency (from high to low) highly corresponds with the brand relevance ranking of the categories. This holds true for almost all categories, analyzed in study 1-3 and the robustness test. Thus, our results are robust with respect to product-category type and types of financial outcome measures.

Product Category	Brand Relevance Score	Average Brand Efficiency Score (Step 2)
Automotive	4.77	.94
Digital Cameras	4.61	.93
Notebooks	4.44	.92
White Goods	4.29	.90
Televisions	4.04	.80
Financial Services	3.99	.82
Banks	3.95	.86
Business Clothing	3.88	.78
Desktop Computers	3.43	.68
Fresh Food	3.20	.70
Casual Clothing	3.18	.54
Electricity	2.38	.75

Table 6: Overall Results

7 DISCUSSION

Brand managers are accountable for the task of getting the most out of brand investments such as communication, distribution and quality investments. Brand investments become increasingly threatened since they entail a large part of the overall marketing costs. The cost of bringing a new brand to market is approximately \$100 million, with a 50 percent probability of failure (Crawford 1993). Thus, it becomes important for brand managers to show the efficiency of their multimillion dollar spending (Rust et al. 2004). A methodologically sound measure of brand efficiency is challenging because firms often target their expenditures to promote multiple outcomes simultaneously, such as both visible sales and stock performance and invisible brand image and awareness.

(1) Theoretical contribution

First, in this paper we answer Rust and colleagues' (2004, p. 83) call for new methodologies "for comprehensively modeling the chain of marketing productivity all the way from tactical actions to financial impact or firm value." We provide a holistic and theoretically sound measure for the efficiency of both steps of the brand management process with efficiency being defined as a multiple-output to multiple-input ratio. In the first step we examined the transformation of brand investments into customer-based metrics (CBBE). The first step model represents the cognitive and affective aspect of brand equity (brand awareness and brand image). Subsequently, in the second step model it has been investigated whether customer metrics have been translated successfully into "hard" financial metrics.

As a second theoretical contribution we develop, test and validate a multi-item measure to assess brand relevance in a product category. This allows analyzing if brands have an impact on consumers' purchase decisions. This measurement model could be used to reveal the antecedents (brand values and product market characteristics) of brand relevance.

(2) Managerial contribution

First, managers can use our brand efficiency concept to benchmark their brand management performance by comparing it to the maximum production frontier which is formed by the

brands that achieve the best input-output-transformation. In addition they can identify the percentage of wasted inputs and the sources of (in-)efficiency.

Second, our results show that global brands are more efficient in obtaining CBBE through their branding activities than local brands. One reason for this is the possibility of generating strong synergies and economies of scale. Another explanation is that efficiently converging brand inputs into brand outputs is a specific capability depending on firm's managerial skills and competencies. Following the resource-based view, these competencies and skills can be gained both internally through knowledge management, training, education) and externally (through brand agencies, consulting firms and often horizontal acquisitions). Global brands have easier and better access to those superior competencies and skills, both internally and externally. Pursuing a globalized branding strategy enables a cross-border transfer of branding expertise and skills within the firm making it easier to implement a "best practice" brand management. Also, learning and experience effects can be accumulated and accelerated through brand standardization. The transfer of these skills between firms can be gained by exerting a strong attraction on high potentials to global firms as well as by benefiting from increased exchange of knowledge between firms through consultants or career changers. Global firms may have more financial resources dedicated to each global brand that enables them to reap the benefits of know-how transfer between firms. This is supported by our results that efficiency within the group of global brands is more homogeneous compared to the group of local brands that shows a significantly higher efficiency variance.

The easier access to superior branding skills - internally and externally - leads to a strong competitive advantage of global firms over local firms and, thus, higher profitability. Since local firms are less mobile they have less access to these skills and capabilities as well as fewer opportunities to benefit of an exchange of skills within the firm.

Third, our results show that brand management for a single umbrella brand seems more efficient than managing several single brands. By distinguishing between the customer and the financial perspective in our two-step framework we are able to locate the sources of this performance advantage of umbrella brands within the first step of the brand management chain. Thus, saving resources and obtaining synergies in brand investments in the process of producing customer-based outcomes are the key advantages of managing umbrella brands.

Fourth, we reveal a significant influence of external market condition as brand relevance has a systematic influence on brand management efficiency. This complements a recent study by Slotegraaf et al. (2003) that requires more research not only on how brand equity can be created but also how it can be deployed in the marketplace. As the results show, firms are equally successful in creating consumer-based assets, i.e. resource possession is not the problem. However, they differ significantly in deploying these assets consistent with market requirements reflected through the level of brand relevance in the product-market they are operating in. Thus, brand relevance should be seen an important metric for determining the optimal extent and allocation of brand investments since it shows a high predictive validity for the efficiency of converting customer-perceived brand equity into financial performance. It should be used as the basis for designing market-driven brand strategies. Our findings show that high brand investments in markets with high brand relevance are accountable while the enormous costs to build up well known brands in markets with low brand relevance have to be scrutinized. In such markets other criteria than brands seem to be the key drivers of consumers buying decisions.

Our measurement model and the understanding of brand relevance provides companies with a more solid basis for determining how much to spend on communication. High communication intensity can only be justified if the level of brand relevance is high. If the level of brand relevance is low, such investments should be reallocated to other marketing parameters. For example, for the energy market brand investments are highly inefficient due to the low significance of brands in this category. Consequently, the use of other marketing parameters would be more beneficial. Our findings do question the recent discussion whether customer equity and brand equity should necessarily be integrated (Ambler et al. 2002; Leone et al. 2006). Instead, we propose that an integrated approach is only appropriate in markets with high brand relevance. From a financial perspective companies in industries with low brand relevance should concentrate on customer equity.

(3) Limitations and Future Research Issues

We acknowledge several limitations of our study which provide fruitful avenues of future research. **First**, our conceptual brand management model could be extended with additional input, output and moderating variables. For example “energy” as a new pillar of the Brand Asset Valuator (BAV) could be integrated. This variable indicates future orientation and

capabilities of the brand; it shows a brand's ability to meet consumers' needs in the future. Thus, brands that score high on this dimension and thus have the ability to adapt changing needs should maintain or even enhance brand management efficiency over time. Thus, another improvement would be to analyze changes in efficiency over time. The results of a dynamic DEA model could be used to test the predictive validity of the "energy" metric. **Second**, with longitudinal studies the influence of changes in competition (e.g., entrance of new competitors) or the development from an emerging to a mature market could be revealed.

Third, our robustness test using stock-market based metrics as financial outcomes could be extended to more markets with publicly traded "mono-brand" manufacturers. Another aspect would be to transfer our model and to test our hypotheses in B2B-markets.

Fourth, category-specific knowledge about brand values as antecedents of brand relevance would be helpful for brand positioning. Brand managers could align brand positioning to that brand benefits that are the specific reasons for using brands as a decision criterion in a category (e.g., risk reduction or hedonic benefits). Communication campaigns could also add elements that emphasize the importance of branding for making superior purchase decisions (e.g., through messages such as "you can always count on brands in this market").

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