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The experimental evaluation of brand strength and brand value

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ABSTRACT

Investments in intangibles, as opposed to things such as plant and equipment, have become more and more critical to the financial performance and growth of organizations. Brands represent an important source of intangible investment. Unfortunately, expenditures for branding are still commonly treated in financial accounting as expenses rather than as investments. There is a movement, however, to treat brands as financial assets. This can be approached directly by evaluating the financial value of a brand based on how strong the brand is in determining consumer choice versus a comparatively weakly branded product. We present a practical approach to evaluating brand strength using discrete choice experiments and estimation techniques that allow for the calculation of the value of brands as financial assets. Treating brands as assets and not expenses can allow companies to align marketing and finance around internal investments and provide outside investors with much needed financial information.

1. Introduction

As Haskel and Westlake (2018) detail, the United States has long since become an intangible economy where things such as R&D, software, and, the focus here, brands account for more economic value than tangibles. They also review evidence that investment in intangibles differentiates high profit companies from less profitable ones. Yet, when it comes to brands, organizations still focus on the cost of branding activities rather than the value created by the brand for the organization. As Lev (2019) contends, management is reluctant to view brands as intangible assets because the value of the asset could be impaired and they would be held accountable. Accountants are reluctant to treat brands as assets because they are difficult to value with traditional GAAP accounting methods. The consequence is that the finance function can be misaligned with marketing in that brand expenditures are monitored as a cost rather than as investment in an intangible asset (Calder, 2019a). There is also misalignment with external investors who do not receive financial information about the brand. As Lev and Gu indicate in their book *The End of Accounting* (2016), this leaves investors lacking important information in making value decisions about equities.

Against this background, Sinclair and Keller (2014, 2017) have made a convincing case for treating brands as financial assets regardless of whether they are acquired or internally developed. Accounting practices presently do not allow the latter and limit the former. Most businesses continue to treat branding activities as expenses (costs), but there is a growing movement to treat them as financial assets (Calder & Frigo, 2019). According to the International Accounting Standards Board (IASB), an asset is defined in accounting terms as a resource controlled by a business from which economic benefit may be expected over time. Clearly, a brand can be such a resource. Brands create value in the mind of the customer. A consumer buys a product with a given objective quality. If in the mind of the consumer the brand she or he buys is associated with positive qualities, the consumer perceives the product as more valuable. If a shampoo is associated with shiny hair and a youthful appearance by virtue of branding activities, then consumer value is created. Marketers often refer to this value to the consumer as brand equity (Keller, 1993). Future returns can be expected from this economic resource in the form of price premiums, greater volume, or cost savings. The finance function, however, tends to focus only on branding activities as opposed to the brand equity that is created. Although brands may be more or less important for any particular organization, where significant brand equity has been created, it is important to evaluate brands as a financial asset and not merely as a cost of doing business. We present a practical procedure for doing so.

As Sinclair and Keller (2014, 2017) point out, treating a brand as a financial asset requires evaluating a brand to determine its value to the company. This value must be “directly and irrevocably linked to the

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utility placed on the brand by the consumers who buy and use it. Marketers call this 'brand strength' (2014, p. 298)."[1] Recently, the International Organization for Standardizations (ISO) has issued a new standard, Brand Evaluation - Principles and fundamentals (ISO 20673, 2019). This standard calls for assessing Brand Strength as a key component of the Brand Value evaluation process.

Marketers already have many metrics (awareness, attitude, purchase intention, NetPromotor score, etc.) to assess brand equity, the value of a brand to the consumer (Farris, Bendle, Pfeifer, & Reibstein, 2006). Many of these metrics, however, are diagnostic rather than evaluative in that they are short-term and do not show the business end-results that CEOs and CFOs care about (Lehmann & Reibstein, 2006). A review of a very large number of studies of brand equity metrics revealed that there is little correlation between different metrics and the average correlation of them with accounting measures of performance is low (Katsikeas, Morgan, Leonidou, & Hult, 2016). Brand equity metrics are all intended to measure the consumer's subjective perceptions and beliefs about what the brand currently means to them. They all reflect the classic marketing idea of brand positioning in the mind of the consumer (Calder, 2010) or the perceived value to the customer (Sexton, 2009). Brand Strength, in contrast, should link the brand equity in the minds of consumers to actual choices in the market (Srinivasan, Hsu, & Fournier, 2012). The Common Language in Marketing Project (2018) defines Brand Strength as "a non-monetary, point-in-time measure which seeks to capture the perceived overall attractiveness in the hearts and minds of consumers that the brand imbues to its offerings *relative to that of other branded offerings (italics added)*." ISO 20673 (2019) follows this definition but explicitly specifies that the concept should be related to Brand Strength (performance), an evaluation of the brand's impact on consumer choices. Brand Strength refers to a consumer's willingness "to pay for a specific brand over and above a baseline comparison absent the brand." [2]

The contribution of this article is to present a new way of evaluating Brand Value using stated preference experimental consumer choice data to estimate Brand Strength. As discussed later, we contrast this with revealed preference methods as well as purely accounting-based approaches such as royalty relief.

The evaluation of Brand Strength is critical to determining the value of a brand as a financial asset, its Brand Value. Brand Strength determines how much of sales is due to the brand. The stronger a brand is, the higher its revenue is. Cash flow is the difference between revenue and the cost of expensed business activities during a specific period of time.[3] Hence holding other aspects constant, a stronger brand results in increased revenue above costs, and thus a larger cash flow. Brand contribution to cash flow is thus the difference between the actual cash flow and what the cash flow would be absent the brand. Brand Value is the discounted value of this contribution over future periods.

At present, there is little guidance for computing Brand Value based on Brand Strength. There are accounting-based methods for brand *valuations* but these either do not take Brand Strength into account or do so using complex proprietary models. Three such methods are in use. A "market method" valuation uses the price of a comparable brand that has been purchased in a market transaction. An "income method" valuation uses the brand's contribution to the net present value of relevant cash flows. A "royalty relief" method is a hybrid based on the royalties a company would have had to pay to license the brand if they did not already own it (market). Future foregone royalties are discounted to present value (income). There are a number of variations of these methods (Paugam, Andre, Philippe, & Harfouche, 2016). Evaluations of Brand Strength can be incorporated into these methods but in practice this is usually done in connection with proprietary models. Highly publicized brand rankings by Interbrand, BrandZ, Brand Finance, European Brand Institute, and many others utilize such models (Salinas, 2016). While these models can be complex, in general they tend to lack transparency (Burmann, Jost-Benz, & Riley, 2009; Raggio & Leone, 2007) are ex-post (Ratnatunga & Ewing, 2009), and have not stimulated wide use in companies for management decision making or in academic research.

Ritson (2015), among others, has strongly criticized the above methods, pointing out that estimates of the brand value of Apple, for instance, differed by $100 billion from the Interbrand estimate of Brand Value to that of BrandZ. Furthermore, there are large differences between Brand Value estimates using these approaches and valuations based on actual cases where purchase price allocation accounting for Brand Value figured into actual business acquisitions. Another issue is that often the perspective taken is not the value to the ongoing operation of the business but rather the market valuation of the brand to outside entities. Such considerations underscore the need to develop a straightforward way of evaluating the financial value of a brand to an organization based directly on how strong the brand is in determining consumer choice.

Thus there is a void between the movement to treat brands as financial assets and fully academic, open-source methods for quantifying Brand Value based on Brand Strength. This article seeks to bridge this gap with a practical approach to evaluating brand strength using stated preference discrete choice experiments and estimation techniques that allow for the calculation of the value of brands as financial assets. In describing our stated preference approach it will be useful to contrast it with another approach, revealed preference, that has received far more attention in the marketing literature. The terminology, stated versus revealed preference, comes from economics. Both approaches seek to go from Brand Strength to Brand Value, but in very different ways. Although revealed preference might, in passing, seem more compelling to marketing and finance executives, we argue that the stated preference approach used here is potentially more promising. In short, the reason for this is that stated preference methods rely on the power of experiments as opposed to observational studies. Even in areas, such as advertising effectiveness, where sophisticated observational methods (e. g., propensity scores) have been used, observational studies can still yield biased estimates of effects (Gordon, Zettelmeyer, Bhargava, & Chapsky, 2019).

After reviewing both approaches we will return to why it is important to quantify Brand Value as a financial asset. We contend that being able to treat brands as assets and not expenses can allow companies to align marketing and finance around internal investments and provide outside investors with much needed financial information. Managerial implications are illustrated in Section 5.

2. Alternative approaches to brand strength and brand value

As noted, there are two general approaches to determining Brand Strength and Brand Value. Both approaches, per the definition of Brand Value, require comparing the evaluated focal brand to a comparison product. To determine the brand asset value, the comparison product should be a weaker brand that provides a baseline benchmark of limited

[1] Brand Strength is sometimes referred to as Brand Performance and the two terms are used interchangeably. Also, Brand Strength is sometimes used to refer to brand equity rather than choice utility (e.g. Grohs, Raies, Koll, & Mühlbacher, 2016; Mühlbacher, Raies, Grohs, & Koll, 2016).

[2] Note that the concept of Brand Strength does not encompass a competitive analysis of how all of the brands in a category affect each other. A focal brand may have higher or lower revenue than a competitive brand. At issue here, however, is, given the focal brand's financial result, how much of this is attributable to its brand, that is, what the financial result would have been without its brand versus what it is with it. If a firm's competitive situation were to change, this would of course affect Brand Strength and Brand Value.

[3] Technically, this refers to operating cash flow which is critical to financial reporting on the cash flow statement that measures the net cash and cash-equivalents being transferred into and out of the business operation. Free cash flow is cash flow net of capital expenditures. In general, the key point here is that cash flow is conceptually the best indicator of an organizations ability to create financial value in the future. (Note that cash flow statement accounting is not done on an accrual basis.)

or no branding activity.[4] Thus the difference between the evaluated focal brand and the baseline, weakly branded product reflects the contribution of the brand to consumer choices. Specifically, we specify Brand Value more precisely using the brand's contribution to cash flow (or revenue) relative to the control at the brand's market transaction price, as shown by the dashed line in Fig. 1. The goal is as far as possible to compare the brand to itself absent the branding. See Fig. 1 for illustration.

It is worth emphasizing that the specification of Brand Strength above is in the form of a counterfactual. It is the difference between the brand's contribution at its nominal market transaction price and that of the comparison product at that same price. The effect of price variation and discounting will be addressed later in our discussion of calculations using financial metrics. The counterfactual asks how much of cash flow would not have occurred without the brand? Or, put another way, how necessary is the brand to cash flow? From a legal perspective, Brand Value is a but-for issue: But for the brand how much would cash flow be?

2.1. Revealed brand preference

The revealed brand preference approach to comparing the focal brand with the control employs actual market data reflecting the actual choices of consumers. A good example of the revealed preference approach is a study by Ailawadi, Lehmann, and Neslin (2003).[5] They used a large sample of brands to look at the revenue premium of a brand compared to an unbranded, private label version of the brand. A revenue premium could result from a brand having either a higher price, greater volume, or both over the comparison product. Only seven percent of the brands did not reveal a revenue premium.

Ailawadi et al. (2003) was a cross-sectional study comparing many brands with a matched unbranded product. For an individual brand, it would be necessary to compare the relationship between cash flow measures and the presence or absence of the brand over time. A regression model in this case relates the dependent variable Y, a cash flow or revenue measure, to marketing-related independent variables.[6] The independent variable of primary interest is brand, and it has two levels indicating whether the brand is the evaluated focal brand or the comparison brand. The other variables represent other factors that could affect the dependent variable, such as price and distribution differences. Brand and price variables are necessary for evaluating brand strength. Other variables are necessary for statistical reasons. These variables must be included so as not to over-estimate the effect of the brand variable. The regression model shown for just brand and price is

$$\begin{aligned} Y &= \text{Intercept} + \alpha\text{Brand} + \beta P + \gamma P \\ &\quad \times \text{Brand} + \text{Other variables} + \text{error term.} \end{aligned} \tag{1}$$

It is estimated using observations over different periods t using the data for both the focal brand and the control. The P in the regressors indicates the price for the corresponding brand.[7] When the observation belongs to the focal brand, the variable Brand equals 1. Hence Eq. (1) becomes

$$Y = \text{Intercept} + \alpha + \beta P_F + \gamma P_F + \text{Other variables} + \text{error term,} \tag{2}$$

where P_F is the price for the focal brand. We compare the above to the absence of the focal brand. That is, when Brand equals 0, Eq. (1) becomes

$$Y = \text{Intercept} + \beta P_F + \text{Other variables} + \text{error term.} \tag{3}$$

The Brand contribution to the dependent variable is thus interpreted as the difference between Eqs. (2) and (3), and equals $\alpha + \gamma \times P_F$, as illustrated in Fig. 1. These parameter values can be estimated with linear regression.

Unfortunately, the revealed brand preference approach faces several problems. First, the variables in the model are likely to be correlated, making the estimation of the effect of the brand difficult. For instance, the variable Brand and the observed Prices are often strongly correlated. As a consequence, the coefficients β and γ can be hard to identify (single out) or their estimates are unstable. Second, failure to include any omitted variables, factors that affect the dependent variable but are not included in the model, distorts the estimates of the brand contribution. This is because the market data on purchases can be influenced by unobservable factors that correlate with the Brand, Price, or other regressors. Another way of viewing this is that the data entails endogeneity in that the error term correlates with the predictors, violating one of the basic assumptions of linear regression. Consequently, the estimates in the regression equation do not represent the marginal change of Y from the marginal change of the regressors. Sometimes these problems can be partially addressed when an instrumental variable is available.[8] However, it is usually hard to find a valid instrument of high quality.

Beyond these statistical issues is a more basic problem, the long and the short of it is that we cannot directly observe brand strengths in market data. The fact is that not all preferences can be expressed in market choices. Some choices are simply not available and thus cannot be observed in market transaction data. The consumer cannot actually choose the control product at the price of the focal brand. This has to be interpolated from the linear regression model.

2.2. Stated brand preference

Instead of the Revealed Preference approach, consumers can be presented with choices, whether available in the market or not, and asked to state their preferences. This is referred to as a choice experiment.

Choice experiments have been used in marketing practice for some time, though typically not for evaluating Brand Value (for an exception

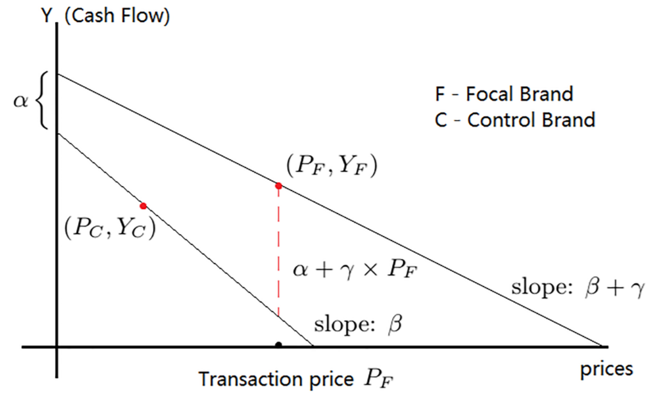

Fig. 1. The contribution of brand strength to cash flow (or revenue). The price and the Y-value of the focal brand has coordinates (P_F, Y_F) and the control has coordinates (P_C, Y_C). The dashed line indicates the difference between the focal brand and the control at the nominal transaction price. It is the difference in cash flow of the focal brand and the absence of the focal brand at the focal brand's transaction price. In terms of a regression model, the intercepts of the two curves differ by α, and the slopes differ by γ. The length of the dashed line equals $\alpha + \gamma \times P_F$.

[4] The selection of the comparison product depends on the specific context of a particular brand evaluation. The concern here is with the general methodology of conducting brand evaluations.

[5] For other revealed preference examples see Srinivasan, Park, and Chang (2005) and de Oliveira, Silveira, and Luce (2015).

[6] Sometimes the log of the cash flow measure is used instead.

[7] Sometimes is used instead of P.

[8] See, for example, Hausman, Leonard, and Zona (1994).

see Ferjani, Jedidi, & Jagpal (2009)). Marketers have long been intrigued with methods of stated preference that decompose preferences over a set of alternatives consisting of brand and other product attributes. Early studies used conjoint measurement techniques asking consumers to rate or rank their preference level for different choice alternatives (e.g., Green & Rao, 1971). These techniques decomposed these stated preferences into brand preference and the preference for each of the other product attributes. Since then, various estimation methods for conjoint analysis have been developed (Green & Srinivasan, 1978). One class of methods focused on monotonically transforming preference rankings and treating the transformed data as utility values. Another method assumed that preference rankings are intervally scaled and could be fitted using regression analysis (thus, unlike the first method, obtaining standard errors for the estimated parameters). Recently, conjoint analysis has evolved toward a third class of methods that are similar to those techniques well-developed in discrete choice estimations, such as Logit and Probit (Hauser & Rao, 2004; Louviere, Flynn, & Marley, 2015; Marley & Pihlens, 2012). Because of such similarity, conjoint is sometimes used as another name for discrete choice models despite the distinctive origins of the two terms (Louviere, Flynn, & Carson, 2010). To avoid any confusion, we will use the term discrete choice rather than conjoint.

Another widely used method (Findley, 2016) simply asks a sample of consumers to choose a brand from a set of brands representing a product category. The Brand Strength of the evaluated brand is the percentage of all consumers preferring this particular brand to the others. Although this method provides a measure of strength and correlates with other marketing metrics, it does not fully capture Brand Strength. It reflects a brand preference for a Focal Brand over all other brands in the category. However, it does not provide a baseline comparison and does not allow price to vary. Hence it does not address our specification of Brand Strength as the difference between the Focal Brand and the control at the nominal transaction price.

The evaluation procedure we present first applies the well-studied logit model to estimate consumer preferences with data from a choice experiment. The logit model describes the probability of a choice using preferences for brand, price and other aspects of the product. These preferences are simultaneously captured in the model using different parameters. We first estimate the model parameters that describe the consumer preference for the focal brand, then use these parameters to obtain the counterfactual cash flow or profits of an unbranded counterpart. From this, we obtain the Brand Contribution to cash flow. The Brand Value is then the discounted present value of Brand Contribution to cash flow, or profit, projected into the future. In summary, our proposed procedure to evaluate Brand Value can be conceptualized in terms of the three major steps given below.

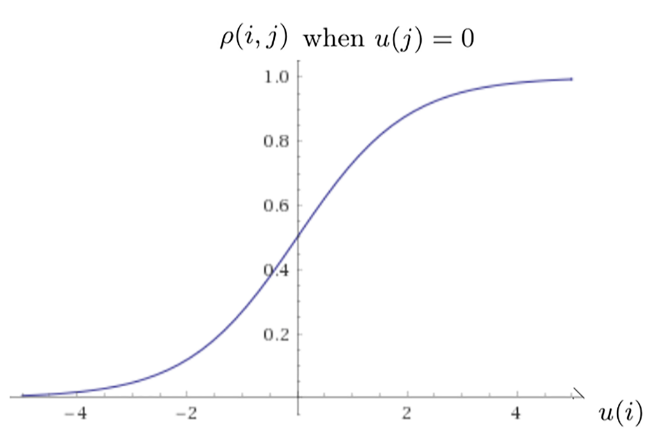

Fig. 2. The choice probability $\rho(i,j)$ when $u(j)=0$ is plotted in the vertical axis, against the utility $u(i)$ of item i in the horizontal axis. When $u(j)=0$, $\exp u(j)=1$. Therefore $\rho(i,j)=\frac{\exp u(i)}{\exp u(i)+1}$ in the figure.

1. Conduct Experiment and Estimation (Sections 3.1 and 3.2)
   - Conduct a choice experiment with a representative sample of target consumers.
   - Use logistic regression to estimate preference parameters for choice probability.
2. Compare Quantity Demanded with/without Brand (Section 4.1)
   - Use Eq. 5 together with current price and quantity demanded to obtain the counterfactual quantiy without the brand.
   - Compare the cash flow with/without brand to obtain brand contribution to cash flow.
3. Evaluate Net Present Value of Brand (Section 4.2)
   - Project the brand contribution to cash flow into the future.
   - Use the income valuation formula to obtain the present value of the projected brand contribution.

3. A logit model for brand choice

Before presenting the details of our procedure, we first review the basic logit model and how we use it to estimate preference parameters. The logit model is widely applied in discrete choice analysis.[9] It states that the probability of choosing an item i is a function of its "utility", $u(i)$, and the utilities of other competing items. Given the utility of other competing items, the higher $u(i)$ is, the more likely i is chosen. In particular, the choice probability of i should satisfy the logistic function as in Fig. 2. This is because when utilities are more equal, changes in the utility tip the probability of choice more than when they are more unequal. Hence the curve is "S"-shaped, rather than linear, implying that the choice probability changes less for very large or very small utility values for i. See Fig. 2 for illustration.

The probability $\rho(i,j)$ depends on the ratio of the exponentiated utility of i to the sum of exponentiated utilities of i and j. The exponential form captures the S-shaped relationship of choice probability to utility of i. The general logistic function for the probability of choosing item i between i and j is

$$\rho(i,j) := \frac{\exp u(i)}{\exp u(i) + \exp u(j)}.$$

Holding the utility of j constant, the higher utility $u(i)$ is, the higher i's choice probability $\rho(i,j)$ is.[10] The expression of ρ implies that $\rho(i,j)+\rho(j,i)=1$. A choice is always made between i and j. To avoid forcing decisions, we can let there be an "outside option" that represents "no choosing". For example, if $j=O$ is the outside option, and $u(O)$ is the utility of not choosing anything among the stated options, then

$$\rho(O,i) := \frac{\exp u(O)}{\exp u(i) + \exp u(O)}$$

is simply the probability of not choosing anything (instead of choosing i). Nonetheless, the logit model implies that the odds ratio between two choices i and j equals $\exp(u(i)-u(j))$, independent of the outside option. Thus, not including the outside option in experiments does not affect our parameter estimation.[11] When we evaluate the Brand Value in Section 4, the model takes into account that the consumer can choose the non-purchase outside option.

[9] It is sometimes referred to as the Luce choice model (Luce, 1959).

[10] The exponentiation serves two other fundamental purposes. First, it tranforms both positive and negative utilities $u(i)$ and $u(j)$ to positive values $\exp u(i)$ and $\exp u(j)$ so that the probability $\rho(i,j)$ is between 0 and 1. Second, the exponentiation preserves order. If $u(i)>u(j)$, then $\exp u(i)>\exp u(j)$ and so $\rho(i,j)>\rho(j,i)$.

[11] For interested readers, further technical properties and justifications of the model can be found in Luce (1959).

3.1. The logit model for estimating brand strength

Suppose we have otherwise equivalent (for our purposes) products branded and priced differently. The utility of each product is affected only by its brand and price. Specifically, the utility of a product i under the brand $B(i)$ with price $P(i)$ is

$$u(i) = \alpha_{B(i)} + \beta_{B(i)}P_i.$$

Here, $\alpha_{B(i)}$ and $\beta_{B(i)}$ are unknown coefficients of the model, and P_i is the price of i in the choice experiment. The symbol $B(i)$ refers to the brand of item i. In the experiment, $B(i)$ either equals F, meaning the Focal Brand, or C, the control. According to this utility function, the utility of i is linear in its price P_i. When i belongs to the Focal Brand, the intercept and the slope are the two coefficients α_F and β_F. The utility function is then $u(i) = \alpha_F + \beta_F P_i$. On the other hand, if i belongs to the Control, the intercept and the slope are two other coefficients α_C and β_C. That is, $u(i) = \alpha_C + \beta_C P_i$.

Because the coefficients can vary across brands, this type of utility function captures both of the two mechanisms through which branding can affect choice probabilities. First, there is a direct effect of the Brand on choice probability through the coefficient α_B. Otherwise identical products would receive different choice probabilities when they are branded differently. Holding other factors constant, the larger α_B is, the higher the probability that brand B is chosen. Second, there is an effect of brand on choice probability through β_B, the coefficient for price.[12] This coefficient measures the changes in choice probability when the price changes. Because a higher price generally leads to a lower choice probability, β_B is a negative coefficient. A brand B with strong preference has a small β_B in absolute value because a slight increase in its price does not have much effect on the choice probability. If the brand B has a weaker preference, its choice probability decreases more due to a change in price. Thus its β_B has a large absolute value. The different coefficients serve a purpose analogous to the interaction term in a linear regression model of Eq. (1). However, through experiments we can measure directly Brand's impact on choice probability and avoid the endogeneity problem. This estimated model is later applied to recover the brand contribution to cash flow.

To summarize, when product i is under brand F at price P_i, and product j is under brand C at price P_j, the choice probability for i over j is[13]

$$\rho(i,j) := \frac{\exp(\alpha_F + \beta_F P_i)}{\exp(\alpha_F + \beta_F P_i) + \exp(\alpha_C + \beta_C P_j)}.$$

As with a linear regression model, the logit model assumes that all relevant variables are included, so it is subject to the same unobserved variables problem. But this problem is mitigated by the experimental context that precludes the effects of outside variables, making it plausible that only Brand and price are affecting choices.

It may seem that the above model uses an aggregate preference parameter to capture the overall probability of choice in the population of interest, and cannot consider heterogeneity within the population. This problem can be addressed by extending the model to capture different types of heterogeneity. For instance, a snack brand such as Planters can sell peanuts, almonds, and more. Each kind of nut can be further divided into salted or unsalted versions. A simple approach to account for such heterogeneity is to include all these attributes in the model by simply adding into the utility more terms for other necessary attributes. Then the model can estimate the brand effect while taking into account the product differentiation. Other non-product attributes, such as whether the product is bought from a supermarket or whether it is a seasonal product can also be similarly taken into account.

The literature also offers an abundance of more sophisticated random utility models to address more subtle heterogeneities such as unobserved product heterogeneity, taste variation, and heterogeneous choice sets. See Baltas and Doyle (2001) for a survey of models of these types of heterogeneity. In practice, one can adopt these models in place of the basic logit model. We will, however, focus on the case of homogeneous products because of its expositional simplicity.

3.2. Experiments and estimations

To evaluate the strength of the focal brand F, a control C is needed. C can be any brand other than F, such as any weakly branded but otherwise comparable (except for price) product, a benchmark competitor brand, an obscure local brand, or a hypothetical brand that does not exist. A hypothetical brand can take a concept test format. For instance, in their choice experiment using yogurt brands, Ferjani et al. (2009) included a hypothetical brand with this description: "Semsem is a new flavored yogurt about to be introduced in the market. Semsem offers the same package size and flavor assortments as the brands currently available in the market. Semsem is the product of a new dairy company." (The name of the hypothetical could vary randomly to avoid any branding cues. A rough graphic rendering of the product could be used to convey a generic quality.) We can also let C be unspecified (such as "store brand"). The selection depends on the decision making context and more than one control could be used for comparative purposes.

In the experiment, we can randomly ask the research participants a series of questions each in the following form.

Which would you choose? Brand F at Price...or Brand C at Price...

In other words, choices are between a product i of brand F at P_i, or a product j of brand C at P_j. For each question, the prices P_i and P_j are chosen to reflect typical market values. To incentivize the research participants, the experimenter can inform them that at the end of the experiment one of the questions answered will be randomly selected. Their answer to that question will be used to select the option for them and the payment will be deducted from their participation compensation. Alternatively, a monitoring tool can be used to ensure the participants' diligence (Permut, Fisher, & Oppenheimer, 2019).

There are many other ways to conduct the experiment. For example, one could use a simulated online selling platform. When consumers are about to purchase a product F (or C), we can prompt them to consider an alternative product C (or F) for a lower price. Or a field experiment could provide randomly selected research participants with one of two coupons that effectively reduces the price for F or C. The relevant data is obtained by tracking which coupons are used. When the coupon is not used, it is understood that the research participant has chosen the outside option.

The idea of using a choice experiment, whether in an online survey or a field study, might strike some as lacking external validity, the ability to apply the results to actual practice. In our opinion, however, such reservations should be tempered by considering that external validity depends on theory as well as data. (Calder, Brendl, & Tybout, 2019; Calder, Phillips, & Tybout, 1983; Calder & Tybout, 2016), and that choice experiments have a foundation in economic theory. Moreover, the problems alluded to earlier associated with using market data and the Revealed Preference approach must be considered as well.

After the observations are collected, the coefficients $\alpha_F - \alpha_C$, β_F, β_C in the logit model can be consistently estimated using standard software packages.[14] That is, we can estimate the difference between the strengths of the direct branding effects on choice probabilities $(\alpha_F - \alpha_C)$ as well as the indirect effects through pricing for each brand β_F and β_C.

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[12] This effect is not taken into account with a simple choice experiment that holds price constant.

[13] Cf. the comparison that specifies brand strength in Fig. 1.

[14] See e.g. Long (1997) for the details on computing the statistics.

4. Brand value as contribution to cash flow

Before evaluating Brand Value using estimated consumer preferences, we need to specify Brand Value in financial terms. Namely, the asset value of a brand equals the present value of the brand's contribution to future cash flows. Since cash flow is the difference between revenue and cost, evaluating Brand Value boils down to evaluating the brand's impact on revenue and total cost to determine cash flow. We first present our procedure in the case when total cost is nearly proportional to revenue. That is, there is a constant marginal cost of production. We will explain later how it would be applied when they are not proportional.

Using the income valuation method, Brand Value can be expressed as

$$\text{Brand Value} = \sum_{t=0}^{H} \frac{\text{Brand Contribution to Cash Flow at } t}{(1+R)^t} + \text{Terminal Value}, \tag{4}$$

where t indexes the time period running into future, H is the time horizon under consideration, R is the discount rate, and the Terminal Value represents the residual value projected at the time horizon. Clearly, one needs to determine the Brand's contribution to cash flow to evaluate the Brand. We define Brand's Contribution to cash flow at t as.

$$\begin{aligned}&\text{Brand Contribution to Cash Flow at } t\\ &:= \text{Cash Flow under } F \text{ at } t - \text{Cash Flow under } C \text{ at } t.\end{aligned}$$

The cash flow under F is readily known or projected. The cash flow under C is unknown. Since cash flow is revenue minus cost, we need to find the revenue under C and subtract its corresponding cost of production. Both of these quantities are determined by the quantity demanded under C. The next subsection explains how this counterfactual sales quantity can be imputed using the estimated logit model from the previous section.[15]

4.1. Comparing quantity demanded with/without brand

For each price level P_i, before purchasing each i at the price P_i, the customer could ex-ante choose i or the non-purchase outside option O. Therefore, each completed transaction is the realization of the probability $\rho(i_F, O)$ where i_F is the product i is branded under F. Brand F's contribution to sales and profit lies in this probability. If the Brand were C, the same i at the same price P_i would be traded under a different transaction probability $\rho(i_C, O)$, where i_C refers to the same product under the Control. This probability leads to a different number of total transactions, causing a change in the total amount of cash flow. This change is then the contribution of Brand to cash flow.

The remaining question is how to determine the amount of cash flow under the choice probability $\rho(i_C, O)$. To do so, we first find for the quantity demanded under Brand F at price P_i the corresponding amount demanded when i is branded as C. Observe that the quantity is proportional to the choice probability. By comparing the probabilities, the above relation is thus

$$\frac{\text{Quantity of } i_C \text{ Demanded}}{\text{Quantity of } i_F \text{ Demanded}} = \frac{\rho(i_C, O)}{\rho(i_F, O)}.$$

Since the two probabilities are not observed from data, we use the estimated parameters $\alpha_F - \alpha_C, \beta_F, \beta_C$ from the logit model together with the following assumption to impute the two probabilities.

Assumption. The marginal cost (MC) for producing an additional product is constant, and the observed retail price of each i_F is set to maximize expected profit.

Constant marginal cost and profit maximization are commonly assumed in economic theory. For our purposes, it can be taken as a benchmark working assumption under which the analysis is performed. Notice that the cash flow is the income net of business expenses, so for our purposes the terms cash flow and profit are used interchangeably.

To see why this assumption is needed, consider the decision problem from the consumer's prospective. Each choice of F's product i is the outcome of comparing the utility value of i_F with the value of the (non-purchase) outside option. The probability of a purchase, $\rho(i_F, O)$, depends on these two values. However, the value of the outside option is typically unobserved. The consumer could have decided to not purchase F due to any other consumption needs, so the probability $\rho(i_F, O)$ is not necessarily its market share. Nonetheless, using the Assumption, we can impute the value of the outside option and deduce the following Proposition. The details of its proof are postponed to the Appendix A.

Proposition. *Under the Assumption, the ratio of the corresponding counterfactual quantity demanded under C to the amount demanded under F at retail price P_i is*

$$\frac{\rho(i_C, O)}{\rho(i_F, O)} = \frac{-\beta_F(P_i - MC)}{-\beta_F(P_i - MC) - 1 + \exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i)}. \tag{5}$$

To interpret the formula, recall that both β_F and β_C are negative. When F is a stronger brand than C, $\beta_C < \beta_F < 0$. Moreover, we have seen that $\alpha_F - \alpha_C$ measures the direct effect of brand on choice. As the brand F is stronger than C, $\alpha_F - \alpha_C > 0$. Therefore, the ratio $\rho(i_C, O)/\rho(i_F, O) > 0$ because $-\beta_F > 0$ and $-1 + \exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i) > 0$. Moreover, holding β_F constant, the stronger F is relative to C, the larger the differences $\alpha_F - \alpha_C$ and $\beta_F - \beta_C$ are. When this is the case, a sale under F would correspond to a smaller amount of sale under C according to the formula.

To impute the cash flow from sales when all products are branded under C, we simply apply the Proposition to find out the corresponding expected quantity demanded under C. Because of constant marginal cost, the cash flow is proportional to the quantity demanded and thus it holds that

$$\begin{aligned}&\text{Cash Flow under } C \text{ at } t\\ &= \text{Cash Flow under } F \text{ at } t \times \frac{\text{Quantity of } i_C \text{ Demanded}}{\text{Quantity of } i_F \text{ Demanded}}\\ &= \frac{-\beta_F(P_i - MC) \times \text{Cash Flow under } F \text{ at } P_i \text{ at } t}{-\beta_F(P_i - MC) - 1 + \exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i)}.\end{aligned}$$

Because the Brand F's contribution is defined by the difference between cash flow under F and the cash flow under C, we have

$$\begin{aligned}\text{Brand Contribution to Cash Flow at } t &= \text{Cash Flow under } F \text{ at } t\\ &\quad - \text{cash flow under } C \text{ at } t\\ &= \text{Cash Flow under } F \text{ at } t\\ &\quad \times \frac{\exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i) - 1}{\exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i) - \beta_F(P_i - MC) - 1}.\end{aligned}$$

4.2. Evaluating brand contribution

When we observe the quantity and price for the product i_F at time t, the above calculation can be directly applied to obtain the Brand Contribution to cash flow. The Brand Value is the present value of future contribution to cash flow. Hence we need to project past Brand Contribution into the future. One can project past prices, costs (MC), and quantities into future time t, and obtain the projected future Cash

[15] Before we present the model, one complication should be noted. It arises when aggregate revenue reflects different price levels, so that it must be decomposed into subtotals of revenue for each price level. For example, a revenue of \$100 million might be composed of \$80 million at price \$10 and \$20 million at a discounted price of \$8. In this case, we need to consider the revenue from each price level, and apply the choice probability to each price level to recover the total contribution of the Brand.

Flow under F at t. Then by assuming preference parameters $\alpha_F - \alpha_C$, β_F and β_C remains stable in the near future, Brand Contribution at future time t can be computed the same as above. That is,

$$\text{Brand Contribution to Cash Flow at } t = \text{Cash Flow under } F \text{ at } t \times \left(1 - \frac{\rho(i_C, O)_t}{\rho(i_F, O)_t}\right) = \frac{\text{Cash Flow under } F \text{ at } t \times (\exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i(t)) - 1)}{\exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i(t)) - \beta_F(P_i(t) - MC(t)) - 1}.$$

Here $P_i(t)$ and $MC(t)$ are the projected period t price and marginal cost.

Substituting this expression into the basic formula for Brand Value gives the value of the Brand from Eq. (4)[16]

$$\text{Brand Value} = \sum_{t=0}^{H}\left(\frac{\text{Cash Flow under } F \text{ at } t}{(1+R)^t} \times \left(1 - \frac{\rho(i_C, O)_t}{\rho(i_F, O)_t}\right)\right) + \text{Terminal Value}.$$

The terminal value can be treated as a perpetuity, a constant cash flow over multiple periods forever. Its present value can be obtained by dividing the period cash flow by the discount rate (Damodaran, 2011).

A more sophisticated approach is the Perpetuity Growth approach. It uses the formula

$$\text{Terminal Value} = \frac{1}{(1+R)^H}\frac{D_H(1+g)}{R-g}$$

where D_H is the Contribution to Cash Flow in the Hth period future, and g is the long run growth rate (Gordon & Shapiro, 1956).

5. Managerial implications

This section illustrates the calculation of the contribution of Brand to cash flows at time t. Suppose the total revenue at t is \$100 million from sales of brand F. The composition of the revenue from sales is 10 million units at unit price \$10, out of which \$9 is per product cost. The total profit was calculated to be \$10 million.

A choice experiment is run with a representative sample of target consumers.[17] Suppose from the experimental data, the logit regression coefficients are estimated to be $\alpha_F - \alpha_C = .5$, $\beta_F = -0.2$ and $\beta_C = -0.25$. We use the formula in the Proposition to express the ratio of the sales quantities in terms of the price and the parameters estimated,

$$\frac{\text{Quantity Demanded under } C}{\text{QuantityDemandedunder} F} = \frac{-\beta_F(P_i - MC)}{-\beta_F(P_i - MC) - 1 + \exp(\alpha_F - \alpha_C + (\beta_F - \beta_C)P_i)}.$$

Suppose projected prices and costs remain the same. We can substitute in the same numerical values to obtain the amount of sales at \$10 under control C,

$$\frac{0.2 \times (10-9)}{0.2 \times (10-9) - 1 + \exp(.5 + (-0.2 + 0.25) \times 10)} \times 10 \text{ mil} \approx 1.04 \text{ mil}.$$

Hence, absent brand F, the revenue from selling at price level \$10 is approximately

$$1.04 \text{ mil} \times \text{"\$"}10 = \text{"\$"}10.4 \text{ mil},$$

with profit being \$1.04 mil. Therefore at t, the Brand F's contribution to profit is approximately

$$\text{"\$"}10 \text{ mil} - \text{"\$"}1.04 \text{ mil} = \text{"\$"}8.96 \text{ mil}.$$

Fig. 3 shows, holding everything constant but β_F, the Brand contribution to profit for different values of β_F in $[-0.35, 0]$. The larger β_F is, the stronger brand F is. As β_F increases, a larger amount of profit is attributed to Brand F.

Alternatively, Fig. 4 shows that the Brand contribution to revenue for $(\alpha_F - \alpha_C)$ ranges from $[-.7, 1]$, holding all others constant. Similar to Fig. 3, the strength of the brand increases as the value of $\alpha_F - \alpha_C$ increase. In both figures, when a brand is too weak, its contribution to profit can be negative. See Fig. 3 and 4 for illustration.

From the example above, Brand's contribution to profit is \$8.96 million. To evaluate the Brand, suppose this \$8.96 million contribution is projected over the next 5 years. The discounted present value of the contribution is then

$$\text{Brand Value} \approx \sum_{t=0}^{4}\frac{\text{"\$"}8.96 \text{ mil}}{1.05^t} = \text{"\$"}40.73 \text{ mil}.$$

The above valuation exercise is computed under the assumption that all costs of business comes from production where the marginal cost of production is fixed. Because of this, the Cash Flow is proportional to Quantity Demanded, and so the Brand contribution to cash flow is simply

$$\left(1 - \frac{\text{Quantity Demanded under } C}{\text{Quantity Demanded under } F}\right) \times \text{Cash Flow under } F.$$

In the more general situation where there is a high fixed cost in business operations together with a constant marginal cost, the same formula applies. The profit maximizing price would remain the same because fixed cost is irrelevant for pricing.[18] Therefore, the imputed outside value and the choice probability for branded or unbranded products remain the same in our analysis. The Proposition and Eq. (5) still apply in obtaining the quantity demanded for the unbranded product. It remains to check the computation of cash flow absent brand F. Since the profit is the same fixed percentage of revenue minus the same fixed cost, the difference between the profit under F and under C is just the difference between the fixed percentage of the revenues. However, if we consider the fixed costs to be different under F versus under C, then the Brand Contribution to profit should have another component that accounts for the difference in the fixed costs.

If even the marginal cost depends on the quantity demanded, we can still approximate it with a constant marginal cost so long as the derivative of marginal cost with respect to quantiy is low enough. In that case, the analysis in Section 4 can still approximate well the quantity demanded for the unbranded product. The difference is only in the computation of cash flow absent brand F. It is now computed simply by subtracting from revenue under C the fixed cost and the total cost of production for the quantity sold under C. The Brand Contribution to cash flow is still the difference between cash flow under F and the cash flow under C. The Brand Value follows from applying the present value formula to the difference.

6. Conclusion

Once a quantitative estimate of Brand Value, based on evaluating the Brand Strength of the focal brand against a baseline or benchmark comparison product is obtained, both marketing and finance can make better investment decisions. The general goal of finance is to allocate assets to secure the best financial return on investments and reduce risk.

[16] This expression implicitly assumes the cash flow is proportional to the sales, holding other variables constant. When cash flow (or equivalently, the total cost of production) is a constant fraction of revenue, the assumption would be automatically satisfied. If this assumption does not hold, the cash flow should be adjusted according to its relationship with revenue.

[17] If different markets or market segments are of interest, a choice experiment could be run for each one.

[18] Notice that when there is only a fixed cost but no marginal cost, profit maximization is equivalent to revenue maximization. Under profit maximization, the fixed cost does not affect pricing decisions and is only relevant for entry/exit decisions.

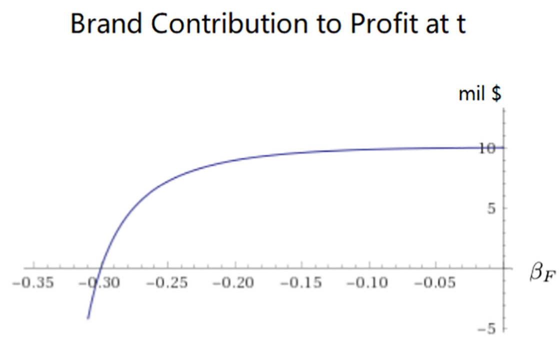

Fig. 3. The Brand Contribution to Profit at t. The higher the price, the smaller the choice probability, so the coefficient β_F for price is negative. At the extreme when $\beta_F = 0$, the Brand is extremely strong in the sense that increasing its price does not decrease its choice probability. When β_F is close to 0, all the profit is attributed to the brand. On the other hand, if β_F is too negative, the probability of choice decreases significantly with a tiny price change. When this is the case, the brand's contribution can be negative. That is, the brand is hurting profit and the control C would have generated greater profit than F.

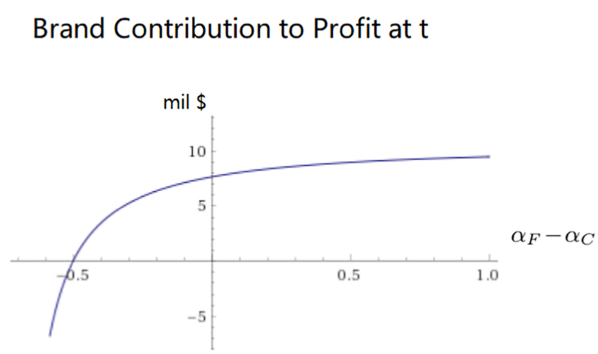

Fig. 4. The Brand Contribution to Profit at t. The difference $\alpha_F - \alpha_C$ represents the strength of F relative to C at a fixed price. The larger the difference, the more likely that brand F is chosen over C. As $\alpha_F - \alpha_C$ increases, a larger amount of the profit is attributed to the brand F, and asymptotically all the profit of 10 mil is attributed to F in the limit. On the other hand, as $\alpha_F - \alpha_C$ gets smaller, a smaller amount profit is attributed to F. When $\alpha_F - \alpha_C$ becomes too negative, a negative amount of profit is attributed to F, implying F is so weak that it causes a loss of profit.

Currently, financial executives treat brands as an expense and often regard marketing budgets with a skeptical eye (Calder, 2019a). Marketers may try to justify expenditures with marketing mix and attribution models, but this often only reinforces the idea that brand expenditures are expenses that must be justified in the current budgeting cycle. Focusing on Brand Value would enable marketing and finance to view branding more strategically— taking the point of view of the brand's contribution to the business as a whole over time. This would put internal investments in brands on a much better footing in allowing marketing to focus on long-term customer engagement (Calder, 2019b). Evaluating Brand Value over time would make it clear whether such investments are creating value for the enterprise or not. Funds could be allocated accordingly.

Take the example of the company that has a 100 million dollar brand in sales, with a cash flow of \$10 million. Say that the proposed marketing budget for the next year was \$7 million, and this was a 30 percent increase over the last year. The negotiation between marketing and finance would typically be tense. Finance would typically worry that the added cost would hurt cash flow.

Think how different the discussion might be if it centered on the value of the brand evaluated, as above, to be over \$40 million. If both marketing and finance realized that one of their most important assets in terms of generating cash flow was Brand Value, the proposed budget would look much more like a good investment than a cost. Of course, the investment is only as good as the potential return in Brand Value, but this is what the discussion should be about.

Periodically evaluating Brand Value could also enhance the organization's ability to attract capital. Currently, quarterly earnings reports play too great a role in the decisions of external investors. Market capitalizations need to better reflect intangible assets rather than traditional balance sheets, which have grown less and less related to stock prices over time (Madden, 2016). Accountants are wary of putting intangibles such as Brand Value on the balance sheet, but Brand Value could be reported using notes or via Integrated Reporting, a growing movement to make non-traditional financial information widely available. One has only to look at the way brands are presently described in annual reports to realize that investors would be better served by real information about the value of brands. Evidence supports that investing in strong brands yields above market returns to investors (Fornell, Morgeson, & Hult, 2016; Madden, Fehle, & Fournier, 2006).

Implementing the concept of evaluating brands in order to treat them as financial assets in making investment decisions will, of course, require empirical research. There is a need to test alternative analytical formulations. The model presented here is intended as a starting point and benchmark for further developments. Joint efforts by practitioners and academics should prove fruitful in the movement to realize the value of brands.

Appendix A. Proof of the Proposition

Proof. For each realized sales of an item i under the brand F, let P_i be the actual transaction price. Meanwhile, denote the outside option value as $U(O)$. By assumption, P_i maximizes the expected profit

$$\rho(i, O) \times (P_i - MC) = \frac{\exp(\alpha_F + \beta_F P_i)}{\exp(\alpha_F + \beta_F P_i) + \exp(U(O))} \times (P_i - MC).$$

The first order condition states that P_i solves the equation

$$\exp((\alpha_F - U(O)) + \beta_F P_i) + \beta_F (P_i - MC) + 1 = 0.$$

By rearranging the equation, we write $U(O)$ as

$$U(O) = \alpha_F + \beta_F P_i - \ln(-\beta_F (P_i - MC) - 1).$$

Now substitute in the logit functional form of $\rho(,)$,

$$\frac{\rho(i_C,O)}{\rho(i_F,O)}=\frac{\frac{\exp(\alpha_C+\beta_C P_i)}{\exp(\alpha_C+\beta_C P_i)+\exp(U(O))}}{\frac{\exp(\alpha_F+\beta_F P_i)}{\exp(\alpha_F+\beta_F P_i)+\exp(U(O))}}=\frac{1+\exp(U(O)-\alpha_F-\beta_F P_i)}{1+\exp(U(O)-\alpha_C-\beta_C P_i)}=\frac{1+\exp(-\ln(-\beta_F(P_i-MC)-1))}{1+\exp(\alpha_F-\alpha_C+(\beta_F-\beta_C)P_i-\ln(-\beta_F(P_i-MC)-1))}$$

$$=\frac{1+(-\beta_F(P_i-MC)-1)^{-1}}{1+\exp(\alpha_F-\alpha_C+(\beta_F-\beta_C)P_i)\times(-\beta_F(P_i-MC)-1)^{-1}}=\frac{-\beta_F(P_i-MC)}{-\beta_F(P_i-MC)-1+\exp(\alpha_F-\alpha_C+(\beta_F-\beta_C)P_i)}.\quad\square$$

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