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Linking Customer and Financial Metrics to Shareholder Value: The Leverage Effect in Customer-Based Valuation

Customers are the most important assets of most companies, such that customer equity has been used as a proxy for shareholder value. However, linking customer metrics to shareholder value without considering debt and non-operating assets ignores their effects on relative changes in customer equity and leads to biased estimates. In developing a new theoretical framework for customer-based valuation, grounded in valuation theory, this article links the value of all customers to shareholder value and introduces a new leverage effect that can translate percentage changes in customer equity into shareholder value. The average leverage effect in more than 2000 companies across ten years is 1.55, which indicates that a 10% increase in customer equity is amplified to a 15.5% increase in shareholder value. This research also compares the influence of customer and financial metrics on shareholder value. The findings challenge previous notions about the dominant effect of the retention rate and underline the importance of predicting the number of future acquired customers for a company.

Keywords: customer equity, valuation, shareholder value, customer lifetime value, leverage effect

Customer lifetime value and customer equity (i.e., the sum of all customers' lifetime values) have emerged as key metrics to manage and grow customers—the most important assets of most companies. Thus, academic marketing research has worked to build better models of customer acquisition, retention, and development (e.g., Gupta et al. 2006), which has led to improved marketing decisions and greater marketing accountability (Wiesel, Skiera, and Villanueva 2008). However, to exert greater impact and earn more senior management support, marketing should move beyond tactical decisions and into strategic approaches (Verhoef and Leeflang 2009).

One such approach entails the evaluation of how changes in customer metrics influence not only customer equity but also shareholder value (SHV). Many studies in marketing empirically confirm the value contributions of marketing metrics by correlating them with the stock prices of publicly traded companies (Srinivasan and Hanssens 2009). Customer-based valuation (CBV) instead values companies according to information about their customer base, such as by comparing the value of current and future customers against SHV (Gupta, Lehmann, and Stuart 2004; Libai, Muller, and Peres 2009; Rust, Lemon, and Zeithaml 2004) or regressing measures of customer equity on stock prices (e.g., Kumar and Shah 2009).

Table 1 provides a summary of previous empirical research on CBV. The first four studies all assume that the value of current and future customers (i.e., customer equity) equals the value of the company for its shareholders. They do not account for companies' debt or non-operating business. Thus, they imply that a 10% increase in customer equity yields a 10% increase in SHV. Unfortunately, this implication is wrong in most circumstances. Company debt increases whereas non-operating assets decrease the effect of any percentage changes in customer equity on percentage changes in SHV. From a theoretical perspective, the effect of relative changes in marketing metrics on customer equity cannot be equal to their effect on SHV. Rather, these effects can differ substantially—according to our first empirical study, by a factor of 1.55. Thus, a 10% increase in customer equity leads to an average increase of 15.5% in SHV; marketing managers must be aware of this effect to properly outline the impact of marketing. The last study in Table 1 by Kumar and Shah (2009) acknowledges potential omitted variables in the link between customer equity and SHV but

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TABLE 1
Literature Overview

	Setting				Customer Metrics				Financial Metrics					
Empirical Paper	*Observation Unit*	*Aggregation Level*	*Data Source*	*Time Horizon*	*Margin per Customer*	*Acquisition Cost*	*Customer Churn*	*Churn in Customer Projection*	*Indirect Costs*	*Company-Specific Cost of Capital*	*Taxes*	*Non-Operating Assets*	*Debt*	*Leverage Effect*
Kim, Mahajan, and Srivastava (1995)	One industry, one period	Industry	Public	Infinite	Yes	Yes	No	No	Not explicitly	No	Yes	No	No	No
Rust, Lemon, and Zeithaml (2004)	One company, one period	Customer	Internal	Infinite/ 3 years	Yes	N.A.	Yes	N.A.	Not explicitly	Yes	No	No	No	No
Gupta, Lehmann, and Stuart (2004)	Several companies, one period	Company	Public, expert estimates	Infinite	Yes	Yes	Yes	No	Not explicitly	No	Yes	No	No	No
Libai, Muller, and Peres (2009)	Several companies, one period	Company	Public, expert estimates	Infinite	Yes	Yes	Yes	Yes	Not explicitly	No	Yes	No	No	No
Kumar and Shah (2009)	One company, one period	Customer	Internal	3 years	Yes	Yes	N.A.	N.A.	Not explicitly	No	No	No	No	No
The current study	Several companies, several periods	Company	Public	Infinite	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: N.A. = not applicable.

aims to solve the problem econometrically rather than using company valuation theory (e.g., Copeland, Weston, and Shastri 2004).

Existing research further indicates that customer retention has an overwhelming influence on SHV (e.g., Gupta, Lehmann, and Stuart 2004). To determine the impact of financial and customer metrics on SHV, such research uses what-if analyses to calculate elasticities that reflect the effect of percentage changes in each metric on SHV. Current what-if analyses do not incorporate the likelihood of change for each metric and thus potentially overestimate the effect of metrics that are less likely to change. To address this potential shortcoming, we empirically analyze the likelihood of change for each metric and combine this value with its respective conditional effect. Contrary to prior research, we find that the predicted number of acquired customers is the most important metric for the companies we analyze and that its influence on changes in SHV well exceeds that of customer retention. As such, marketing managers must be more cautious with respect to their focus on retention versus acquisition.

The objective of this article is to establish a link between customer equity and SHV that is based on company valuation theory. To this end, we develop a theoretical CBV framework that incorporates debt and non-operating assets, and we outline the influence of these elements, both theoretically and empirically. In addition, we determine which customer and financial metrics have the strongest impact on changes in SHV. Accordingly, we achieve three novel insights.

First, our new theoretical framework for CBV, which is based on valuation theory, links the value of all customers (i.e., customer equity) to SHV by including non-operating assets and debt, which are currently not considered in the literature (see Table 1). This theoretical framework is flexible enough to encompass various existing customer equity models, not only the one used in the second empirical study of this article. Furthermore, our theoretical framework should encourage the adoption of CBV as a decision-making tool in the financial community because it reflects not only the operating part of a company but also the non-operating part and debt, and it is in line with valuation theory.

Second, we show that including debt and non-operating assets alters the impact of relative changes in customer equity on SHV. Knowledge about the leverage effect is important, particularly to marketers: The leverage effect dictates that relative changes in customer equity do not translate directly into parallel relative changes in SHV. Therefore, it applies in all comparative studies that analyze the influence of customer metrics on SHV across companies, industries, or time. By taking into account the leverage effect, marketing researchers and practitioners can determine precisely the value contribution of marketing actions that attempt to change customer metrics. In turn, marketing managers and chief marketing officers (CMOs) should be better able to encourage the view of marketing as an investment rather than an expense and thus improve its influence within the company (e.g., Boulding et al. 2005; Hanssens, Rust, and Srivastava 2009).

Third, by comparing the influence of various customer and financial metrics on SHV over time and companies, we help identify the metrics that CMOs should monitor most closely and manage most precisely (e.g., Berger et al. 2006). In our study, the predicted number of acquired customers exerts the strongest influence on SHV; it affects SHV more than the customer retention rate or the discount rate, which challenges widely held extant beliefs. Thus, the prediction of future customers merits more attention from researchers and practitioners, especially when they evaluate business cases for marketing investments or attempt to determine companies' SHV (especially with respect to retention vs. acquisition activities).

In the next section, we describe our theoretical framework for linking customer equity to SHV, which also serves as the foundation of our model for CBV. On the basis of this framework, we then define and explain the leverage effect before we analyze its importance in more than 2000 companies over ten years in our first empirical study. In our second empirical study, we then present the results obtained from applying our CBV model to two companies (Netflix and Verizon) over six years and analyze the influence of customer and financial metrics on SHV. We conclude with a summary of our major findings and their implications, as well as an outline of the limitations of our study.

Theoretical Framework for CBV

Our proposed theoretical framework integrates debt and non-operating assets into CBV and is suitable for business valuation in various settings. Its modularized form enables researchers and practitioners to analyze the impact of marketing actions on customer metrics, customer lifetime value, or customer equity, along with their respective impacts on SHV. Furthermore, we describe how to operationalize the theoretical framework as a specific CBV model.

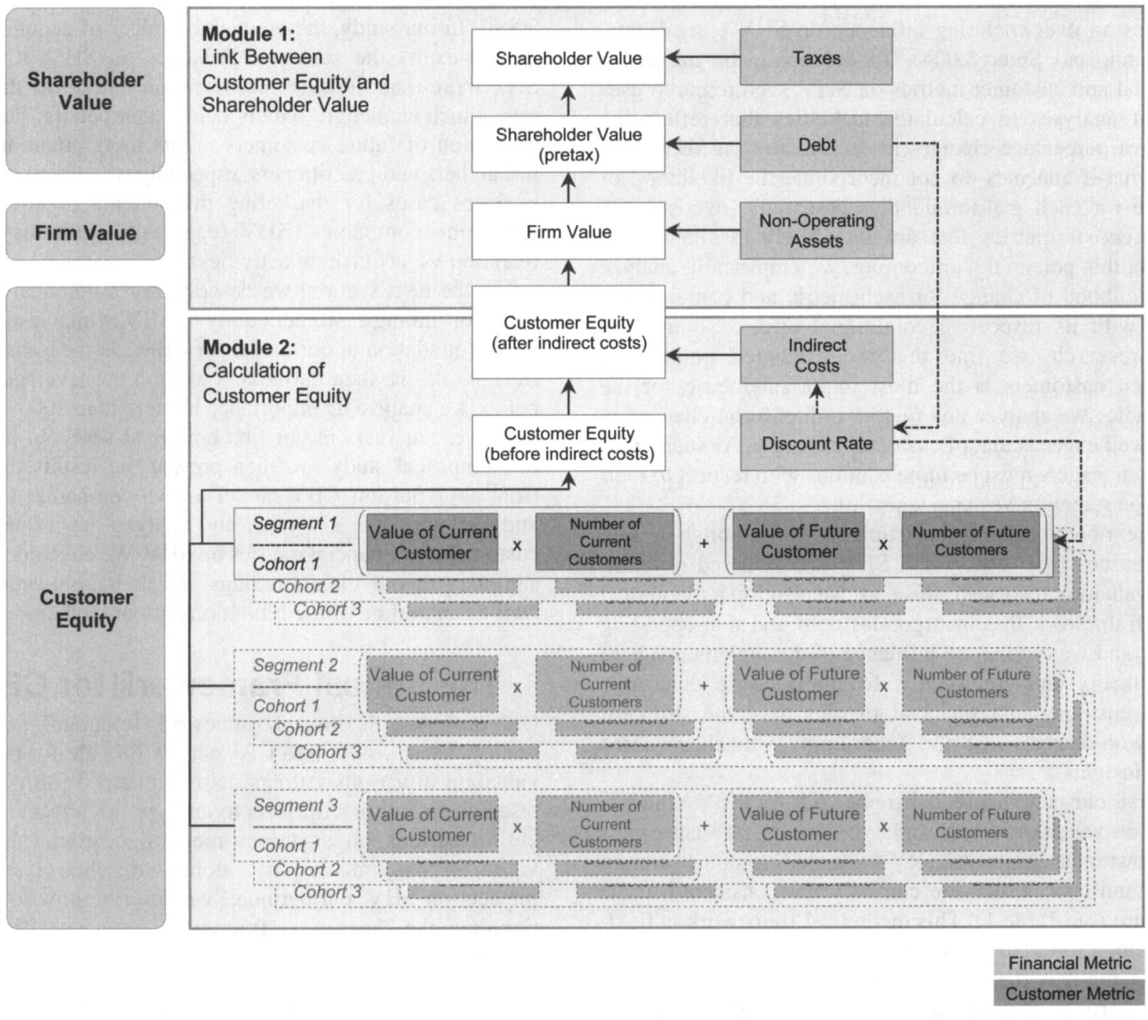
Modules of the Theoretical Framework

Our theoretical framework for CBV consists of two core modules. We depict these modules in Figure 1.

Module 1: Linking customer equity to shareholder value. The first module, entirely new to customer equity research, provides a fundamental link between customer equity and SHV. According to valuation theory, the value of an asset equals the present value of expected cash flows, which represents the profit contribution from that asset. This principle applies to single assets, such as a building, machinery, a brand, or a collection of current and future tangible and intangible assets the company owns. Therefore, the SHV of a company according to Figure 1 is the present value of the expected cash flows that is captured in customer equity, plus non-operating assets and minus debt and taxes.[1] All operational, tangible (e.g., equipment, buildings), and intangible (e.g., brands, knowledge, patents)

[1]Although there might be differences between cash inflows and revenues, as well as between cash outflows and costs, we neglect these differences here for ease of exposition and use both pairs of terms interchangeably.

FIGURE 1
Theoretical Framework for CBV



assets of the company are considered to generate these cash flows and do not have to be valued separately.

To establish a value for the operating part of the company, traditional approaches focus on company-level cash flows, whereas CBV focuses on cash flows at the customer level. The present value of all customer cash flows, and thus the value of all customers (i.e., customer equity after indirect costs, or $CE_{afterIndC}$), reflects the value of the company's operating assets. That is, customer equity (after indirect costs) captures the fundamental value of the company, as in traditional valuation approaches (e.g., discounted cash flow). However, with this customer-centric perspective, we can analyze the impact of changes in customer metrics on SHV.

Companies also own non-operating assets, which are assets they do not need to run the main operations of the business. The value of such assets is not reflected in cash flows from customers. Typical examples that appear on companies' balance sheets include cash and marketable securities, such as bonds (for more details on non-operating assets, see, e.g., Damodaran 2006). Valuation theory clearly states that because these non-operating assets can be sold to others, their value should be added to the operating value of the company, reflected by customer equity after indirect cost ($CE_{afterIndC}$), to determine firm value (e.g., Damodaran 2006; Titman and Martin 2010).

Firm value reflects the value of all claims on the company (i.e., both debt and equity investors own parts of the company). To determine SHV (i.e., the value owned by equity investors), extant theory suggests subtracting outstanding debt and preferred capital (DEBT) from firm value (e.g., Damodaran 2006; Titman and Martin 2010). Debt and preferred capital (sometimes combined under the label non-equity claims) are capital resources not owned by shareholders but borrowed at interest, so they eventually must be repaid.

The company's profits are usually taxed at the combined corporate (federal and state) tax rate, which easily reaches 40% for larger U.S. companies. Taxation and pertinent accounting rules can be complex to model; a detailed

analysis is available in the extensive body of finance and accounting research (e.g., Brealey, Myers, and Allen 2008; Damodaran 2006). However, a reasonably simple approach assumes that companies are fully taxed at the combined corporate tax rate for each company (see Kim, Mahajan, and Srivastava 1995). Then, the SHV should feature the deduction of the resulting value of the tax payments (e.g., Damodaran 2006).

Equation 1 combines these theoretical approaches, such that firm value equals the sum of the operating value of the company ($CE_{afterIndC}$) and non-operating assets (NOA). Firm value less the company's debt (DEBT) and taxes (TAX) then yields SHV:

$$(1) \qquad SHV = CE_{afterIndC} + NOA - DEBT - TAX.$$

Module 2: Calculating customer equity. In the second module, we calculate customer equity, which we define here as the present value of all current and future customers.[2] In its simplest form, customer equity equals the number of current and future customers multiplied by the average (net present) value per current and future customer (e.g., Blattberg and Deighton 1996; Gupta and Zeithaml 2006; Rust and Bhalla 2010; Rust, Lemon, and Zeithaml 2004). Ideally, the value per customer is calculated on an individual level, as is common in models with access to internal, proprietary information (e.g., Kumar and Shah 2009; Reinartz, Thomas, and Kumar 2005). However, in general, valuation models that must rely on less informative or publicly available information require a compromise in the level of detail attained. Potential alternatives to individual customer valuation include grouping customers in period-based cohorts or in segments, such as end consumers versus business clients. This distinction offers greater predictive accuracy than an aggregated analysis (e.g., Gupta and Lehmann 2005; Rust and Bhalla 2010). Moreover, it seems sensible to distinguish between current customers (certain because they have already been acquired) and expected future customers, who entail uncertainty and are more likely to introduce larger errors into the model. The company also usually needs to invest more money to acquire them.

Customer equity is a forward-looking metric; researchers suggest different time frames for the calculation of customer value and projections about future customers. For example, Kumar and Shah's (2009) empirical application projects three years into the future, whereas Kim, Mahajan, and Srivastava (1995), Gupta, Lehmann, and Stuart (2004), and Libai, Muller, and Peres (2009) perform calculations using infinite horizons. Our proposed framework and model accommodate any time frame. Although finite time frames are suitable for tactical marketing decisions (Rust and Bhalla 2010; Schmitt, Skiera, and Van den Bulte 2011), we recognize that valuation models typically use infinite time frames (Holzmann 2010).

[2]Wiesel, Skiera, and Villanueva (2008) and Skiera, Bermes, and Horn (2011) propose customer equity reporting, the aim of which is to provide company stakeholders with information about the value of the current customer base. These contributions define customer equity only as the value of all current customers.

For valuation purposes, customer equity must capture the present value of the revenues and costs of all customers (Gupta, Lehmann, and Stuart 2004). Whereas assigning revenues to customers is relatively straightforward, assigning them costs is more complicated because some indirect costs are not related to the number of new or total customers. By identifying such indirect costs, we can account for decreasing marginal costs and economies of scale. Thus, in our model, customer equity (before indirect costs) ($CE_{beforeIndC}$) measures the present value of the difference between revenues from all customers and all customer-specific costs (i.e., profit contribution per customer), comparable to the customer equity metric commonly employed in previous research (e.g., Libai, Muller, and Peres 2009). However, this measure of customer equity does not account for indirect costs that can reduce shareholder value, so customer equity (after indirect costs) integrates the present value of all indirect (i.e., non-customer-specific) costs, PV(IndC):

$$(2) \qquad CE_{afterIndC} = CE_{beforeIndC} - PV(IndC).$$

In summary, the second module contains the link between customer metrics and customer equity. It distinguishes between cohorts or, more generally, between current and future customers, which then can be sorted further into customer segments. Because it does not prescribe a mechanism for projecting customer numbers or calculating customer value, it can employ data from various companies (e.g., business to consumer or business to business, contractual or noncontractual, young or established, high growth or stable), as long as they observe the necessary customer metrics to calculate customer equity accurately. This requirement should hold for most companies that track customers' behavior over time, such as financial service providers, telecommunication companies, online retailers, and offline retailers that use loyalty cards.

Model Operationalization

The mechanisms in the second module mainly come from previous research (Gupta, Lehmann, and Stuart 2004; Libai, Muller, and Peres 2009). Therefore, we describe how our approach extends and departs from previous studies—namely, in calculating value per customer, predicting the number of future customers, and calculating company- and period-specific costs of capital.

Value per customer. Customer equity (before indirect costs) is the present value of the sum of the customer lifetime values of all current and future customers. Our flexible framework allows for various alternative approaches to calculating customer lifetime value, including lost-for-good formulas with finite horizons, always-a-share approaches, or those suitable for multiproduct environments (Villanueva and Hanssens 2007). In Equation 3, n_t denotes the size of the customer cohort or the number of new customers acquired in period t, and CLV_{ti} denotes the lifetime value of customer i acquired in period t. We distinguish customer equity (before indirect costs) of current and future customers, where $CE_{beforeIndC}^{current}$ equals the sum of customer lifetime values (CLV_{0i}) for all existing customers n_0:

$$(3)\quad CE_{beforeIndC} = CE^{current}_{beforeIndC} + CE^{future}_{beforeIndC} = \sum_{i=1}^{n_0} CLV_{0i} + \sum_{t=1}^{T} \frac{\sum_{i=1}^{n_t} CLV_{ti}}{(1+d)^{t-.5}}.$$

Unlike most customer equity research, our discounting method recognizes that not all customers in a cohort enter at the beginning of period t; instead, they may arrive gradually, such that the average customer comes to the company at approximately the middle of the period, captured by t – .5 (see also Jain and Singh 2002).

Number of future customers. Projections regarding the size of future customer cohorts (n_t) are not trivial. Most diffusion models concentrate on one-time customer adoption; customers can try the product, churn, and discontinue using the product but then potentially begin using it again later (see also Libai, Muller, and Peres 2009). Gupta, Lehmann, and Stuart (2004) use a variation of the original Bass (1969) model, the technological substitution model (also used by Kim, Mahajan, and Srivastava 1995), to project companies' number of future customers. Libai, Muller, and Peres (2009) address the limitation of this model (i.e., it does not capture churn) by modifying the Bass diffusion model to allow lost customers to buy again later. They also include churn from and to competitors and even address the significant negative word-of-mouth effects associated with lost customers. Including these factors requires significant information about competitors, the size of the market, and a clear-cut definition of the industry—information that unfortunately is unavailable in many practical settings.

Inspired by these two approaches, we suggest an alternative for estimating the number of future customers. We build on the technological substitution model but model the number of net total customers, that is, the number of customers after churn. The asymptote α in Equation 4 marks an equilibrium level for total customers: In a given period, all churning customers are replaced with the same number of new customers, resulting in a steady state. The net total customer model is as follows:

$$(4)\quad N_t^{net} = \frac{\alpha}{1+\exp(-\beta-\gamma t)}.$$

The number of new customers acquired in period t equals the difference between the total number of customers at the end of t (N_t) and the beginning of t (N_{t-1}), plus the number of customers lost during the period (assuming newly acquired customers are not lost in the same period):

$$(5)\quad n_t = N_t^{net} - N_{t-1}^{net} + (1-r)\times N_{t-1}^{net}.$$

Thus, the approach in Equations 4 and 5 preserves the desirable features of the technological substitution model with regard to data fit but also accounts for customer churn.

Discount rate. Using industry or even (fixed) market averages as proxies for the company's cost of capital could introduce potentially large errors in CBV models because companies in the same industry often display very dissimilar risk–return profiles (Damodaran 2006). A simple capital asset pricing model approach, for example, can easily capture changes in the discount rate of a company over time, but they would be excluded entirely if stable discount rates were used. Although certainly not undisputed, the capital asset pricing model and weighted average cost of capital approaches are widely recommended to determine the discount rate (Welch 2008). Therefore, we include them with our model but also recognize that other approaches to determining the discount rate are available (e.g., Brealey, Myers, and Allen 2008).

Definition of the Leverage Effect

Our framework includes non-operating assets and debt, with implications far beyond the precise calculation of SHV. That is, marketing managers and CMOs can investigate whether the effect of relative changes in customer equity on SHV increase or decrease because of the company's debt and non-operating assets. A simple and illustrative example in Table 2 demonstrates these implications.

Assume that Companies A–C all have customer equity (more precisely, $CE_{afterIndC}$) of $1,000. Company C has debt of $900, Company B has $1,000 in non-operating assets, and Company A has neither debt nor nonoperating assets. The SHVs of Companies A, B, and C then equal $1,000, $2,000, and $100, respectively, so customer equity would be a good SHV proxy only for Company A but would underestimate the SHV for Company B and overestimate it substantially for Company C. Now, if these companies were to increase their customer equity by 10%, or $100

TABLE 2
Numerical Example to Illustrate the Leverage Effect

	Company A	Company B	Company C
Customer equity (t)	$1,000	$1,000	$1,000
Non-operating assets	$0	$1,000	$0
Debt	$0	$0	$900
SHV (t)	$1,000	$2,000	$100
Relation of customer equity to shareholder value	1:1	1:2	10:1
Customer equity (t + 1)	$1,100	$1,100	$1,100
SHV (t + 1)	$1,100	$2,100	$200
Percentage increase in customer equity	10%	10%	10%
× Leverage effect	1.0	.5	10.0
= Percentage increase in shareholder value	10%	5%	100%

each, the relative effects of those increases on SHV also would differ dramatically, all else being equal: SHV increases by 10% for Company A, 5% for Company B, and 100% for Company C.

We use the concept of elasticities to capture the effect of relative changes in customer equity on relative changes in SHV:

$$(6) \qquad LE = \frac{\partial SHV_{preTax}}{\partial CE_{afterIndC}} \times \frac{CE_{afterIndC}}{SHV_{preTax}} = 1 \times \frac{CE_{afterIndC}}{SHV_{preTax}}$$

$$= \frac{CE_{afterIndC}}{CE_{afterIndC} + NOA - DEBT}$$

$$\wedge SHV_{preTax} > 0, \quad CE_{afterIndC} \geq 0.$$

The effect described in Equation 6 is the leverage effect (LE), or essentially the elasticity of customer equity with respect to SHV. The leverage effect increases with a decrease in non-operating assets (NOA) and an increase in debt (DEBT), which means that even though the absolute increases in customer equity and SHV are the same for all three companies, the relative increases differ. They can be calculated by multiplying the relative changes in customer equity by the leverage effects (last three lines in Table 2). For example, a 10% increase in customer equity with no changes in non-operating assets or debt has a positive impact of LE × 10% on SHV. According to Equation 6, the leverage effect equals 1 only in the unlikely event that non-operating assets equal debt. In all other cases, analyses of the elasticities of customer metrics with regard to SHV must account for the company's debt and non-operating assets separately to ensure that the results are comparable across companies, industries, and time.

Empirical Study 1: Size of the Leverage Effect

Theoretically, the leverage effect can alter the results of CBV substantially, though the size of its effect can be determined only empirically. Therefore, we analyze more than 2000 companies included in Standard & Poor's (S&P) Total Market Index over the ten-year period between 2000 and 2009. This index offers broad market exposure to large-, mid-, small-, and micro-cap companies, including all investable U.S. companies.

The goal of our analysis is to calculate implicit customer equity (after indirect costs) by adding debt to and subtracting non-operating assets from companies' market valuation (Equation 1). To obtain companies' market valuation and financial data for our analysis, we turn to COMPUSTAT. In particular, we use companies' long-term debt and preferred stock capital to operationalize debt, their short-term investments to account for non-operating assets, and the number of common shares outstanding multiplied by their stock prices to calculate SHV. We implicitly include taxes in our calculations because the relative tax rate affects the numerator and denominator of the leverage effect equally. To refrain from making a subjective judgment about the cash needed for the operations, we undertake a conservative assessment of companies' non-operating assets because we do not include any cash or cash equivalents. No detailed information on this topic appears in financial reports or COMPUSTAT.

On average, debt accounts for 23% of firm value, and 4% stems from non-operating assets. For 86% of all companies, debt is higher than non-operating assets. There is considerable variation among companies (e.g., the 75th percentile reports debt accounting for 29% and non-operating assets for 5% of firm value). Consequently, the results demonstrate that companies' debt and non-operating assets determine a substantial part of their value.

We also calculate the leverage effect of customer equity on SHV for each company in each year (Equation 6). The results in Table 3 are aggregated by one-digit standard industrial classification codes and year; they show that the average leverage effect equals 1.55. Despite the notable heterogeneity across years and sectors, the mean values of all years are substantially greater than 1, and we observe values lower than 1 in only 14% (100% – 86%) of all cases. These results indicate that a relative increase in customer equity of 10% leads to an even higher relative increase in SHV in almost all cases, averaging 15.5%.

As a further investigation, we also use the year-end customer equity values from Libai, Muller, and Peres (2009) and combine them with the respective data for debt and non-operating assets. The average leverage effect for the five companies that are not financial institutions equals 1.23—in the same direction as our average of 1.55. Thus, our substantive results indicate that, on average, the leverage effect is greater than 1 and that including debt and non-operating assets creates substantial differences in valuation.

These findings of the factual importance of the leverage effect yield two important implications: First, ignoring the leverage effect can lead to incorrect estimates of the strategic role of marketing in creating value for the company because managers underestimate the (relative) impact of their marketing actions on SHV by an average of 1.55 – 1 = 55%. Thus, the elasticities of customer metrics with regard to SHV will be 55% higher than the corresponding values with regard to customer equity. This stronger effect on SHV has key implications for marketing managers' decisions about their investments in marketing activities as well as their communications with financial markets about the results of their marketing activities. Second, ignoring non-operating assets and debt in CBV models likely causes incorrect SHV estimates. Failing to include the leverage effect leads to a substantial overestimation of SHV by an average of 1 – (1/1.55) = 35%. This severe overestimation has equally severe implications, such as for investors who use CBV to make investment decisions.

Empirical Study 2: CBV

For our second empirical study, we apply our CBV model to analyze two companies. Thus, we aim to determine which customer and financial metrics have the strongest impact on changes in SHV. In addition, we use different time horizons to examine which time frame (between three years and infinity) seems appropriate.

TABLE 3
Leverage Effect for Companies in S&P Total Market Index

Standard Industry Classification	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Mean	Low 5%	High 95%	Leverage Effect Below 1
Agriculture, forestry, and fishing	4.61	1.66	1.63	1.21	1.16	1.30	1.37	1.26	1.38	1.33	1.73	1.08	4.31	3%
Construction	1.80	1.72	2.39	2.06	1.32	1.26	1.33	2.02	3.34	1.95	1.92	1.03	5.69	2%
Manufacturing	1.54	1.40	1.37	1.24	1.17	1.17	1.16	1.19	1.55	1.26	1.31	.83	2.38	26%
Mining	1.48	1.63	1.77	1.46	1.31	1.21	1.30	1.37	2.28	1.75	1.58	1.01	3.30	5%
Nonclassifiable establishments	1.22	1.13	1.39	1.27	1.17	1.09	1.06	1.13	1.39	1.48	1.23	.48	2.00	28%
Retail Trade	1.64	1.36	1.45	1.29	1.28	1.19	1.18	1.33	2.14	1.47	1.43	.94	2.54	17%
Services	1.55	1.36	1.36	1.26	1.22	1.21	1.21	1.30	1.91	1.37	1.37	.83	3.13	33%
Transportation, communications, electric, gas, and sanitary services	1.86	1.86	2.46	1.90	1.79	1.61	1.70	1.66	2.16	2.04	1.91	1.01	3.67	5%
Wholesale trade	1.76	1.67	1.67	1.41	1.33	1.36	1.32	1.29	1.60	1.31	1.46	.97	2.38	10%

The application involves Netflix (NASDAQ: NFLX) and Verizon Communications (NYSE: VZ). Netflix is an online movie rental company with more than 16 million subscribers at the end of 2010. Unlike the rental industry leader Blockbuster, Netflix operates without stores; it mails DVDs and Blu-ray discs to customers. Depending on their subscription plan, customers can keep a certain number of movies for any length of time; when they mail a disc back to Netflix, the company forwards another movie from their "queue" of preferred movies. Verizon Communications is a major U.S. telecommunications company that acquired MCI WorldCom in 2006. It provides landline services in 13 states, though most of its profits come from its 55% stake in Verizon Wireless, the largest cell phone provider in the United States at the end of 2010.

For our empirical analysis, we rely solely on publicly available Securities and Exchange Commission filings for both companies. Our earliest data on Netflix are from the second quarter of 2001, approximately one year before the company's initial public offering in May 2002; this data set extends until the end of 2008. The company has prioritized the publication of extensive financial and customer-related information, including the number of new and lost customers per quarter. This wealth of available information and the persistence of Netflix's business model during our study period (e.g., no corporate acquisitions, same product) facilitate model testing and make it unnecessary to rely on subjective assumptions or outside experts. Our analysis of Verizon begins in 2001 (when the company began reporting more detailed customer data) and runs until the end of 2009. Verizon maintains two rather distinct businesses (wireline and wireless) and acquired several companies during this time frame. Although these factors increase the complexity of the analysis, available published reports are extensive and provide sufficient information to determine the CBV of the company.

Our focus is on comparing the importance of customer and financial metrics in terms of their impact on SHV. We detail the model calibration in the Web Appendix (see www.marketingpower.com/jm_webappendix).

Results of CBVs

The results of our CBV models for Netflix and Verizon confirm findings from previous studies, which indicate that customer metrics provide a good basis for valuation. For Netflix, the model estimates fall between the highest and lowest stock market valuation figures for each of the six years of data we have. As we show in Table 4, by the later years, our valuation tends toward the upper limit of the stock market valuation data, which could indicate either that our valuation is slightly optimistic or that the stock market is slightly conservative and does not yet fully appreciate Netflix's value. The company's stellar development since 2008 provides support for our more optimistic valuation. In contrast, our CBV results for Verizon tend to be less optimistic than the stock market data. They fall within the stock market interval for three of six years, but we calculate a slightly lower SHV for the remaining three years (Table 5).

We benchmark our results against the actual high/low market capitalization for both companies. Although in general, companies' market capitalization is regarded as a good estimate of their SHV (e.g., Malkiel 2003), we acknowledge that even the stock market might not provide a "true" valuation, due to irrational behavior or poorly informed investors (e.g., Shiller 2005). Thus, our benchmark serves to check face validity, and we acknowledge that stock

TABLE 4
Overview of Metrics and Results for Netflix

	2003	2004	2005	2006	2007	2008
Customer Metrics						
Customer profit contribution	81.55	85.01	68.28	69.74	67.07	55.01
Retention rate	41.0%	42.5%	49.1%	53.0%	51.9%	52.9%
Acquisition cost	34.13	38.71	40.12	44.27	41.87	29.94
Number of current customers	1416	2486	4026	6154	7326	9164
Financial Metrics						
Discount rate	11.4%	15.3%	13.4%	14.4%	14.9%	10.5%
Indirect cost	4.6	4.2	4.1	5.1	4.5	4.5
Non-operating assets	59.3	82.0	106.2	165.5	181.2	151.8
Debt	63.3	95.5	138.4	194.6	216.3	270.8
Results						
Customer equity (before indirect costs, current)	115	211	327	557	617	683
Customer equity (before indirect costs, future)	921	1,422	1,991	2,967	1,825	2,858
Customer equity (after indirect costs)	996	1,606	2,288	3,489	2,412	3,498
Taxes	397	637	902	1,384	951	1,352
Shareholder value	595	955	1,353	2,076	1,426	2,028
Market						
Market capitalization minimum	275	488	488	1,243	1,014	1,054
Market capitalization maximum	1,515	2,097	1,656	2,272	1,892	2,407

Notes: Annual values. All numbers except customer metrics and discount rate are in millions of U.S. dollars.

TABLE 5
Overview of Metrics and Results for Verizon

	2004	2005	2006	2007	2008	2009
Customer Metrics						
Customer profit contribution	112.49	106.87	150.81	145.17	138.68	123.51
Retention rate	78.7%	81.8%	83.2%	82.2%	81.8%	79.3%
Acquisition cost	219.06	240.74	316.85	238.00	198.97	166.07
Number of current customers	43,816	51,337	59,052	65,707	72,056	91,249
Financial Metrics						
Discount rate	5.7%	4.7%	5.2%	6.4%	3.5%	3.5%
Indirect cost	8,260	8,206	11,901	11,584	11,334	11,025
Non-operating assets	34,730	23,693	25,484	15,169	25,155	19,296
Debt	35,674	31,569	28,646	28,203	46,959	55,051
Results						
Customer equity (before indirect costs, current wireless)	9,072	11,989	20,651	20,606	23,695	23,480
Customer equity (before indirect costs, future wireless)	76,269	124,403	152,281	138,167	196,698	188,970
Customer equity (before indirect costs, wireline)	353,763	378,703	433,626	367,667	337,310	262,716
Customer equity (after indirect costs)	59,595	136,318	111,373	127,404	151,252	125,461
Taxes	12,199	26,716	22,508	23,789	26,925	18,659
Shareholder value	46,452	101,726	85,703	90,581	102,523	71,047
Market						
Market capitalization minimum	96,588	82,438	85,013	100,748	65,288	73,863
Market capitalization maximum	119,624	116,200	110,229	130,859	125,426	98,371

Notes: Annual values. All numbers except customer metrics and discount rate are in millions of U.S. dollars. Customer metrics refer to wireless.

prices do not necessarily reflect the intrinsic, fundamental value of a company at all times.

Comparison with Valuation Model Based on Customer Equity

The inclusion of debt and non-operating assets in CBV models is mandated by valuation theory (e.g., Damodaran 2006; Titman and Martin 2010). To compare our CBV model with previous approaches that do not consider debt and non-operating assets (Gupta, Lehmann, and Stuart 2004; Libai, Muller, and Peres 2009), we use year-end data for the five nonfinancial companies in Libai, Muller, and Peres (2009) and the 12 distinct valuations of Netflix and Verizon in our study. We benchmark customer equity (after tax) and SHV (including debt and non-operating assets) against the range of the stock market valuations for the company in the same year and find that our model performs better in two cases (Table 6). Specifically, adding and subtracting non-operating assets and debt to customer equity (after tax) moves our result for SHV into the observed range of actual stock market valuations. In the other cases, no improvement is evident. In none of the cases does the consideration of non-operating assets and debt lead to inferior results. Overall, the results offer empirical support for including non-operating assets and debt in CBV models.

Comparison of Results for Different Projection Horizons

The CBV results depend heavily on the time horizon of the projections. Previous research (e.g., Kumar and Shah 2009) has proposed limiting consideration of future developments to three years to acknowledge, among other things, the typical investment cycles for stock owners, the uncertainty of long-term predictions, and the impending risk of obsolete business models, especially in rapidly changing industries. In general, models using finite time horizons in CBV are more conservative because the company has less time to earn profits. At the same time, highly indebted companies likely display negative SHV with shorter time horizons because the accumulated profits may not be sufficient for them to pay off their debts.

For our calculations, we consider infinite time horizons, following Kim, Mahajan, and Srivastava (1995), Gupta, Lehmann, and Stuart (2004), and Libai, Muller, and Peres (2009). Under this approach, we can mitigate the increasing uncertainty and risk of developments beyond the immediate future through discounting: Risky business environments should have high discount rates that impose a large weight on developments in the near future. In contrast, in stable business environments with lower costs of capital, companies' mid- and long-term development becomes relatively more important.

Both three-year and infinite projections can work in certain settings, but our analyses of Netflix and Verizon offer little support for the use of finite time frames in CBV models. As we show in Figure 2, only ten-year and infinite time frames produce valuation results that fall within the stock market valuation range for Netflix in the same year. Three-year projections, on average, are 57% below the stock market valuation minimum for the corresponding year. Figure 3

TABLE 6
Comparison of Market Capitalization Estimates from Valuation Models Based on Customer Equity and Shareholder Value

Source of Customer Equity Estimates	Company	Date of Valuation	Customer Equity (After Tax)	Shareholder Value	Market Cap (Min)	Market Cap (Max)	Superior Estimate of Market Cap (CE/SHV/None)
Libai, Muller, and Peres (2009)	Amazon.com	December 31, 2004	5,308	3,935	15,293	25,848	None
	Mobistar	December 31, 2004	4,825	4,629	2,547	4,138	None
	Sirius Satellite Radio	December 31, 2006	6,818	5,791	4,965	9,215	None
	SK Telecom	December 31, 2004	19,577	16,347	12,559	18,177	SHV
	XM Satellite Radio	December 31, 2006	4,472	3,186	2,945	9,315	None
The current study	Netflix	December 31, 2003	599	595	275	1,515	None
	Netflix	December 31, 2004	969	955	488	2,097	None
	Netflix	December 31, 2005	1,386	1,353	488	1,656	None
	Netflix	December 31, 2006	2,105	2,076	1,243	2,272	None
	Netflix	December 31, 2007	1,461	1,426	1,014	1,892	None
	Netflix	December 31, 2008	2,146	2,028	1,054	2,407	None
	Verizon	December 31, 2004	47,396	46,452	88,013	125,397	None
	Verizon	December 31, 2005	109,602	101,726	96,588	119,624	None
	Verizon	December 31, 2006	88,865	85,703	82,438	116,200	None
	Verizon	December 31, 2007	103,615	90,581	85,013	110,229	None
	Verizon	December 31, 2008	124,327	102,523	100,748	130,859	None
	Verizon	December 31, 2009	106,802	71,047	65,288	125,426	SHV

Notes: CE = customer equity, SHV = shareholder value; all values are in millions of U.S. dollars; Mobistar is in millions of euros. Estimation of a model is considered good if the estimated market capitalization (market cap) is between the respective minimum and maximum value. A superior estimate occurred if the other estimate was outside this range.

FIGURE 2
Netflix Valuation with Projection Horizons Between Three Years and Infinity

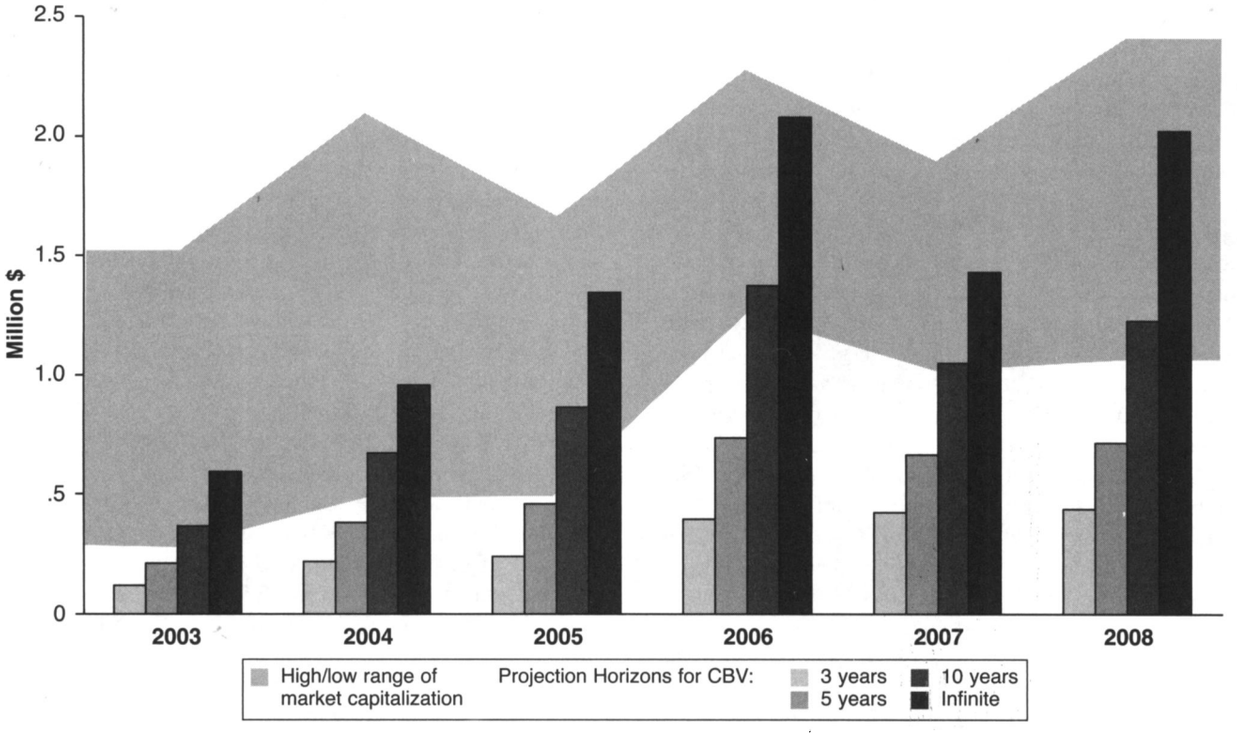
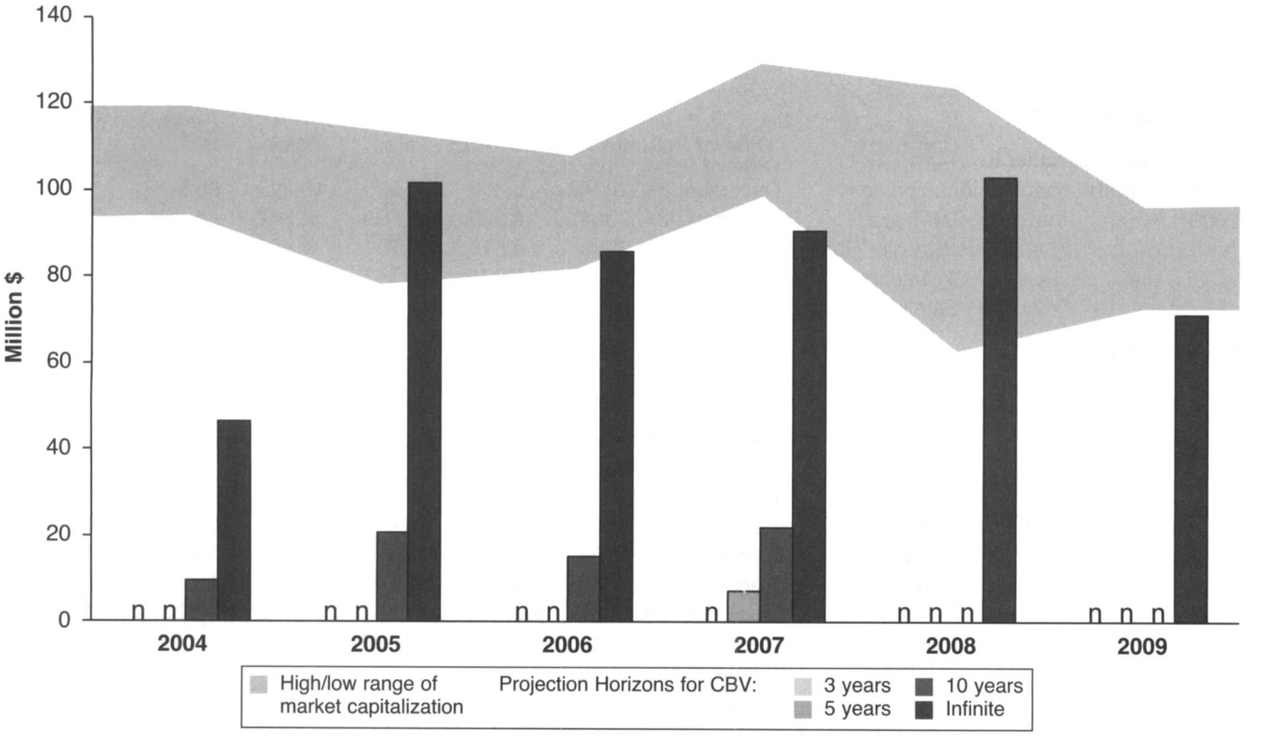


FIGURE 3
Verizon Valuation with Projection Horizons Between Three Years and Infinity



depicts the corresponding results for Verizon. Compared with Netflix, Verizon has a much higher debt-to-market-value ratio, so it takes Verizon longer to accumulate sufficient profits to repay its debt, leading to largely negative values for SHV (denoted as n in Figure 3) for shorter projection horizons. Our findings clearly support the use of infinite projection horizons in the CBV models for Netflix and Verizon. However, our analysis of projection horizons is limited to these two companies and should not be taken as more than an indication for other companies or industries.

Drivers of Shareholder Value

Knowing which metrics in our CBV model are most pertinent to SHV is of paramount importance in an empirical setting. For managers and investors, this knowledge indicates the most important drivers of SHV; for modelers, it offers an indication of potential sources of prediction errors. In general, observed changes in SHV reflect the combination of two effects: the impact of changes in metrics on SHV and the likelihood of observed changes in metrics over time.[3] The former effect is frequently measured by elasticities and can result from a what-if analysis. The latter can be captured by the magnitude of change over time. Because we apply the same model for Netflix and Verizon over several years, we can observe the interplay of the two effects: elasticity and magnitude of change.

The (unreported) elasticities of customer and financial metrics for Netflix are in line with those that Gupta, Lehmann, and Stuart (2004) provide. The elasticity of customer retention is the largest by far (M = 4.4), followed by customer profit contribution (M = 1.8) and discount rate (M = 1.1). In a simple what-if analysis, a 1% increase in customer retention leads to an SHV increase of 4.4%. Yet the results for the combined effects—elasticity × observed magnitude of change—are quite different. For example, the elasticity of Netflix's retention rate in 2003 equals 3.4, whereas the elasticity for the number of future customers in 2003 is only .9. The unexpected observed change[4] in customer retention, however, is relatively small in 2003 (8.1%) and even smaller in subsequent years. The combination of a rather high elasticity with a moderate magnitude of change leads to a total effect of $3.4 \times 8.1\% = 27\%$; that is, the SHV of Netflix in 2003 would have been 27% higher if customer retention in 2003 had matched the expectations at the end of 2002. In contrast, the relatively low elasticity for the number of future customers combined with a high magnitude of change (61.4% lower than expected) leads to a much stronger total effect ($.9 \times -61.4\% = -57\%$) on the number of customers: The SHV of Netflix in 2003 would have been

[3]Note that we do not include the cost of potential changes in the parameters in our analysis; a marketing manager with access to additional data likely could do so (e.g., Kumar and Shah 2009; Reinartz, Thomas, and Kumar 2005).

[4]Note that we use unexpected changes because investors' expectations about company developments are already included in the SHV estimates.

57% lower had the number of future customers in 2003 been as expected at the end of 2002.

In Table 7, we consider the combined effect of elasticity and magnitude for customer retention and all other metrics for Netflix. The results may come as a surprise to readers of previous research: Despite its high elasticity, the retention rate has a smaller effect on changes in SHV because its likelihood to change (as measured by the magnitude of change over time) is rather low. Instead, two relatively large decreases in profit contributions (both due to price wars with competitors) dominate SHV changes in 2005 and 2008; for all other years, the number of customers has the largest absolute average effect. We acknowledge that Netflix's company profile is rather unique; during the observed time frame, the company had enjoyed annual growth rates in its number of customers of 25% or more, regardless of its age. As Gupta and Zeithaml (2006) suggest, this strong growth rate may contribute to the relatively low impact of customer retention.

The results for Verizon in Table 8 indicate a similar pattern, though the acquisition of MCI WorldCom in 2006 created large (unexpected) changes in its profit contribution and indirect cost. The averages for five years, excluding 2006, mirror our Netflix results: Future customers, customer profit contribution, and the discount rate drive SHV.

The implications of this longitudinal analysis are at least threefold. First, customer metrics are important drivers of SHV that cannot be ignored when valuing companies (Amir and Lev 1996). Second, as might be expected from finance literature (e.g., Jensen and Johnson 1995), the discount rate and its fluctuation in different market environments significantly influence SHV and cannot be assumed to be stable. Third, despite its high elasticity, retention rate is not the main driver of changes in SHV over time in our applications; instead, the number of customers, which deviates strongly from the previous year's predictions, plays this role. However, our analysis of the drivers of SHV is limited to two companies and should not be taken as anything more.

Leverage Effect for Netflix and Verizon

For Verizon—a company with considerable debt and relatively small non-operating assets (Table 5)—the leverage effect in 2009 is 1.40. As a result, a 10% increase in customer equity (after indirect costs) would translate into increases in SHV of 14%, which is good news for the marketing manager whose marketing actions will achieve greater impact and create more SHV. Ignoring debt and non-operating assets in the CBV model would yield a SHV result that is 29% too high, and such inaccuracy could have far-reaching consequences for both analysts and investors. For Netflix, however, both debt and non-operating assets are relatively small (Table 4), so the 2008 leverage effect is only 1.04. This value will only slightly increase the market-

TABLE 7
Effect of Changes in Customer and Financial Metrics on Netflix's Shareholder Value

Changes in	2003	2004	2005	2006	2007	2008	Absolute Average
Customer Metrics							
Profit contribution	25%	–7%	46%	–4%	7%	35%	21%
Retention rate	27%	3%	12%	7%	–1%	2%	9%
Acquisition cost	–2%	9%	3%	8%	–4%	–23%	8%
Number of customers	–57%	–50%	–35%	–31%	45%	–9%	38%
Financial Metrics							
Discount rate	38%	38%	–13%	8%	4%	–30%	22%
Indirect cost	0%	0%	0%	0%	0%	0%	0%
Non-operating assets	–2%	–1%	–1%	–1%	0%	1%	1%
Debt	2%	1%	1%	1%	0%	1%	1%

TABLE 8
Effect of Changes in Customer and Financial Metrics on Verizon's Shareholder Value

Changes in	2004	2005	2006[a]	2007	2008	2009	Absolute Average	Absolute Average Without 2006
Customer Metrics								
Profit contribution	48%	–22%	–211%	–23%	13%	62%	63%	34%
Retention rate	–33%	–18%	–10%	4%	2%	14%	13%	14%
Acquisition cost	25%	10%	32%	–28%	–15%	–22%	22%	20%
Number of customers	–25%	–12%	44%	20%	124%	–8%	39%	38%
Financial Metrics								
Discount rate	32%	–26%	19%	40%	–76%	–2%	32%	35%
Indirect cost	10%	–2%	142%	–10%	–10%	–20%	32%	10%
Non-operating assets	–5%	13%	–3%	5%	0%	7%	6%	6%
Debt	–6%	–3%	–3%	0%	14%	9%	6%	7%

[a]2006 results largely driven by acquisition of MCI WorldCom.

ing manager's impact, but it still translates into a potential valuation error of $119 million for investors. Overall, the results point in the same direction as our findings about the leverage effect for more than 2000 companies in the S&P Total Market Index, as well as the outcome for the five companies mentioned previously from Libai, Muller, and Peres's (2009) study.

Summary, Implications, and Limitations

Summary

Customers are the most important assets of most companies, so using customer equity as a proxy for SHV is very appealing. Yet this equivalence is true only in the unlikely event that non-operating assets equal debt. Otherwise, neglecting debt and non-operating assets leads to biased estimates of SHV. Rather than a 10% increase in customer equity leading to a 10% increase in SHV, the increase will be greater for companies with high debt and lower for those with substantial non-operating assets. In our empirical study of more than 2000 companies over ten years, the average leverage effect is 1.55: We find that 10% changes in customer equity lead, on average, to 15.5% increases in SHV. Furthermore, for 86% of these companies, a 10% increase leads to a percentage increase in SHV greater than 10%. Thus, our results have significant implications for managers as well as researchers.

Managerial Implications

Marketing managers must plan resource allocations for individual marketing activities. Our results help them by showing that the effect of relative changes in customer equity on SHV increases or decreases according to the company's debt and non-operating assets. Managers should incorporate this leverage effect into their determinations of the value contributions of marketing actions that attempt to change customer metrics. We recommend calculating a company-specific leverage effect, though the average leverage effect of 1.55 provides managers with a quick rule of thumb to begin. The high share of companies (86%) with a leverage effect greater than 1 makes it reasonable to assume that a percentage increase in customer equity leads to a higher percentage increase in SHV.

A longer time horizon also seems more appropriate for calculating customer lifetime value or customer equity and determining the effect of marketing activities on these metrics. Although it introduces additional difficulties in terms of estimation, marketing managers should capture longer-term effects in their planning to avoid underestimating the effect of marketing activities. Our results reveal that the number of customers is the main driver of changes in SHV—a finding contrary to previous research that has emphasized the need to pay special attention to customer acquisition strategies and the prediction of future number of customers when making decisions about marketing investments.

Chief marketing officers can use our results to highlight marketing's value contribution and increase accountability. The leverage effect might lead companies to become even more customer-centric; on average, the payoff from customer management activities is 55% greater than originally expected. Our results also indicate that CMOs should consider the long-term impact of their actions because only long horizons properly reflect SHV in both our applications. The results also detail the influence of various customer and financial metrics on SHV over time and across companies. Such knowledge is important because it reveals which metrics CMOs should monitor and manage with the most care.

Finally, our results have implications for the financial community. Companies might be motivated to disclose more marketing metrics in their financial communications, which are designed to help assess the amounts, timing, and uncertainty of prospective cash receipts (Wiesel, Skiera, and Villanueva 2008). Yet few companies currently report detailed customer information, such as customer margins or the number of new, lost, and total customers. Materiality, which defines the threshold between important and trivial information, requires companies to disclose proprietary information they otherwise would not disclose voluntarily (e.g., Heitzman, Wasley, and Zimmerman 2010). For companies whose values are driven largely by customers, information about their management of customers and customer metrics are material. Thus, we advise such companies to disclose their customer metrics, to ensure their adherence to existing legal requirements and reduce information asymmetry.

By the same token, we recommend that investors and analysts should make better use of customer metrics and add CBV approaches to traditional methods to assess the value of the company. The CBV approach might be especially relevant for customer-centric companies and situations in which traditional approaches are known to be weak, such as high-growth markets with high customer acquisition costs, companies with negative profits that require forecasting "hockey stick" developments, and companies whose short-term financial metrics cannot reliably capture the true value of long-term customer relationships (Damodaran 2006). If investors use the CBV approach to improve their estimates of SHV and make better informed decisions, it could affect and improve the valuation of companies in the stock market as well.

Research Implications

Our results have several implications for research. The proposed theoretical framework is flexible enough to capture various existing customer equity models, not just those noted in this article. Its modularized form can assist researchers who analyze the impact of marketing actions on customer metrics, customer lifetime value, or customer equity by enabling analyses of the respective impacts on SHV. The newly proposed leverage effect makes doing so relatively easy.

Our findings clearly support the use of infinite projection horizons in CBV models. While our analysis of projection horizons is limited to only two companies, the support for longer projection horizons offers a good recommendation for other research projects that consider customer lifetime value and customer equity.

Finally, researchers should account for a company's debt and non-operating assets when analyzing the relative

value contribution of marketing actions. For example, a percentage increase in customer equity by acquiring additional customers leads to an even higher percentage increase if debt is high and to a lower percentage increase if non-operating assets are high. Thus, the financial structure leverages the impact of percentage changes in customer equity on SHV. Although the implications beyond CBV are not the focus of this article, the impact of the leverage effect extends far beyond CBV models. For example, brand equity models that connect the value of the brand to SHV should consider debt and non-operating assets because they affect the percentage changes in brand equity on SHV in a similar way as the percentage changes in customer equity. Event studies, for example, also relate marketing actions (e.g., new product introductions or announcements) to relative changes in SHV. Marketing actions in such studies typically seem to have no or little impact on non-operating assets and debt. All else being equal, other than the capital structure, such actions should lead to stronger percentage changes in SHV for companies with more debt but lower percentage changes for firms with substantial non-operating assets. The leverage effect could better capture such differences across companies or time.

Limitations and Further Research

Several limitations of this study suggest opportunities for additional research. In particular, data availability limitations prevented us from considering the cost of changes in customer metrics, which would be especially worthwhile for capturing customer retention. Therefore, we do not propose any implications for optimal resource allocation, which is beyond the scope of our analysis, though other studies focusing on marketing resource allocation rather than valuation have addressed this topic. Furthermore, we develop our framework for a broad range of companies, but we study only two companies in depth. Additional research should evaluate other companies and industries to confirm the robustness of our findings, particularly our surprising results regarding the importance of customer acquisition relative to customer retention. Moreover, our results stress the importance of good prediction mechanisms, especially for numbers of new customers. More research regarding these prediction mechanisms could increase the prediction accuracy of CBV models. Finally, there might be an indirect link between customer equity and SHV through debt; more research is needed to investigate the effect of marketing on companies' debt levels.

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