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How Brand Attributes Drive Financial Performance

Natalie Mizik and Robert Jacobson

How can managers better assess the dynamic impact of the brand asset on firm financial performance? Using stock return response modeling, this study links brand-building outcomes to current and future accounting performance and firm value.

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Report Summary
Quantifying financial returns on brand-building initiatives is a critical marketing challenge. Here, authors Mizik and Jacobson develop a model that links outcomes of brand-building initiatives (brand differentiation, relevance, quality, familiarity, and vitality) to current and future accounting performance and to firm value.

Using stock return response modeling, they examine the effect of changes in each brand asset component, as well as changes in an aggregate brand asset measure, on accounting performance (i.e., earnings) and stock market valuation. Their dataset includes 275 publicly traded firms in which a single brand represents the bulk of the firm's business.

They find that brand assets influence stock return both directly and indirectly (by impacting current earnings, which in turn affect stock returns). Among their findings:

- A one-unit change in the Brand Asset Index is associated with a 4% change in the market value of a firm.
- Only about 1/3 of the effect of brand assets on financial performance is reflected in current-term earnings; 2/3 reflects information about future-term performance.
- The brand asset components reflecting relevance and vitality have direct effects on stock returns incremental to current-term earnings.
- The brand asset components of quality, familiarity, and differentiation impact stock returns indirectly through their effects on current earnings.

This study provides a framework for assessing the dynamic impact of the brand asset, and its components, on firm financial performance. ■

Introduction

Accounting measures alone cannot adequately explain firm value. Oftentimes firms have intangible assets or undertake strategies whose benefits are not accurately depicted in accounting valuation of firm assets or in current-term accounting measures of financial performance (Srivastava, Shervani, and Fahey 1998). For example, marketing assets such as brand attributes and brand-building strategies have benefits not reflected fully in current-term performance outcomes. In fact, some brand-asset-building initiatives require significant investments that negatively affect current-term financial results. Further, different brand initiatives generate differing financial returns (and some may not justify their costs).

The issue of quantifying the returns to marketing activities in financial terms is one of the great challenges facing marketing and brand managers (Rust et al. 2004). In the absence of adequate valuation and performance measurement, brand-enhancement initiatives may be replaced by initiatives of potentially lower value, but with more quantifiable financial implications. Marketing managers must determine which branding initiatives generate firm value (and quantify their effects) and which do not.

The question of how to value brand assets is unresolved. Brands are commonly assessed by customer mindset measures, e.g., awareness and attitudes. However, such measures do not translate into dollar values and thus are unappealing for financial valuation purposes (e.g., Ailawadi, Lehmann, and Neslin 2003). Alternative brand asset valuation approaches that link brand attributes to the bottom line have been proposed. For example, performance decomposition and extrapolation methods (such as "earnings split analysis") attempt to split current product-market outcomes (e.g., earnings, sales, or profits) to isolate a brand's contribution. These approaches have their own limitations, which we will discuss later.

In this study we link the outcomes of brand-building initiatives (i.e., customer perceptions of brand assets) to current and future financial performance and to firm value. We develop a model that links customer mindset measures to financial market valuation and to accounting performance measures. The resulting measurement and assessment of brand assets satisfy most of the criteria of an ideal brand measure, e.g., it is grounded in theory, diagnostic, objective, reflective of future value, etc., (MSI 1999). This approach is undertaken both with a single aggregate brand measure and with separate brand asset components so that the financial value implications of separate brand asset components can be determined.

Linking the Brand Assets to Firm Value

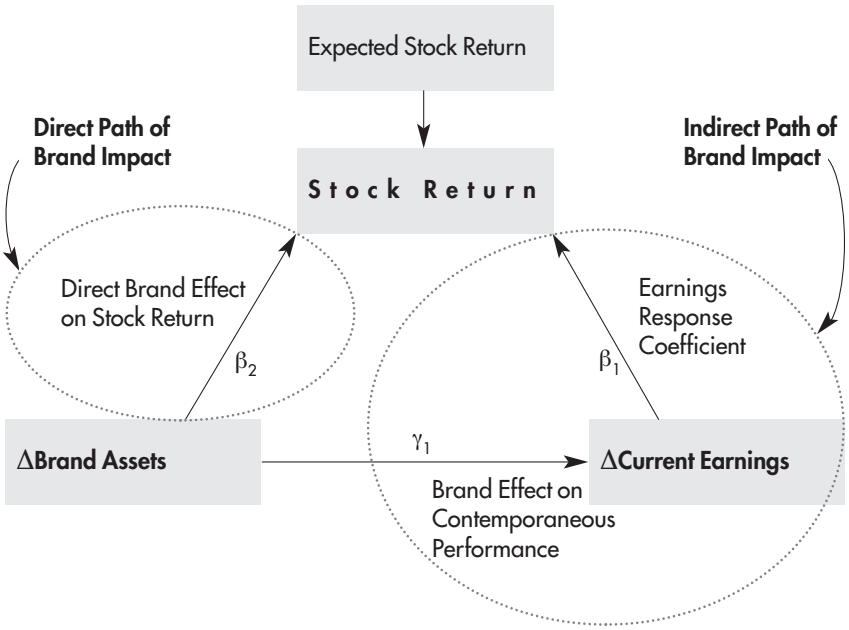
Figure 1 provides a simplified overview of the framework for our analysis. The stock market valuation of a firm depicts market expectations of the discounted value of its future cash flows. Under the hypothesis of financial market efficiency, this expectation provides an unbiased estimate of the value of a firm. Unanticipated earnings change investors' expectations of the firm's current and future cash flows and hence lead to a change in a firm's valuation.

In an attempt to anticipate future-term outcomes, however, stock market participants also use other information. Brand assets are hypothesized to affect stock return simultaneously through two mechanisms: direct and indirect. The indirect mechanism stems from the effect of brand assets on *current* earnings. All else being equal, firms with greater brand assets can be expected to have greater current-term earnings. Since increased earnings change investors' expectations of the firm's current and future cash flows (as described above), brand assets thus indirectly lead to a change in a firm's valuation.

However, brand assets may also influence market valuation directly. This would be the case if brand assets have delayed or lagged effects on

Figure 1

The Dynamic Performance Impact of Brand Asset: Modeling Framework



earnings, i.e., the effect of the brand asset is not fully reflected in current-term accounting performance. To the extent that these effects on future earnings are present, brand assets would contain information incremental to contemporaneous accounting performance measures in explaining the financial markets valuation of a firm.[1] In other words, the financial markets anticipate the presence of lagged brand assets effects, and adjust their expectations of future cash flows above and beyond their expectations of future cash flows based on unanticipated current earnings. As such, changes in brand assets induce changes in stock market value incremental to those generated by a change in current earnings.

This basic framework summarizes the approach that we use, i.e., stock return response modeling, for assessing the total value of the brand asset and its components.[2] Equation 1 is a stock return response model that posits the direct and indirect effects of changes in brand assets on firm valuation.

$$StkRet_{it} = Eret_{it} + \beta_1 U\Delta AccP_{it} + \beta_2 U\Delta BrandAsset_{it} + \varepsilon_{it} \quad (1)$$

where $StkRet_{it}$ is the stock return for firm i at time t, $Eret_{it}$ is expected return, $U\Delta AccP_{it}$ is the unanticipated change in accounting performance, and $U\Delta BrandAsset_{it}$ is the unanticipated change in the brand asset.

The coefficient β_1 is the earnings response coefficient. It depicts the effect of unanticipated changes in earning (i.e., earning shocks) on stock return and is an estimate of the total cumulative discounted earnings expected to be generated per dollar of unexpected earning occurring in the current period. The link between unanticipated measures of accounting performance and firm valuation has been extensively studied in accounting research.[3]

The coefficient β_2 depicts the direct effect of unanticipated changes in the brand asset on stock returns. Significant values of β_2 would imply that the brand asset measure provides incremental information to contemporaneous accounting performance in explaining financial market value. The coefficient β_2 does not capture the total effect of brand assets; as described above, the brand can also have an indirect effect on stock returns through its impact on accounting performance. To model this indirect effect, we estimate the following model:

$$U\Delta AccP_{it} = \alpha_i + \gamma_1 U\Delta BrandAsset_{it} + \gamma_2 U\Delta BrandAsset_{it-1} + \eta_{it} \quad (2)$$

The coefficients γ_1 and γ_2 respectively depict the contemporaneous and one-period lagged effects of the brand asset on accounting performance.

Under the efficient markets hypothesis, the stock price incorporates all available information pertaining to firm profitability. As such, the financial markets react only to current-term information that alters investor expectations of

cash flows. An "indirect effect" of brand assets exists to the extent that changes in brand assets have a contemporaneous effect on changes in accounting performance, which in turn influence stock return. Any lagged effect of brand assets on accounting performance would not be included in the price of the stock under the efficient market hypothesis. As such, the *indirect effect* of brand assets on stock return equals $\beta_1{}^*\gamma_1$. Thus the total effect of the brand asset on stock return, which is the sum of the direct plus indirect effects, is equal to $(\beta_1{}^*\gamma_1 + \beta_2)$.

Equations 1 and 2 depict the components comprising a firm's brand asset as having a homogeneous effect on performance. However, the brand asset components may well have differential effects. Modifying equations 1 and 2 allows for separate effects for each brand asset component. That is,

$$StkRet_{it} = Eret_{it} + \beta_1 U\Delta AccP_{it} + \sum_{k=1}^{K}\beta_{2k} U\Delta BrandAsset_{kit} + \varepsilon_{it} \quad (3)$$

$$U\Delta AccP_{it} = \alpha_i + \sum_{k=1}^{K}\gamma_{1k} U\Delta BrandAsset_{kit} + \sum_{k=1}^{K}\gamma_{2k} U\Delta BrandAsset_{kit-1} + \eta_{it} \quad (4)$$

where $U\Delta BrandAsset_{kit}$ is the unanticipated change in the *k*th brand asset component.

Previous Research

Our study has commonalities with Aaker and Jacobson (1994), Barth, Clement, Foster, and Kasznik (1998), and Aaker and Jacobson (2001). These studies link a brand asset measure (or a component of the brand asset) to stock returns, and seek to determine whether the measure provides incremental explanatory power to accounting performance measures in explaining stock returns.

Aaker and Jacobson (1994) used the EquiTrend database of Total Research Corporation (now part of Harris Interactive) to assess the information content of the dimensions of perceived quality and salience. The analysis was based on data for 34 consumer product firms for the three-year period 1990-1992 (i.e., 102 observations). They found that perceived quality provided incremental information to earnings in explaining stock returns. Salience was found not to have a significant effect. Mizik and Jacobson (2004) extended the study to include additional firms and time periods and found similar results.

Barth, Clement, Foster, and Kasznik (1998) assessed the information content of a brand equity measure generated by Financial World and a sample of 183 firms with data for some or all of the 1992-1996 period (a total of 404 pooled time-series cross-sectional observations). To form their brand asset measure, Financial World assumed earnings in excess of a 5% pre-tax return on capital to be brand-induced earnings, and multiplied this figure by a "brand strength" factor to obtain brand value. They found that the Financial World brand equity measure provided incremental information to that depicted in size-adjusted net income in explaining stock returns.

Aaker and Jacobson (2001) investigated the information content of a brand attitude measure supplied by Techtel Corporation. They used quarterly data for 11 high-technology firms that had data available for all or some of the period 1988, quarter 4, through 1996, quarter 4 (206 observations). They found that changes in brand attitude were significantly related to stock returns. They explained this association by reporting that lagged brand attitude was significantly related to changes in return on equity. The association between brand attitude and stock returns was interpreted as stemming from the stock market participants' realization that brand equity leads return on equity.

Each of these studies focused on aggregate measures of brand asset or one brand asset component. Aaker and Jacobson (1994, 2001) found significant effects for one brand component,

Table 1

Brand Metrics Data Timeline

This table presents the timeline of the Y&R Brand Asset Valuator brand metrics data used in our study and the number of mono-brand publicly traded firms we were able to identify in each wave.

Data Collection Wave	Time Period	Number of Observations
1	3rd quarter 1993	116
2	1st quarter 1997	186
3	2nd quarter 1999	209
4	4th quarter 2000	209
5	4th quarter 2001	263
6	4th quarter 2002	267
7	4th quarter 2003	263
Total		**1,513**

i.e., perceived quality and attitude towards the brand, respectively. It is unclear what other dimensions had information content and whether their inclusion in analysis would have altered findings: since brand asset components are likely correlated, their bivariate analysis may exhibit omitted variable bias. A limitation of the analysis using the Financial World brand measure is that it is unclear what brand asset components, if any, this measure reflects. Other factors besides the brand contribute to earnings exceeding 5% of capital. Further, the multiplier used by Financial World includes "non-standard" brand dimensions (i.e., dimensions not generally accepted as being components of brand equity, e.g., nature, volatility, and size of the market a firm operates in).

Our study differs from this previous work most notably in that it is a more comprehensive analysis of brand asset components and their impact on financial performance. We model and assess the dynamic performance implications of several brand asset components. Our study focuses on a multidimensional brand asset measure and enables us to isolate the potential effects of individual components. By having individual measures of brand attributes, we are able to assess the sources of brands' financial impact and to quantify the impact of individual brand attributes on firms' contemporaneous and future financial performance.

Data and Measures

We used three sources to compile our dataset: (1) Y&R's Brand Asset Valuator database for measures of brand perceptions and attitudes, (2) the University of Chicago's Center for Research in Security Prices (CRSP) data tapes for stock re-turns information, and (3) Standard and Poor's COMPUSTAT data tapes for accounting performance measures.

Y&R brand metrics

Since 1993, Y&R's Brand Asset Valuator initiative has undertaken surveys of consumers regarding perceptions of brands on 56 different brand metrics. The frequency of data collection has not been constant and has increased over time. We used surveys undertaken in 1993, 1997, 1999, 2000, 2001, 2002, and 2003, i.e., seven waves. Table 1 presents the list of data collection waves with the corresponding calendar dates, which vary in time intervals from 4 to 14 quarters. Rather than data at, for example, time period t and $t + 1$, we have data for waves w and $w + 1$, with unequally spaced time between waves. Our models, therefore, need to be expressed in terms of wave w rather than time period t. For example, equations 1 and 2 need to be re-expressed as:

$$StkRet_{iw} = Eret_{iw} + \beta_1 U\Delta AccP_{iw} + \beta_2 U\Delta BrandAsset_{iw} + \varepsilon_{iw} \quad (5)$$

$$U\Delta AccP_{iw} = \alpha_i + \gamma_1 U\Delta BrandAsset_{iw} + \gamma_2 U\Delta BrandAsset_{iw-1} + \eta_{iw} \quad (6)$$

We restrict our analysis to "mono-brand" publicly traded firms, i.e., firms where a single brand represents the bulk of the firm's business. We were able to identify 275 of these "mono-brands" in the Y&R surveys. These firms include, for example, AT&T, Coca-Cola, Disney,

Krispy Kreme, Microsoft, Reebok, Starbucks, Wal-Mart, and Yahoo. Customer mindset measures of the brands are available for all or some of the seven survey waves.

Brand Asset Components and Brand Asset Index. What components comprise a firm's brand assets? Keller and Lehmann (2003) comment that "customer mindset includes everything that exists in the minds of customers with respect to a brand (e.g., thoughts, feelings, experiences, images, perceptions, beliefs, and attitudes)" (p. 28). Although different conceptualizations emphasize different aspects of customer mindset, there are similarities across most popular conceptualizations of brand assets. For our analysis we focus on five fundamental brand attributes or components: perceived differentiation, relevance, quality, familiarity, and vitality. The first four components have been frequently used to conceptualize and measure brand assets. We have included the fifth component—brand vitality, the brand's perceived ability to meet customer needs in the future—which has not been previously emphasized.[4] The Y&R database provides survey responses that can be used to construct measures for each of these components.

Differentiation, the ability of the brand to stand apart from its competitors, is a central component in all conceptualizations of brand assets. We constructed a Differentiation measure based on responses to two questions in the Y&R survey which asked respondents to indicate whether they perceived the brand as "unique" and whether they perceived the brand as "distinctive." We formed our Differentiation measure as the average of the proportion of respondents who indicated that the brand was unique and the proportion of respondents who indicated the brand was distinctive.

Differentiation is of little value unless the brand is relevant to the customer, and most brand asset conceptualizations include a measure that seeks to assess the relevance (i.e., the personal appropriateness) of the brand. Y&R asks respondents to rank a brand's relevance on a 7-point scale, ranging from 1: "not at all relevant" to 7: "extremely relevant." We use this as our measure of Relevance.

Perceived quality reflects the extent to which customers believe the brand is reliably delivering a high performance relative to its promises and to competitive offerings. Y&R's respondents were asked to indicate whether they felt a brand was "high quality" or not. We used the proportion of those who responded favorably to this question as our measure of Quality.

At its most basic level, brand familiarity encompasses brand awareness and the extent to which customers recall and recognize the brand. The Y&R measure asked respondents to indicate on a 7-point scale their familiarity with a brand, which was explained to include overall awareness of the brand as well as understanding of the product or service the brand represents.

A fundamental brand attribute that may not be tapped by these four components relates to a brand's ability to fulfill customer present needs and future promises as well as to attract new customers. We label this construct "brand vitality." Customers are likely to value more highly, and build stronger relationships with, those brands that they expect to be able to satisfy their future needs. A brand's ability to adapt and to respond to changing customer tastes and needs in a timely fashion are important aspects of this construct. As such, a brand's innovativeness and dynamism would seem central to this construct. Two Y&R questions, measured as the proportion of respondents who viewed the brand as "innovative" and the proportion of respondents who viewed the brand as "dynamic," relate to a brand's vitality. We take the average of these two sets of responses to form our brand Vitality measure.

Since these five brand asset components are measured on different scales, to form an aggregate brand asset measure, we first z-standardize each of the five brand asset components, i.e.,

each standardized component has a zero mean and unit variance. We then compute an aggregate single measure of a firm's brand assets as an equally weighted sum of these *z*-standardized brand asset components. Since the components may have differential effects on financial value, we regard this aggregate measure as an index rather than a scale. We label it the "Brand Asset Index."

Unanticipated Brand Assets. Since the stock market reacts only to unexpected information, explanatory factors in stock return response models should reflect only unanticipated changes in the measures. Typically, time-series forecasts are used as a proxy measure of market expectations and the residuals from a time-series model serve as the estimates of the unanticipated components of the series. We find that the stock market's perceptions of the brand asset's dynamics are reasonably well represented by random walk.[5] As such, we use the difference in the brand asset measures between waves as the measure of the unanticipated components, i.e., we compute the unanticipated Brand Asset Index as $U\Delta BrandAsset_{iw} = BrandAsset_{iw} - BrandAsset_{iw-1}$ and for each of the *k* brand asset components we compute $U\Delta BrandAsset_{kiw} = BrandAsset_{kiw} - BrandAsset_{kiw-1}$.

Accounting performance

We use the primary, full coverage, and research COMPUSTAT databases to obtain quarterly accounting data for 1988-2003 (quarterly data allows us to line up the accounting measures to correspond with the Y&R data collection waves). We use data prior to the first survey so as to allow for more data points for estimation of the time-series model used to calculate our estimates of unexpected accounting performance. For our accounting performance measure, we use (Operating Income Before Depreciation /Assets). This measure has information content that is comparable or superior to other accounting measures.

In order to obtain a measure of unanticipated accounting performance, we estimate a time-series model and use the residuals as the estimates of the unanticipated components. We find that quarterly accounting performance in our data sample is best approximated by a fixed-effect, fourth-order autoregressive model adjusted for time-period-specific effects. That is, we use a model of the form:[6]

$$\begin{aligned}(AccP_{iq} - \overline{AccP_q}) = \alpha_i &+ \phi_1^*(AccP_{iq-1} - \overline{AccP_{q-1}}) + \\ &\phi_2^*(AccP_{iq-2} - \overline{AccP_{q-2}}) + \\ &\phi_3^*(AccP_{iq-3} - \overline{AccP_{q-3}}) + \\ &\phi_4^*(AccP_{iq-4} - \overline{AccP_{q-4}}) + \varepsilon_{iq} \end{aligned} \quad (7)$$

where $AccP_{iq}$ is the value of the accounting performance series for firm *i* in quarter *q*, $AccP_{iq-1}$, $AccP_{iq-2}$, $AccP_{iq-3}$, and $AccP_{iq-4}$ are its lagged values, and $\overline{AccP_q}$ is the mean for $AccP_{iq}$ series in quarter *q*. Equation 7 indicates that the deviation of a series from the economy-wide mean depends on a firm-specific amount and the extent to which the series deviated from the economy-wide mean during each of the previous four quarters. The coefficient α_i is the firm-specific constant and ϕ_k is the k^{th}-order autoregressive coefficient depicting the persistence of the series.

We use ε_{iq} as our measure of the unanticipated component of accounting performance for firm *i* in quarter *q*. For a given wave *w*,

$$U\Delta AccP_{iw} = \sum_{q=k}^{l} \varepsilon_{iq},$$

where $U\Delta AccP_{iw}$ is the cumulative unanticipated change in the accounting performance between wave $(w-1)$ and wave *w* for firm *i*, *k* is the first quarter after wave $(w-1)$ date, and *l* is the quarter when the wave *w* survey takes place.

Stock return

The CRSP data files provide monthly stock returns data for our mono-brand firms for the 1993-2003 time period (monthly returns data allows us to line up the measures of stock returns to correspond with the Y&R data collection waves). We calculate continuously

compounded stock return for firm and wave as

$$StkRet_{iw} = \log(\prod_{m=k}^{l}(1 + ret_{im})),$$

where $StkRet_{iw}$ is firm i's stock return between wave $(w-1)$ and wave w, ret_{im} is the holding period return for firm i in month m, k is the first month after wave $(w-1)$ date, and l is the last month in the quarter when the wave w survey takes place.

Stock return is influenced by economy-wide factors and by firm-specific risk characteristics. These effects need to be controlled for so as both to reduce potential omitted variable bias and to increase power in the analysis. To capture expected return, we include time-period-specific intercepts and time-varying Fama and French (1993, 1996) risk factors: lagged size, as modeled by $\log(Market\ Value_{iw-1})$, and lagged book-to-market equity, as modeled by the $\log(Book\ Value_{iw-1} / Market\ Value_{iw-1})$. Equation 5, for example, becomes:

$$StkRet_{iw} = \beta_1 U\Delta AccP_{iw} + \beta_2 U\Delta BrandAsset_{iw} + \sum_{w=1}^{W}(\gamma_{1w} + \gamma_{2t}{}^{*}\log MV_{iw-1} + \gamma_{3t}{}^{*}\log BMV_{iw-1}) {}^{*}Wave_{w} + \varepsilon_{iw} \quad (8)$$

Merged brand, stock return, and accounting data

Merging the three datasets yielded an unbalanced pooled cross-sectional time-series panel of 750 observations. We do not have complete data available for all firms for all the years in our sample, i.e., our sample is unbalanced. In order to minimize any potential survivorship bias and to preserve the degrees of freedom, we did not impose the restriction of only including firms with a complete dataset in the sample. Thus, the sample size varies across waves and across the different models we estimate.

Table 2 provides descriptive statistics for the variables used in our analysis. Our sample represents a wide cross-section of firms that vary significantly in terms of brand characteristics, size, and profitability. These firms are not representative of the population as a whole, or even of publicly traded firms. In particular, they are on average considerably larger and have higher levels of brand attributes than a typical U.S. firm. Our sample is heavily weighted towards the leading firms and brands in the country. While this reduces the ability to generalize our findings, some universality can be expected and firms in our sample are of importance in their own right.

Table 3 provides bivariate correlations for the variables. Note that most of the bivariate correlations are significant. Changes in brand measures, accounting performance, and stock returns tend to move in the same direction, which is consistent with all the measures reflecting changes in firm value. At issue is whether differential information is contained (1) between the Brand Asset Index (and its components) and accounting performance and (2) among the brand asset components. Are the potential effects of brand assets on stock return being fully reflected in accounting performance or do brand assets contain incremental information to accounting performance in explaining financial returns? Our empirical analysis seeks to address this issue.

The correlation among brand asset components stems from at least three possible sources. One is a "halo" effect: when one component of a brand changes, perceptions of other components may change as well. Second, brand asset changes may not focus just on one component; strategic changes may be undertaken across several components. Third, changes in one component may influence changes in other components as well, i.e., the components of the brand asset may be causally inter-related. For these and other reasons, we expect and observe correlation among the brand asset components. This correlation still allows for unbiased estimates of the coefficients and their standard errors, but it may result in standard errors of a larger size that may make it difficult to isolate and separate out individual effects. The relatively large number of observations in our study will help diminish this problem.

Table 2
Descriptive Statistics

Panel A. Brand Metrics Descriptive Statistics

This table presents the descriptive statistics of the raw brand metrics data as recorded in the Y&R Brand Asset Valuator database for the set of mono-brand publicly traded firms we were able to identify. Number of observations is 1,513.

Brand Asset Measure	Mean	Stdv	10%	Median	90%
Differentiation	8.60	3.93	4.57	7.76	13.59
Relevance	2.74	.86	1.70	2.60	4.10
Quality	25.81	12.27	10.74	24.39	43.64
Familiarity	3.66	1.39	1.57	3.98	5.27
Vitality	8.09	4.22	3.64	7.22	13.48
Brand Asset Index		3.40	–4.32	–.08	4.38

Panel B. Accounting and Stock Return Descriptive Statistics

This sample includes all available 1988-2003 quarterly COMPUSTAT data for those firms that were tracked in the Y&R Brand Asset Valuator database and were also listed in CRSP for at least some time during the 1993-2003 period. Variable definitions with respective COMPUSTAT data numbers are presented below the table.

	# obs.	Mean	StdError of the Mean	10%	Median	90%
Operating Income ($M)	12,789	593.38	10.84	9.21	176.00	1,410.00
Sales ($M)	14,578	3,491.05	54.14	114.52	1,397.59	7,954.00
Total Assets ($M)	14,166	25,773.69	614.70	378.65	5,373.12	52,856.75
Market Equity	14,104	19,143.26	340.26	597.71	5,322.53	48,328.85
AccP	12,553	.0437	.0003	.0094	.0404	.0802
CRSP Monthly Stock Return	32,356	.0173	.0007	–.1195	.0134	.1535

Variable Definitions with respective COMPUSTAT data numbers

$Operating\ Income_{it} = (data21)_{it}$

$Sales_{it} = (data2)_{it}$

$Total\ Assets_{it} = (data44)_{it}$

$Market\ Equity_{it} = Number\ of\ Shares\ Outstanding_{it}\ *Stock\ Price_{it} = (data14)_{it}\ *(data15)_{it}$

$$AccP_{it} = \frac{Operating\ Income\ before\ Depreciation_{it}}{Total\ Assets_{it}} = \frac{(data21)_{it}}{(data44)_{it}}$$

Estimation Methodology

As detailed in Table 1, the Y&R surveys generating the data used in our analysis were not taken at equally spaced time intervals. This feature of the data structure presents some methodological issues in estimating equations 6 and 8.

An error-component model with heteroscedastic disturbances

Least squares estimation of Equation 8 will provide unbiased estimates of the coefficients. However, the estimates may not be asymptotically efficient. Two considerations in particular suggest the need for generalized least squares

Table 3

Brand Metrics Correlations with Financial Performance Measures

This table presents the correlations of the changes in the brand metrics data as recorded in the Y&R Brand Asset Valuator database with stock returns and unanticipated changes in operating income for the set of mono-brand publicly traded firms we were able to identify. Correlations are presented as Pearson correlation coefficients (significance) number of observations.

	StkRet	**Δ*Op Inc***	**Δ*BAInx***	**Δ*Diff***	**Δ*Rel***	**Δ*Qual***	**Δ*Famil***	**Δ*Vital***
StkReturn	1.0							
	1,494							
Δ*Operating Income*	.339	1.0						
	(.000)							
	1,031	1,046						
Δ*Brand Asset Index*	.119	.093	1.0					
	(.000)	(.008)						
	1,122	806	1,235					
Δ*Differentiation*	.058	.078	.706	1.0				
	(.052)	(.028)	(.000)					
	1,122	806	1,235					
Δ*Relevance*	.066	.062	.616	.182	1.0			
	(.027)	(.078)	(.000)	(.000)				
	1,122	806	1,235	1,235	1,235			
Δ*Quality*	.170	.104	.519	.441	.261	1.0		
	(.000)	(.003)	(.000)	(.000)	(.000)			
	1,122	806	1,235	1,235	1,235	1,235		
Δ*Familiarity*	.137	.055	.447	.108	.400	.223	1.0	
	(.000)	(.117)	(.000)	(.000)	(.000)	(.000)		
	1,122	806	1,235	1,235	1,235	1,235	1,235	
Δ*Vitality*	.168	.047	.702	.413	.139	.401	.091	1.0
	(.000)	(.183)	(.000)	(.000)	(.000)	(.000)	(.001)	
	1,122	806	1,235	1,235	1,235	1,235	1,235	1,235

estimation. First, we have multiple observations by firm, which suggests the appropriateness of a random-effects error-component model. Second, the variance of the error is likely to differ by wave because, for example, the wave intervals are of different lengths, i.e., varying from 4 to 14 quarters. This suggests that the error term in Equation 8 will take the form: $\varepsilon_{iw} = \mu_i + \nu_{iw}$, where $\mu_i \sim (0, \sigma^2_{\mu})$ and $\nu_{iw} \sim (0, \sigma^2_{w})$.
The variance term σ^2_{μ} reflects the multiple observations per firm, which we treat as homoscedastic. The main departure from the standard random-effects error-component model is that rather than assuming homoscedasticity, we allow for heteroscedastic disturbances based on differential variance across waves, i.e., σ^2_{w} varies by wave.

A number of different estimation procedures have been advanced, which typically yield similar but not identical finite sample estimates. Following, for example, Baltagi and Griffin (1988), we make use of a two-step procedure to construct a feasible GLS (FGLS) estimator that is based on estimation of heteroscedasticity

under repeated observations (Oberhofer and Kmenta 1974). The basic premise underlying the approach is that least squares estimation provides consistent estimates of the regression coefficients, which in turn will generate residuals having the same asymptotic properties as those computed from the true disturbances (Greene 2003). As such, we use the OLS residuals as the basis for forming an estimate of the variance-covariance matrix, which we then incorporate in the second phase, the conventional error-components estimation. The FGLS estimator based on this estimated matrix has the same asymptotic properties as the GLS estimator.[7]

Unequally spaced observations in dynamic models with lagged or carry-over effects

For estimating Equation 6 we also use a heteroscedastic error-components model and follow the procedure outlined above. The unequal data collection intervals, however, present an additional issue in estimating delayed effects for the brand variables in our unanticipated earnings model (Equation 6).[8] Since the intervals between waves are different, the estimates of the coefficients for lagged terms will differ across waves as a consequence. For example, γ_2 will reflect a one-year lagged effect for waves where the time interval between waves is one year but will reflect long-term effects when the interval between waves is more than one year. To overcome this problem, we limit our analysis here to waves whose interval between the surveys is "close" to one year: waves 5, 6, and 7 only. Of potential concern is that the changes in the brand asset variables between wave 4 and wave 3, which come in as lagged values in the wave 5 observations, is over six quarters. This six-quarter difference can be viewed as providing an estimate of the four-quarter difference, but with error. As such, this might induce a small bias in the estimated effect of γ_2. The estimates of γ_1 will not be affected since all the data for the contemporaneous terms are in exact one-year alignment and the autocorrelation between the unanticipated brand asset measures is zero. This means that our estimate of the total effect of Brand Asset on stock return will not be biased since only γ_1, but not γ_2, enters into the calculation of the total effect.

Empirical Analysis

The first phase of the analysis involves estimating a fixed-effect, fourth-order univariate time-series model for accounting performance. We use this model to generate unanticipated components of accounting performance. Table 4 reports the estimation results. The dominant element in the model is the fourth-order coefficient of .575, which reflects the quarterly seasonality common across firms. We use the sum of the quarterly residuals within a given wave as the estimate of the unanticipated component of *AccP* for that wave.

In order to assess the information content of the Brand Asset Index measure, we regress stock returns on unanticipated *AccP* and unanticipated Brand Asset Index, controlling for expected return via annual dummy variables and firm-specific risk factors. Equation 5.1 in Table 5 reports the results of this estimation.

The significant estimated coefficient for unanticipated *AccP* (3.95) indicates that the financial markets react favorably to information contained in the measure. The information contained in $U\Delta AccP$ induces stock market participants to update their expectations about the firm's discounted future earnings and revise stock price accordingly. This effect is consistent with an extensive literature in accounting that has documented the information content of size-adjusted earnings measures. The point estimate, however, is somewhat higher than that reported previously, e.g., Kormendi and Lipe (1987) report an estimate of 3.38. This difference may well stem from the characteristics of the firms in our sample. These firms tend to be well-established firms with relatively persistent earnings, as evidenced by the autoregressive parameters reported in Table 4. The more persistent the earnings, the larger the expected earnings response coefficient. When a shock to *AccP*

Table 4

AR(4) Fixed Effects Model

$$(AccP_{iq} - \overline{AccP}_{q}) = \alpha_i + \phi_1{}^*(AccP_{iq-1} - \overline{AccP}_{q-1}) + \phi_2{}^*(AccP_{iq-2} - \overline{AccP}_{q-2}) + \phi_3{}^*(AccP_{iq-3} - \overline{AccP}_{q-3}) + \phi_4{}^*(AccP_{iq-4} - \overline{AccP}_{q-4}) + \varepsilon_{iq}$$

Results of estimating the forecast model for accounting performance. To obtain estimate of the parameters ϕ, we use the Anderson and Hsiao (1982) procedure to estimate autoregressive coefficients in the presence of a fixed effect. That is, we take first differences of the data to remove the fixed effect and then form an instrumental variable estimate of $[(x_{iq-1} - \overline{X}_{q-1}) - (x_{iq-2} - \overline{X}_{q-2})]$ using $(x_{iq-2} - \overline{X}_{q-2})$ and $(x_{iq-3} - \overline{X}_{q-3})$ as instruments. This procedure generates consistent (i.e., asymptotically unbiased) estimates of the parameter ϕ_1. Standard errors are in parentheses, *t*-statistics in brackets.

ϕ_1	.107 (.024) [4.53]
ϕ_2	–.015 (.013) [–1.13]
ϕ_3	–.067 (.009) [–7.32]
ϕ_4	.575 (.008) [74.00]
# of observations	**10,356**
***F*-statistic**	**2,081.73**

occurs, investors view it as containing information not only about changes in current-term results but also about future-term prospects. The longer the earnings shock is expected to persist into the future, the greater the weight the financial markets give to its implications for future performance.

Direct effect of Brand Asset Index on stock return

The estimated coefficient for the change in the Brand Asset Index (.027) is also statistically significant. This indicates that market participants view information contained in the brand measure as providing useful, non-overlapping information to unanticipated *AccP* about the future-term prospects of the firm. That is, the brand asset measure captures information incremental to accounting performance in explaining stock returns. This information content arises from a lagged relationship existing between the Brand Asset Index measure and $U\Delta AccP$ and/or the Brand Asset Index measure capturing performance information not contained in the accounting measure. In terms of relative explanatory power, the standardized regression coefficient for unanticipated Brand Asset Index (.07) is substantially below that of unanticipated *AccP* (.36). The Brand Asset Index is not a substitute for accounting performance measures or as reflective of future-term performance, but it does have significant explanatory power for stock returns.

Indirect effect of Brand Asset Index on stock return

An indirect effect arises if the Brand Asset Index has an effect on current-term accounting performance $U\Delta AccP_{iw}$, which, as shown in Equation 5.1 of Table 5, influences financial market valuation. In order to assess this indirect effect, we estimate a model linking unanticipated *AccP* to current and lagged changes in brand assets. Equation 5.2 of Table 5 reports these results.

Both current and lagged Brand Asset Index have positive (.0036 and .0043, respectively) and statistically significant effects on $U\Delta AccP$. The significant current effect indicates that the Brand Asset Index indirectly affects stock return via its effect on current-term accounting performance. The significant lagged effect indicates that the effect of the Brand Asset Index is not immediately and fully captured in the current-term operating performance outcomes, and illustrates why brand assets have an incremental, direct effect on stock return in Equation 5.1. It takes time for the full effect of brand-building activities to be realized. Market partic-

ipants adjust their profit expectations in anticipation of the future-term effect of brand assets on operating performance, and not just when the effect on performance is actually realized.

The contemporaneous effect of brand assets on $U\Delta AccP$ indicates that the total effect of brand assets on stock return includes both the direct effect reported in Equation 5.1 of .027 and an indirect effect running through the influence of brand assets on $U\Delta AccP$ of .014 (i.e., .0036*3.95). As such, the total effect of brand assets is .041; a one-unit change in the Brand Asset Index is associated with a 4.1% change in the market value of a firm. Comparing the magnitude of the direct effect to the indirect effect indicates that 66% of the brand asset effect on stock return is direct; 34% is indirect (i.e., arising through the impact of brand assets on contemporaneous accounting performance). In other words, on average, only about 1/3 of the brand effect is reflected in *current-term* accounting measures; 2/3 is affecting *future-term* performance and, as such, is providing incremental information to accounting measures in explaining firm valuation.

The direct effects of brand asset components on stock return

The Table 5 results are based on the implicit assumption that changes in the five brand asset components each have an equal impact on stock return. To assess potential differential impacts, we regress stock return on changes in each of the five components of the brand asset, again controlling for unanticipated *UAccP*, economy-wide factors, and firm-specific risk factors. Equation 6.1 of Table 6 reports the results of this analysis.

Two brand asset components, Relevance and Vitality, have positive and statistically significant effects on stock return (.101 and .072, respectively). The effects of Relevance and Vitality have comparable influences, as evidenced by similar standardized regression coefficients of .060 and .074, respectively. The financial markets view increases in Relevance and Vitality as

Table 5

The Information Content of the Brand Asset Index

Results of estimating the effects of Brand Asset Index on stock return and operating income shocks. Equation 5.1 also includes (1) annual dummy variables so as to capture the effects of economy-wide factors, and (2) annual effects for log(Market $Value_{iw-1}$) and log($Book\ Value/Market\ Value$)$_{iw-1}$ to capture firm-specific risk factors, i.e., the risk factors are allowed to have effects that vary by year. Equation 5.2 also includes annual dummy variables to capture annual, economy-wide differences. $U\Delta AccP_{iw}$ = unanticipated $AccP_{iw}$. $\Delta BrandAsset_{iw} = BrandAsset_{iw} - BrandAsset_{iw-1}$. Standard errors in parentheses; *t*-statistics in brackets.

Equation 5.1 (# of observations = 750)

$$Stkr_{iw} = 3.95^{*}\ U\Delta AccP_{iw} + .027^{*}\Delta BrandAsset_{iw} + \varepsilon_{3,iw}$$
$$(.291) \qquad (.010)$$
$$[13.59] \qquad [2.58]$$

Equation 5.2 (# of observations = 466)

$$U\Delta AccP_{iw} = .0035^{*}\Delta BrandAsset_{iw} +$$
$$(.0012)$$
$$[2.96]$$
$$.0043^{*}\Delta BrandAsset_{iw-1} + \varepsilon_{3,iw}$$
$$(.0013)$$
$$[3.27]$$

providing a signal about the future-term prospects of the firm, which is incremental to that reflected in accounting performance. The three other components, Differentiation, Quality, and Familiarity, have statistically insignificant effects. The hypothesis that the five components have equal effects can be rejected at the 5% significance levels. As such, this result suggests that information is being lost in the aggregation of the five components into a Brand Asset Index.

Indirect effects of brand asset components on stock return

Their lack of significance in the stock return response model does not necessarily imply that perceived Differentiation, Quality, and Familiarity do not impact stock returns. Rather, no direct

Table 6

The Information Content of Brand Asset Dimensions

Results of estimating the effects of brand asset components on stock return and operating income shocks. Equation 6.1 also includes (1) annual dummy variables so as to capture the effects of economy-wide factors, and (2) annual effects for log(*Market Valuei*$_{w-1}$) and log(*Book Value/Market Value*)$_{iw-1}$ to capture firm-specific risk factors, i.e., the risk factors are allowed to have effects that vary by year. Equation 6.2 also includes annual dummy variables to capture annual, economy-wide differences. $U\Delta AccP_{iw}$ = unanticipated $AccP_{iw}$, $\Delta Differentiation_{iw} = Differentiation_{iw} - Differentiation_{iw-1}$, $\Delta Relevance_{iw} = Relevance_{iw} - Relevance_{iw-1}$, $\Delta Quality_{iw} = Quality_{iw} - Quality_{iw-1}$, $\Delta Familiarity_{iw} = Familiarity_{iw} - Familiarity_{iw-1}$, $\Delta Vitality_{iw} = Vitality_{iw} - Vitality_{iw-1}$. Standard errors in parentheses; *t*-statistics in brackets.

Equation 6.1 (# of observations = 750)

$$Stkr_{iw} = \underset{(.29)\ [13.62]}{3.96} * U\Delta AccP_{iw} - \underset{(.025)\ [-.77]}{.019} * \Delta Differentiation_{iw} +$$
$$\underset{(.047)\ [2.13]}{.101} * \Delta Relevance_{iw} - \underset{(.036)\ [-.13]}{.005} * \Delta Quality_{iw} +$$
$$\underset{(.73)\ [1.25]}{.091} * \Delta Familiarity_{iw} + \underset{(.026)\ [2.80]}{.072} * \Delta Vitality_{iw} + \varepsilon_{3,iw}$$

Equation 6.2 (# of observations = 466)

$$U\Delta AccP_{iw} = \underset{(.0030)\ [1.46]}{.0044} * \Delta Differentiation_{iw} +$$
$$\underset{(.0033)\ [2.27]}{.0075} * \Delta Differentiation_{iw-1} +$$
$$\underset{(.0055)\ [.46]}{.0025} * \Delta Relevance_{iw} + \underset{(.0063)\ [1.99]}{.0126} * \Delta Relevance_{iw-1} +$$
$$\underset{(.0044)\ [2.65]}{.012} * \Delta Quality_{iw} + \underset{(.0051)\ [.53]}{.0027} * \Delta Quality_{iw-1} +$$
$$\underset{(.0085)\ [1.98]}{.0168} * \Delta Familiarity_{iw} - \underset{(.0082)\ [-.58]}{.0047} * \Delta Familiarity_{iw-1} -$$
$$\underset{(.0031)\ [-1.03]}{.0032} * \Delta Vitality_{iw} + \underset{(.0036)\ [.61]}{.0022} * \Delta Vitality_{iw-1} + \varepsilon_{3,iw}$$

effect exists. An indirect effect may still be present to the extent that these components influence current-term accounting performance, which in turn influences stock returns. Relevance and Vitality may have, in addition to their direct effect, indirect effects as well. In order to assess this potential indirect effect, we estimate a model linking $U\Delta AccP$ to current and lagged values of the change in the brand asset components. Equation 6.2 of Table 6 reports the results of this estimation.

The analysis using accounting performance as the dependent variable shows statistically significant effects for Differentiation, Relevance, Quality, and Familiarity. Quality and Familiarity have significant contemporaneous effects of .012 and .0168, respectively. Differentiation and Relevance have significant lagged effects of .0075 and .0126, respectively. The estimated coefficients for the current and the lagged values of Vitality are both small and insignificant.

Discussion

Our analysis documents that information contained in the Y&R brand asset measures is associated with stock return. We should note that our analysis does not imply causation between changes in the Y&R brand asset measures and stock return. First, the financial markets are not reacting, per se, to Y&R announcements about changes in brand attributes. Rather, the financial markets react to information that the Y&R brand measures also reflect. Second, the association may not be coming from a causal link from changes in brand attributes to stock return, but rather from a joint association with a common factor. For example, new product introductions are likely to drive both stock return and customer perceptions of innovativeness. Chaney, Devinney, and Winer (1991) report the aggregate impact of a new product announcement on stock return to be .75% over a three-day event window. They also find that the more substantial the innovative activity, the greater the stock market response. Bayus, Erickson, and Jacobson

(2003), Pauwels et al. (2004), and Srinivasan et al. (2004) provide further evidence that new product introductions are related to sales, profitability, and stock market valuation. New product introductions also affect customer perceptions of firm innovativeness. As such, the association between brand vitality and stock valuation can be due to the Y&R measure reflecting innovative activities undertaken by the firm that also influence firm valuation. Both considerations highlight that our analysis does not represent a causal linkage. Instead, our analysis documents that the information reflected in the Y&R measures is associated with changes in stock prices.

Brand Asset Index

We find that the Brand Asset Index measure provides incremental information to earnings shocks in explaining stock returns and it has both significant current and lagged association with unanticipated earnings. As such, the measure reflects information about a firm's brand asset composition that affects financial markets' expectations about the firm's future financial performance.

Since the Brand Asset Index measure aggregates components that have differential effects with respect to both stock return and accounting performance, it needs to be treated as an index rather than a scale. Changes in perceived Relevance and Vitality are directly associated with stock returns. Changes in Quality and Familiarity have contemporaneous effects on unanticipated earnings, while changes in Differentiation and Relevance have lagged effects on unanticipated earnings. Aggregation of the components into a single index masks these differential influences.

Differentiation

We find evidence somewhat supportive (although not significant at the 5% level) of a contemporaneous effect of Differentiation on the unanticipated earnings. The lagged effect, however, is both greater in magnitude and statistically significant. This indicates that the effects of changes in perceived Differentiation are not fully reflected within the current period but occur in subsequent periods as well. Interestingly, this result provides evidence of a potential marketplace anomaly. Presumably, the markets should be aware that Differentiation has lagged effects on performance. As such, when Differentiation changes, the market should react in anticipation of future-term impact on performance. Our results, however, do not support this. Differentiation does not have a significant effect in the stock return model. The financial markets do not appear to appreciate the lagged effect of Differentiation on accounting performance, or they do not recognize that a change in Differentiation occurred.

As an additional test, we divided our sample firms into two groups based on whether they had an increase or a decrease in Differentiation. We find that the firms with increases in Differentiation had significantly higher abnormal stock returns in the subsequent period compared to firms with decreases in Differentiation. Firms that increased in Differentiation had a mean risk-adjusted stock return of .048 in the subsequent wave. Conversely, firms that decreased in Differentiation had a risk-adjusted stock return of –.043 in the subsequent wave. These abnormal returns are statistically different from zero and from each other at the 5% level. Whether this difference reflects a financial market inefficiency stemming from the market's failing to appreciate the lagged effects of Differentiation or an inability to recognize in a timely fashion that a change in Differentiation has taken place, or whether it stems from some other source, e.g., unmeasured risk (Fama 1986), remains a topic for future research.

Relevance

Some recent work has sought to highlight the important role played by brand relevance. Aaker (2004), for example, notes, "A brand seems very strong because tracking studies show that it retains a high level of trust, esteem, perceived quality, and perhaps even perceived innovativeness. However, its market share may be slip-

ping. …Why? …The brand has become irrelevant to one or maybe more important segments" (p. 101). Our results suggest that the financial markets are appreciative of the role of brand relevance. We find that Relevance has incremental (to earnings as well as Vitality) information content in explaining stock returns. The financial markets view brands gaining in Relevance as having greater future-profit potential. This is supported by our finding that earnings shocks are influenced by lagged Relevance. Firms gaining in Relevance will be rewarded by greater earnings in the future.

Quality

Quality exhibits the highest bivariate association with stock return of any of the brand asset components. Yet, our analysis shows no direct effect of Quality on stock return. The effect of Quality appears to be fully captured in current-term accounting performance. That is, an indirect effect of Quality exists such that changes in Quality influence contemporaneous accounting shocks, which in turn influence stock return. The financial markets, however, do not attach any incremental influence to Quality: they do not place any additional value on perceived brand quality that does not lead to changes in current-term performance. In other words, if an improvement in quality has not been reflected in improved profits within a year, it is not going to increase profits in the future years.

Aaker and Jacobson (1994) and Mizik and Jacobson (2004), using different data but similar methodology to that employed in our study, find that changes in perceived quality have information content. That is, changes in the quality measure were found to provide incremental information to earnings in explaining stock return. Our results differ from these previous findings in that the Equation 6.1 results show no significant effect of changes in Quality on stock returns. We can only speculate on possible reasons for this difference. It might be that other brand measures included in our analysis better depict incremental brand information than that reflected in Quality. Differences in the quality measure across the studies might also play a role, i.e., the EquiTrend quality measure is based on a 10-point scale, while the Y&R measure is based on the proportion of respondents viewing the brand as high quality. The very strong association between Y&R's quality measure and earnings indicates that the measure does contain a strong signal regarding financial performance. At issue is whether other brand components might tap additional quality perceptions.

Familiarity

We do not find significant direct effects of Familiarity on stock return. Familiarity affects firm value through its influence on earnings. That is, increases in Familiarity are associated with increases in earnings, which in turn influence investor expectations of current and future performance. However, Familiarity has an additional indirect effect associated with Relevance. In a model linking stock return to Familiarity and unanticipated *AccP*, the effect of Familiarity is positive and significant. However, this positive effect of Familiarity diminishes once Relevance is included in the model. This result suggests that increases in Familiarity that do not also induce increases in Relevance are not incrementally valued by the financial markets.

Vitality

Vitality is a brand asset component not emphasized in existing brand equity conceptualizations, but which we hypothesized to be of importance. We view Vitality as tapping the brand's future orientation, and, as such, likely to have value implications for the financial markets. Consistent with this view, we find that our measure of Vitality has a positive and statistically significant direct effect on stock return. Vitality depicts information about performance not reflected in current-term earnings information or in other brand asset components. The Vitality measure includes responses to questions about the brand being dynamic and innovative, which are characteristics likely to be more associated with future capabilities than current-term results.

More research is needed to better understand what else this component taps or reflects. For example, it might be related to a more aggregate "energy" or "buzz" component. In order to assess this possibility, we undertook analysis that included a Y&R BAV survey variable that reflected the proportion of respondents indicating that a brand was "energetic." We find that while Vitality remains statistically significant, the estimated effect of Energetic is small (.002) and statistically insignificant (*t*-statistic = .075). We also assessed whether a buzz construct approximated by the Y&R measure "gaining in popularity" might have an impact on stock return. Here too we find no effect as the coefficient for "gaining in popularity" is both small (–.0007) and statistically insignificant (*t*-statistic = –.16). As such, the financial markets view Vitality as a separate construct from energy or buzz. Many of the activities used to create energy or buzz will have effects that do not impact brand Vitality, which seems to differ primarily in terms of future-term orientation. The effects of Vitality on accounting performance may occur well into the future, which may explain why we fail to observe an association of the earnings shock with either current or one-year lagged Vitality. Interestingly, as part of additional analysis we undertook, we found that both current and lagged Vitality influence unanticipated sales growth. Clearly, more theoretical and empirical research directed at understanding the construct and the value implications of brand Vitality is warranted.

Conclusions

Our study provides evidence of the financial impact of brand assets and demonstrates how customer mindset measures of brand assets can be translated into financial terms. We do so both with an aggregate Brand Asset Index and with specific measures of key brand asset components. Using our performance impact estimates and incorporating relevant costs data, managers can assess, for example, the relative financial benefits of brand enhancement strategies and determine which brand asset components would be more profitable to emphasize. This would help managers better evaluate their resource commitment to marketing budgets and focus their efforts across brand asset components.

A number of different approaches have been advanced for measuring a firm's brand equity. One common method is an "indirect" approach that involves decomposing a firm's earnings into those induced by brand variables as opposed to other factors. Our analysis suggests that this approach will miss key aspects of a brand's value. First, a significant portion of a brand's impact on firm value is not reflected in current-term accounting performance measures. Brand assets affect not only current, but also future, financial performance of a firm. Our analysis suggests that approximately 2/3 of the financial impact of brand assets is not correlated with (and thus cannot be extrapolated from) current earnings information.

Second, we find that brand equity is a multidimensional construct. Individual brand asset components have differential effects on firm financial performance. Analysis based on a decomposition of current product-market outcomes is unable to isolate the sources of a brand's influence. By using customer mindset measures, in conjunction with stock return response modeling, we are able to understand the financial implications of brand asset components more fully. In particular, we are able to identify Vitality as a key missing component in the current conceptualizations of brand asset. We find that Relevance and Vitality have direct effects on stock return incremental to current-term earnings. Quality, Familiarity, and Differentiation impact stock return indirectly through their effects on earnings changes.

We view our study as a first step in investigating the complexity of brand assets and their dynamic impact on firm performance. Many issues require further attention and research. For example, industry-specific differences in brand asset effects may exist and it would be

worthwhile to explore the nature of these differences. How brand assets moderate the effect of marketing activities, such as new product introductions, on financial performance would be another area warranting future study (Srinivasan et al. 2004). As our data sample was dominated by large, well-established firms, the effects of brand assets on market valuation of small firms and for firms as they go through different growth stages are also areas requiring further study. Analysis of the dynamic relationship among brand attributes is yet another useful direction for future research. Use of customer mindset measures allows for study of each of these areas and provides a platform for better understanding the role of brand assets in affecting firm valuation. ■

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Notes

1. Earnings decomposition and extrapolation approaches, which rely on the product-market outcomes to measure brand equity, miss this effect of brand assets. These approaches are based on the premise that the effect of brand assets should be reflected in the marketplace. To the extent that brand assets have effects that are not reflected in the current market outcomes, these valuation approaches will lead to undervaluing brand assets.

2. See Mizik and Jacobson (2004) for a discussion of stock return response modeling in marketing.

3. See Kothari (2001) for a review of this literature.

4. While not receiving the emphasis of the other four brand dimensions, vitality-related brand attributes have received attention in academic research and industry analysis. For example, Keller and Aaker (1998) highlight that a company's reputation for product innovation enhances perceptions of brand extensions. Innovativeness is a component of Fortune's Corporate Reputation measure.

5. We assess the stock market's beliefs regarding the dynamics of Brand Asset by estimating the following model:

$$StkRet_{it} = \beta_1 U \Delta AccP_{iw} + \beta_2^* BrandAsset_{iw} + \beta_2^0 BrandAsset_{iw-1} + \sum_{t=1}^{T} (\gamma_{1w} + \gamma_{2w} * \log MV_{iw-1} + \gamma_{3w} * \log BMV_{iw-1}) * Time_w + \varepsilon_{iw},$$

and testing the validity of the $\beta_2^* = -\beta_2^0$ restriction. We find that we cannot reject the restriction of $\beta_2^* = -\beta_2^0 =$ ($F[1, 918] = .74$), which is consistent with the premise that the stock market is using a random walk to depict Brand Asset dynamics.

6. To obtain estimates of the parameters α_i and ϕ_1, ϕ_2, ϕ_3, and ϕ_4, we use the methodology outlined by Anderson and Hsiao (1982). That is, we take first differences of the data to remove the fixed effect and then obtain an instrumental variable estimate of

$$[(AccP_{iq-1} - \overline{AccP}_{q-1}) - (AccP_{iq-2} - \overline{AccP}_{q-2})]$$ using

$$(AccP_{iq-2} - \overline{AccP}_{q-2})$$ and $$(AccP_{iq-3} - \overline{AccP}_{q-3})$$

as instruments. After obtaining estimates of $\hat{\phi}_1, \hat{\phi}_2, \hat{\phi}_3$, and $\hat{\phi}_4$, we are able to calculate $\hat{\alpha}_i$ as the mean of

$$(AccP_{iq} - \overline{AccP}_{iq}) - \sum^{4} \hat{\phi}_k * (AccP_{iq-k} - \overline{AccP}_{q-k}).$$

This process provides us the coefficient estimates allowing us to calculate the unanticipated component ε_{iq}.

7. Empirically, for the analysis in this study, we find results based on Ordinary Least Squares estimation to be in very close correspondence to those generated based on FGLS estimation.

8. The unequal time intervals do not create any special problems with estimating contemporaneous effects in either unanticipated earnings model (Equation 6) or in the stock return model (Equation 8). The Equation 8 model, for example, can be viewed as a seemingly unrelated equations model by wave with a constraint that the coefficients are constant across the waves.

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