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Linking Customer Assets to Financial Performance

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As more firms adopt a customer asset management approach to their business, it has become increasingly important to understand how customer management efforts relate to the financial performance of the firm. Of specific interest to shareholders is the relationship between traditional financial measures and customer-centric measures. The customer-centric measure that has received the most attention is customer lifetime value (CLV). In this article, the authors argue that the basic CLV model represents a useful foundation from which to begin to fill the gap between marketing actions and shareholder value. However, much work remains to be done before appropriate models can be developed that reflect the true value of a customer to the firm. Specifically, this article elaborates on how factors such as risk associated with customer behavior dynamics, social and competitive effects, and the effect of the product life cycle can be incorporated into the basic CLV model.

Marketing assets in general, and customer assets in particular, have taken on increased prominence in marketing in recent years. This focus on customer assets has been driven, in part, by the recent crash of the dot.com marketplace. Although the term *asset* connotes something of financial value, most of the dot.com start-ups were funded based on customer-centric measures such as eyeballs, number of customers, and click-through's, which have an indirect and often tenuous relationship to shareholder value. In fact, some have focused on these customer-based metrics as one of the chief culprits behind the crash be-

cause they provided an erroneous assessment of the firm's ability to leverage its customer relationships to generate sustainable, positive cash flows. If there is one lesson to be learned from the dot.com crash, it is that firms need more effective ways to understand the linkage between customer assets and shareholder value. The importance of being able to understand and assess the value of customer assets is highlighted by the fact that as much as 80% of the value of a firm is composed of intangible assets.

The purpose of this article is to explore ways of linking customer assets to financial performance more effectively. We center our discussion on the Customer Lifetime Value (CLV) model that is widely used to assess the value of customer assets (Berger and Nasr 1999; Dwyer 1997). Usage of the basic model has led to critical insights into marketing management such as the importance of retention to firm profitability. However, the basic model is relatively simplistic and fails to suitably account for factors such as the risks associated with customer behavior dynamics, social and competitive effects, and the effect of the product life cycle. If the customer asset management approach to marketing is to become more than just a slogan, then it is essential that research be conducted into these important topics.

A basic premise of this article is that customer asset value is correlated with the firm's financial performance and is reflected in traditional financial metrics that are used to evaluate the firm. To link the customer asset to financial performance, it is necessary to understand the measurement of customer lifetime value and its indicators. Thus, the article is organized as follows. We start with a discussion on the basic model for measuring the value of the customer asset. We then examine how the model can be extended to more accurately reflect the customer's contribution to shareholder value. Our main objective in this article is not to formally derive mathematical formulas but to show which measures or indicators should be useful for valuing the customer base.

MEASURING THE VALUE OF THE CUSTOMER ASSET: THE BASIC MODEL

Before attempting to link customer assets to financial performance, it is crucial to define what those assets are and how to measure them. The notion that a firm's relationship with a customer can be viewed as an asset is grounded in both the resource-based view of the firm (Barney 1991; Hunt and Morgan 1995) and the relationship-marketing paradigm (Dwyer 1997; Morgan and Hunt 1994). From a financial perspective, the metaphor of customers as firm assets is consistent with a capital budgeting model in which managers attempt to value projects using asset pricing models such as the Capital Asset Pricing Model (CAPM) (Brealy and Myers 2000). What marketers have proposed is that instead of valuing a "marketing project" involving expenditures for the acquisition and retention of customers, it is more useful to change the unit of analysis from the project to the customer. Under a customer asset management (CAM) perspective, customers are viewed as risky assets that may produce cash flow for the firm over time. The value of the customer asset is then the expected risk-adjusted profits they produce over time including the acquisition, retention, expansion, and deletion costs (Blattberg, Getz, and Thomas 2001).

Of course, forecasting the cash flow from even current customers is nontrivial and subject to potential bias. Similarly, adjusting for the risk associated with consumer behavior dynamics is a substantial issue for current customers and is even more difficult for valuing potential customers that have yet to be acquired. To facilitate a discussion of these difficult issues, we have differentiated the various ways in which the firm can derive value from current and potential customers in Figure 1. As Figure 1 illustrates, customers can create value for the firm in a variety of ways. The most obvious is from current customers continuing to buy the same thing from a company (Cell 1). The present value of these cash flows (CLV), which obviously depends heavily on the retention rate, is easy to analyze. In its simplest form, by assuming a constant defection rate d, a discount rate k, and a constant net margin (profits–retention costs) of m, the value of the annuity attributable to customer i reduces to

$$CLV_i = m_{1i} / (k_1 + d) \tag{1}$$

It is evident from equation 1 that the firm has two main opportunities for leveraging a current customer to create value via its core product offerings. The first is through reducing the defection rate, d. Management of this factor has received considerable attention from marketing scholars in recent years since Reichheld and Sasser (1990) first demonstrated the financial benefits of retention. The second opportunity stems from the ability to increase the net margins through up-selling and increasing the frequency of usage of the product (Bolton and Lemon 1999).

We can incorporate the value of the up-selling opportunity into the base equation by adding a term for individual i's growth rate, g_i. This growth rate can be used to value cross-selling opportunities to an existing customer. To the extent a constant growth rate g_i is a reasonable assumption in the near term (obviously untenable in the long run) and g_i is less than $(k + d)$, customer value is approximated by

$$CLV_i = m_{2i} / (k_2 + d - g_i) \tag{2}$$

FIGURE 1
Sources of Value Derived From Customers

Product	Current Customers	New Customers
Current category	Cell 1 • Up-sell • Upgrade • Increased usage	Cell 2 Ongoing acquisition activities
Related category	Cell 3 Cross-selling away from core product offering	Cell 4 Cross-selling back to core product offering
Unrelated Category	Cell 5 Brand extensions	Cell 6 Diversification

Notice here we allow for k_2 (i.e., discount rate related to growth in customer profitability or margin) to be greater than k_1 to reflect greater uncertainty. Similarly, m_2i reflects additional costs to expand the relationship as well as additional revenue.

A similar calculation applies to new (not yet acquired) customers. However, in this case (Cell 2), one needs to subtract the acquisition cost for individual i, a_i because it is typically a significant expenditure that has not yet been accounted for in a new customer value analysis:

$$NCLV_i = [m_i / (k + d - g_i)] - a_i \qquad (3)$$

The outcomes associated with the other cells in Figure 1 become increasingly uncertain for the firm. For example, Cell 5 assumes that the firm can leverage existing customer relationships to encourage customers to buy additional items that are unrelated to their core product purchase (i.e., brand expansion). Cells 2 and 4 represent even greater levels of uncertainty. These cells represent increased volume and cross-selling to as yet to be acquired customers, suggesting at least for the initial year (i.e., when a cohort becomes a customer for the first time) that a higher discount rate is required. Finally, Cell 6 essentially represents diversification (e.g., Coca Cola expanding into hotels) and is clearly the most uncertain. In fact, it is not clear that even if a company can do this, its success would be due to its customer value, and hence use of this cell in assessing customer value is questionable at best. Interestingly, using an approach that focuses on Cells 1-4, Gupta, Lehmann, and Stuart (2001) were able to value several Internet firms and in doing so confirmed their previously overvalued status.

Valuing Cross-Selling Opportunities

The valuation of cross-selling opportunities is a function of both the likelihood (i.e., probability) of cross-selling and level of success (sales or profits) of cross-selling to both existing and potential customers. It is important to acknowledge that the firm's customer and product management strategies affect both the likelihood and level of cross-selling. Specifically, the decision of what product to offer as a cross-buying opportunity is a part of the product management strategy, and how to tailor the offering to each customer is a part of the customer management process. Merging these two strategies in a way that optimizes the expected value of the cross-selling opportunity is not a trivial process.

Naturally, prediction and valuation tasks are far more complicated, although not impossible, for potential as opposed to existing customers. The level or magnitude of cross-selling success is obviously a key determinant in customer valuation. However, because the valuation computation is based on anticipated future activities, it is also important to address the cross-selling *probability*. The likelihood of successful cross-selling (i.e., the cross-selling rate or probability) is an important issue because it reflects the "potential" value of a customer as opposed to only the value that is currently known. A conservative definition of potential value of a customer to a firm is the profitability of a customer across all products or services in a certain market of the firm (Grant and Schlesinger 1995; Verhoef and Donkers 2001). One should clarify this definition by noting that the future purchase behavior of a customer drives the magnitude of a customer's potential value. For example, undergraduate students have a low *current* value in the financial service market. However, to the extent that they are likely to have a well-paid job in the future, they probably have a high *potential* value.

Accounting for future customer dynamics, particularly those that represent changes in margin contribution or changes in the degree of a customer's loyalty, are critical to linking customer assets to shareholder value. In essence, the potential for cross-selling represents the opportunity for growth in cash flows and, equally important, the *sustainability* of that growth. From a share holder's perspective, firm growth and sustainability of that growth are key to the value of his or her investment. Addressing the issues of sustainability and growth of customer assets, Blattberg, Getz, and Thomas (2001) introduced the concept of a customer equity flow statement. This is a summary statement that reflects current and expected future changes in the firm's customer assets. Forecasts of the expected future value of the customer asset are achieved by

focusing on changes in margins and retention rates of newly acquired customers and existing customers. In addition, the flow statement also accounts for lost customer value from defected customers. From a shareholder's perspective, this type of summary is useful because it helps him or her to quantify and monitor one aspect of the firm's intangible assets.

The value of the customer equity flow statement is highly dependent on accurate forecasts. Thus, applying the appropriate forecasting models is essential. With an increasing interest in customer relationship management, direct marketing, and data mining, models that predict response to a direct mailing (Bult and Wansbeek 1995) are estimated on the basis of purchase histories. This information can be aggregated across time and customers to estimate the future value of market segments. The choice of model form depends on the purpose. In the context of predicting customer behavior and implementing one-to-one marketing and cross-selling strategies, managers typically use recency, frequency, and monetary value (RFM) information (Hoekstra and Huizingh 1999).

When linking cross-selling opportunities to firm financial performance, aggregate forecasts are suitable. These forecasts are typically based on longitudinal analysis of a customer database. In this analysis, aggregated cross-selling probabilities for each offered service could be computed. It is essential to account for these differences as contribution margins and retention rates may differ between the offered services. In some contexts, these differences might be quite huge.

Consider a financial service provider. For this company, cross-selling a mortgage to customers is much more profitable in the long run than cross-selling car insurance, for which competition is rather severe, resulting in low prices and high defection rates. Also, when accounting for cross-selling probabilities in firm valuation, one should be aware of the fact that ideally, these probabilities should be product and customer specific. For example, Kamakura, Ramaswami, and Srivastava (1991) show that the likelihood of cross-selling success is asymmetric in financial markets and that the likelihood of cross-selling credit cards to mortgage holders is higher than the reverse. They capture these asymmetries via latent trait analysis.

A focus on high *potential* value customers is essential to enhance the value of a firm. Regardless of their current value, if firms are only able to attract and keep customers with low potential value, growth opportunities will be limited. Clearly this should be a "red flag" to long-term investors and market analyst. For example, in their analysis for direct insurance writers (e.g., Progressive or GEICO), Verhoef and Donkers (2001) showed that direct marketers of insurance capture only a small part of a relatively large group of customers with high potential value. Although this suggests that the company has growth opportunities, it also suggests that the sustainability of this growth may be more difficult.

This example raises the important issue of the relationship between the type of customer one attracts and his or her value to the firm. Thomas (2001) pointed out that attraction and customer retention are not independent processes. Reinartz and Thomas (2001) extended this analysis by exploring the direct and indirect relationship between the customer attraction method and the lifetime value of a customer. It is important to note that some customers can signal their level of potential value from their deal proneness. Customers seeking the best deal usually have better price information (Lichtenstein, Ridgway, and Netemeyer 1993). Verhoef, Franses, and Hoekstra (2001) showed that customers with better price information are less willing to cross-buy. If a company is able to attract only price-conscious customers, these customers will have a lower expected potential value because they will be the first to switch to competitors offering better deals. Thus, the type of customers one attracts has a critical impact on the growth of the firm and the sustainability of that growth.

One last element that is perhaps the most difficult to grasp is the cross-selling ability of the company. In this context, cross-selling ability refers to the infrastructure and systems that the firm has in place that facilitate cross-selling efforts. For example, loyalty programs affect cross-buying (Verhoef 2001). Relative to the implementation of a cross-selling effort, loyalty programs provide the firm with a customer base that can be easily and efficiently identified and targeted. Loyalty programs also facilitate the development of a close relationship with the customer that can be characterized by a mutual commitment by both parties to continue the relationship. Verhoef (2001) showed that affective commitment is an important driver of cross-buying.

The firm's ability to leverage outsourcing opportunities can also greatly influence its cross-selling ability. Companies such as USAA and more recently America Online (AOL) exploit opportunities to expand their product offerings through partnerships and outsourcing arrangements. These arrangements minimize the costs and risks associated with cross-selling while expanding the firm's share of the customer's wallet.

Finally, we note that when analyzing cross-selling opportunities of firms, one should not solely take the revenues into account. It is also important to consider the investments needed to cross-sell successfully. For example, Bolton, Lemon, and Verhoef (2001) showed that the costs of a loyalty program often are greater than the addi-

tional revenues from cross-buying caused by this program. Thus, although a firm might have high cross-selling ability and high probabilities of success, the costs of being successful might be so high that it affects customer value negatively.

Valuing Brand Extension Opportunities

Although the vast literature (e.g., Aaker and Keller 1991) on brand extensions demonstrates their success in terms of reduced costs and time and higher rates of success of introducing new products, there are important limitations. For example, there is concern that a high degree of consistency between the currently offered branded products and the extensions is needed to avoid dilution. Furthermore, Verhoef, Franses, and Hoekstra (2001) noted that in professional services industries with low consistency between offered services, one might expect few spillover effects of brand associations and satisfaction of the currently consumed services to the new services. From a financial analysis perspective, the valuation of brand extension opportunities is fraught with uncertainty. This uncertainty can be better managed if one understands the relationship between the brand and the customer franchise. One could argue that the value of the brand and its ability to be extended depend in part on the quality of the customer franchise where quality is reflected in both the current and potential value of that franchise. In terms of our model as described in equations (2) and (3), this means that brand extensions in markets with customers who have high potential value will have larger values of g_i than markets where the customer's potential future value is lower.

When valuing brand extensions, it is critical to assess how the magnitude of the growth factor in the customer valuation model differs across individuals. From a sociological perspective, one could assert that customers (people) exist as part of a complex social system involving other customers, potential customers, and competitors. Within this system, influence is overtly or inadvertently exerted by all members and to all members. This suggests that the value of the customer asset should be determined, in part, by the nature of the individual's position and influence in the social system and that these social connections should be reflected in the customer valuation model. Some business models rely heavily on the role and interaction between influencers and buyers. For example, in the health care industry, specialists who are likely to be influencers on other specialists or general practitioners are targeted and courted in order to gain their support for a product. The specialist is then used as a marketing tool by the firm to garnish support from other potential buyers. Thus, the realized and potential value of the influencer is far greater

than the direct cash flows that it generates. This can be clearly seen when one considers that some influencers in the health care industry are administrators or other health care workers (e.g., pharmacists and nurses) who do not directly generate any cash flows to the firm. In terms of the CLV model, this means that the magnitude of g_i for an influencer has a latent component that represents the referral and/or endorsement value of a customer. Thus, the growth potential of an influencer is greater than just the margins generated from a greater depth and breadth of buying.

Moving From CLV to Customer Equity

Up to this point, we have discussed the basic CLV model, which is an individual-level model. Another basic measure that is often referenced when discussing the financial performance of a firm is *customer equity* (CE). The CLV model and the CE model are directly related. In fact, CE is just the aggregation of the expected lifetime values of a firm's entire base of existing customers and the expected future value of newly acquired customers. As shown in equation 4, CE is the sum of equations 2 and 3 for all existing and new customers.

$$CE = \sum_{j=\text{all new customers}} NCLV_j + \sum_{i=\text{all existing customers}} CLV_i \qquad (4)$$

A basic premise of a customer asset management is that firms should seek to optimize their CE. Unfortunately, in a resource-constrained environment, optimizing CE involves balancing trade-offs between investments in existing customers and investments in new customers (Blattberg, Getz, and Thomas 2001). These trade-offs are reflected in the magnitude of the margin and expenditure terms of equations 2 and 3. Specifically, in the model for existing customers (Model 2), the margin is highly dependent on retention costs. In the new customer model, the margin from purchases as well as the acquisition investment, a_i, have a significant influence on the customer value.

Because all firms lose customers for one reason or another, it is critical that they carefully manage the balance between acquisition and relationship maintenance investments. Investments made in the customers influence both their current and future behavior. The impact of investments on future behavior make CE management challenging and necessarily a dynamic process, particularly as the composition of the firm's customer database evolves.

While CE is the aggregate measure that reflects the overall or total value of a firm's customer assets, when developing customer management strategies and tactics, it is helpful to discuss the value of individual customers and

the factors that influence that value. Thus, the remainder of our discussion focuses on the individual-level model.

EXTENDING THE BASIC CLV MODEL

Customer asset valuation models are still in their infancy. Thus, it is not surprising that the basic model contains numerous deficiencies that limit its effective application to a wide variety of markets. In this section, we attempt to identify some of these deficiencies and, where possible, to explore possible solutions.

Adjusting for Risk of Individual Customers

An unresolved challenge for marketers is how to adjust for the differential risk of various customers. Surely, money invested in a longtime customer with a steady purchase history is less at risk than money invested in a prospect with little knowledge about the firm. Yet the customer profitability model discussed in the previous section, which is widely used by businesses in a variety of markets, assumes that all customers are equally risky and discounts their revenue streams at the same discount rate. As Figure 1 illustrates and as was suggested by the prior discussion, clearly the level of uncertainty about the outcomes of a firm's marketing efforts increases as the firm focuses its efforts on new customers and new product categories. By relying on a single discount rate (usually the weighted average cost of capital), the firm is undervaluing its longtime customers and overvaluing its prospects. This is not a serious concern as long as the customer profitability model is used as a general strategic tool to guide retention efforts and the like. However, an increasing number of firms are using these profitability models to allocate scarce marketing dollars (Brady 2000), and the current model could induce them to underspend on current customers and overspend on acquisition efforts.

The basic model is problematic in its treatment of risk in another regard. As we have previously noted, the basic CLV model is a derivative of the CAPM that adjusts for risk through the risk-adjusted rate of return (RAR) in the denominator. But what are the sources of risk that might affect the value of a customer asset? Cash flows derived from a customer are at risk due to a variety of factors such as defection, reduced share of wallet, reduced size of wallet, and increased cost to serve. The risk factor that has been of greatest concern to marketers has been defection. Indeed, the probability of defection is explicitly included in the model by adjusting the expected cash flows by the retention rate. These risk-adjusted cash flows should be discounted at a lower discount rate, yet this is not typically done. As a result, the basic model may systematically overdiscount expected cash flows and undervalue the customer asset.

From a financial perspective, this problem stems from mixing two distinct, yet equivalent, asset valuation models. The first model is the RAR that we have discussed previously. The RAR model estimates the actual cash flows expected from the asset and then accounts for *all* sources of risk through the discount rate. The alternative approach, called the certainty-equivalent approach (CEQ), explicitly adjusts the magnitude of expected cash flows for various risk factors and then discounts them at the risk-free rate to account for the firm's opportunity cost of capital. The two approaches, when properly applied, yield the same value (Brealy and Myers 2000). The problem with the basic CLV model is that it mixes these two approaches by using a RAR (such as the weighted average cost of capital) and then adjusting the future cash flows for the risk of defection.

There are a number of possible solutions to this problem. The most obvious would be to rely on a single valuation methodology. Marketers are most comfortable with using a RAR, and most would undoubtedly prefer its use going forward. However, an essential part of using a RAR is to adjust the rate to reflect the true risk of the particular customer segment that is being valued. This task could be accomplished by measuring the variance of returns over time for various segments and calculating the appropriate discount rate (Copeland and Antikarov 2001). Perhaps a more interesting possibility would be to pursue the CEQ approach to its logical conclusion by attempting to partial out *all* of the risk factors, not just the probability of defection. Thus, the basic model might also include terms for decreased share and size of wallet. The appeal of this approach is that it would provide managers with additional metrics linked directly to customer profitability that could be affected through marketing strategies, albeit with increased complexity.

Capturing Social Effects

Implicit in the basic customer valuation model is the notion that a customer's contribution to the firm can be valued in isolation and that those values can then be summed to form an estimate of the firm's CE (Blattberg and Deighton 1996). Although valuing a tangible asset such as a machine in isolation may be appropriate, the assumption is more problematic when applied to customers. Customers exist as part of a complex social network including other customers, potential customers, and customers of competitors' firms. The way in which these customers interact can have a substantial impact on their contribution to the firm's profitability. Word-of-mouth (WOM) commu-

nications have long been recognized as an important factor influencing a consumer's choice of products (Arndt 1967; Brown and Reingen 1987; Westbrook and Fornell 1979). Indeed, marketers generally acknowledge that customers who spread positive WOM are worth more than those who do not or who spread negative WOM. However, the basic model fails to account for the contribution of social interactions such as WOM to firm profitability. As a result, it can lead to substantial errors in estimating customer profitability.

There are a number of avenues by which social processes such as WOM can contribute to the value of the customer asset. Previously, we mentioned how social effects can affect brand or product adoption and therefore influence the growth factor. Another means is through reducing the acquisition costs of the firm. When a firm acquires a satisfied customer who spreads positive WOM, it also acquires any customers whom the customer might convince to purchase in the future. The value of these additional acquisitions can be substantial. For example, a recent study involving hairstyling customers found that, on average, they spread between 2.85 and 3.88 WOM incidents after each hairstyling appointment, depending on the type of establishment. When the value of this WOM was incorporated into a CLV model, the value of WOM ranged from 97% of the base value of a customer to 214%, depending on the type of salon (Hogan, Lemon, and Libai 2001a). Thus, the value of a customer asset can increase substantially when the customer is valued in the context of the social system in which he or she resides.

Clearly, marketers miss a substantial amount of the value of a customer by treating the customer as an isolated entity. In addition to decreasing acquisition costs, social processes among customers may help increase retention rates as current customers share their experiences with one another, as in so-called brand communities. Thus, the return derived from a firm's investments in service quality may be substantially higher than predicted by established methods such as the return on quliaty (ROQ) approach (Rust, Zahorik, and Keiningham 1995).

Incorporating Competitive Effects

Essentially, most CLV models assume constant contribution margins, constant defection rates, and growth rates over time (Berger and Nasr 1999). This implicitly assumes no impact of competition and other external events. The exclusion of these effects might have dramatic effects on the valuation of customers. Rust, Lemon, and Zeithaml (2000) propose one of the few models accounting for competitive effects. They show how actions of the focal firm such as quality improvements affect customer equity.

Their model also provides the opportunity to compute the impact of competitive actions on customer equity of the focal firm, as does the Customer Asset Management in Service Industries (CUSAMS) model proposed by Bolton, Lemon, and Verhoef (2001). The latter model shows how a firm that exceeds customer satisfaction levels of its competitors can increase customer value. Such computations can be used to assess the sensitivity of CE to the actions of competitors. For example, one can show how the Markov switching matrix changes when competitors change their customer relationship management (CRM) strategy (Rust, Lemon, and Zeithaml 2000). If this switching matrix is heavily affected by actions of competitors, it might imply highly volatile retention rates. The degree of volatility can be further assessed by considering estimates of the likelihood of competitive reactions. This can either be objective using analytic models (Leeflang and Wittink 1996) or with subjective approaches. The firm's ability to track competitive actions and react properly to these actions may also come into play when valuing the customer (Narver and Slater 1990).

In addition, external environment variables, such as the economic environment, can have a dramatic impact on the valuation of customers. For example, during recessions, customers become more price sensitive. This leads to pressure on prices and more switching. Customers are also more prone to buy cheaper brands. This is particularly revealed in the increasing share of private labels during recessions (Hoch and Banerji 1993). Current CLV models do not consider these external events. The same methodology proposed for the inclusion of competitive effects can be used. Based on historic figures or the manager's experience, one could estimate the sensitivity of the different components for these external events. Subsequently, using publicly available figures on, for example, the expected growth of the economy, one could estimate the likelihood of occurrence of these events. Of course, we still are unable to account for unexpected shocks.

Developing a Truly Individual Customer Profitability Model

Few advances in marketing during the past several years have been heralded more than the advent of CRM, which promises to enable firms to adapt strategy decisions to the individual level by leveraging the vast amount of customer information gathered through a dizzying array of touch points. However, there is reason to question whether the promise of value-based individual marketing can be fulfilled using extant models. Perhaps one of the most critical shortcomings of the basic model is that it assesses only the value of an "average customer" by using customer cohorts to forecast future sales and to estimate retention

rates. The distinction between an average and individual model is important because, thanks to interactive technologies, the firm possesses substantial information about an individual customer's attitudes, purchase behavior, and shopping habits. Yet, how can this information be incorporated into a customer profitability model that only has inputs for "average" customers?

Clearly, there is a need for a valuation model fitted for individual customers (probably using Bayesian methods) that can be updated as the firm learns more about the customer's purchasing habits and lifestyle. A concept in CRM that attempts to make summary or average measurements more useful and representative of the entire databases is the idea of duration-adjusted measures (Blattberg, Getz, and Thomas 2001). The basic premise behind a duration-adjusted measure is that customers behave differently at different stages of the customer lifecycle. For example, a newly acquired customer who is still in the trial and learning stages of his relationship with the firm may be more likely to defect than an existing or core customer who has had extensive experience with the firm. Another factor that supports the use of duration-adjusted measures is that it is not uncommon that a firm's customer database will have a disproportionate number of existing customers versus newer customers. Moreover, the ratio of new to existing customers will change as the firm's acquisition and retention strategy changes. A typical summary measure (i.e., a non-duration-adjusted measure) simply averages the value of a single measure (e.g., retention rate) over several periods. This average becomes the average metric typifying behavior for the entire database of customers. In contrast, when computing duration-adjusted summary statistics, firms acknowledge that newly acquired customers may have dramatically different "averages" than core customers and that the customer portfolio does not have equal numbers of each customer type. Thus, a duration-adjusted weighted average will be more reflective of the dynamics in the firm's acquisition and retention strategies.

Although more complex than applying duration adjustments to measures, there is also a rich literature in finance on stochastic valuation models that could provide a foundation for future research (see Trigeorgis 1999 or Merton 2000 for a thorough discussion). These models have been applied to a variety of assets ranging from machinery to large-scale projects and could potentially be adapted to customer assets. The models assume a stochastic process for how the value of an asset evolves over time and then updates the value of the particular asset based on information gained through experience with the particular asset.

Marketers could develop stochastic models for various customer segments and, upon acquisition, value the customer according to the information known at the time. As the firm learned more about the customer, his value to the firm would be updated in one of two ways. First, the customer's value could be adjusted based on actual purchase behavior. Thus, if a customer purchased more than expected, the value could be adjusted based on the underlying stochastic process. Second, if the firm learns that the customer had been placed in the wrong stochastic process upon acquisition, it can switch the customer to a more appropriate process. For example, suppose the firm acquires a customer whom it believes to be a single woman between the ages of 18 and 34 and assesses her value based on a stochastic model describing similar customers. However, when the firm learns through an online survey that the customer is actually married with two children, it can switch the valuation model to one that reflects the purchases of that segment. Thus, using this approach, the firm can incorporate both purchase and demographic information to assess the value of its customers.

ADAPTING CLV ACROSS THE PRODUCT LIFE CYCLE

Another implicit assumption of the basic CLV model is that the expected value of an acquired customer is independent of the stage of the product lifecycle. This assumption runs counter to conventional wisdom that recognizes that early adopters affect the rate at which future customers adopt a product (Rogers 1995). Innovators acquired in the introductory stage of a new product market may be worth more than customers acquired in later stages. A recent study incorporated a diffusion model into the CLV framework to quantify this value differential for the online banking market. The results of the study indicate that the total value of a customer (including social effects) for an online banking customer ranges from approximately $850 for an innovator to $575 for an early adopter, to just more than $200 for a laggard (Hogan, Lemon, and Libai 2001b).

Other aspects of the basic model could be adapted to account for stage of the product life cycle as well. For example, entering a market during the growth stage may require higher acquisition costs as firms must spend additional dollars to educate consumers about the product category as well as the brand. Given the uncertainty of customer demand and competitive effects in the early stages of the market, a higher discount rate should be applied to customers acquired in the introductory and growth stages of the market. Traditionally, marketers have been relatively unconcerned about risk-adjusted discount rates, preferring to leave those adjustments to the financial staff. Yet, if customer valuation models are to inform resource allocation decisions, it is essential that marketing managers leverage their knowledge of the customer to provide the best possible risk adjustments. This need not be a burdensome task:

A number of commercially available Monte Carlo simulation software packages can be used in conjunction with established decision-making techniques to estimate the volatility of future customer cash flows (Hogan 2001). These volatility estimates can then be a basis for estimating the appropriate discount rate for customers at various stages of the life cycle (see Copeland and Antikarov 2001 for a description of such a methodology).

Accounting for Managerial Flexibility

Another limitation of the basic CLV model is that it implicitly assumes that the firm adopts a fixed strategy for managing the customer asset. This assumption stems from the use of a net present value (NPV)-based approach to valuation that requires the firm to forecast future revenues, costs, and investments and discount them based on the cost of capital and the specific risk of the investment (Brealy and Myers 2000; Day and Fahey 1988; Rappaport 1986). Critics of the NPV approach contend that it provides an inaccurate estimate of value in many circumstances because of its underlying assumption that the timing and magnitude of future investments are fixed at the time of valuation (Amram and Kulatilaka 1999; Copeland and Antikarov 2001; Dixit and Pindyck 1994; Luehrman 1998a, 1998b; Trigeorgis 1999). Although this assumption might be suitable for certain investments in capital equipment where the investment occurs at the time of purchase, it may not be appropriate for customer assets for which the firm makes ongoing investments in retention and cross-selling depending on customer information gained during the relationship life. When investments in an asset are staged over time, managers have an opportunity to learn from previous investment outcomes and use that knowledge to make more effective decisions going forward. This ability to learn from experience before making investments can be quite valuable to the firm, yet the value of that learning is not captured in the traditional CLV metric. Consequently, the basic CLV metric can substantially *undervalue* customer assets because it does not recognize that managers have flexibility in determining the timing and magnitude of future investments in retention, cross-selling, and even abandonment.

These potential future investments have similar characteristics to financial options in which the firm has the right, but not the obligation, to invest in the asset. Incorporating managerial flexibility to either invest in or divest an asset is the central theme of the emerging literature on real options. Real-options analysis captures the value of flexibility that firms have when making relationship-related investments (Amram and Kulatilaka 1999; Dixit and Pindyck 1994; Trigeorgis 1999). A recent study has ex-

panded the basic CLV model to also include the value of the firm's options for future growth through cross-selling and up-selling, as well as the option to abandon the relationship or switch to a more profitable relationship at some future time (Hogan and Hibbard 2001). Whereas real options-based approaches to valuation have had a substantial effect on strategy development in other functional areas, they have garnered only modest interest in marketing (Slater, Reddy, and Zwerlein 1998). Options-based models represent a rich venue for research in the realm of customer asset management.

BEYOND CLV: EXPLORING THE DIRECT LINK BETWEEN CUSTOMER ASSETS AND FINANCIAL PERFORMANCE

For publicly traded companies, the ultimate goal is to explain and manipulate market capitalization or shareholder value (Srivastava, Shervani, and Fahey 1998). Linking marketing actions through customer value to changes in market metrics (e.g., market value added, or MVA) represents one way that this goal can be achieved (Figure 2). In doing so, an important distinction exists between *change/flow* measures and *state* measures. Whereas measures such as economic value added (EVA) and MVA focus on changes in financial performance, others such as market capitalization measure the level of performance. Still other metrics such as ROX (RO = return on; X might be advertising or investment or assets or sales) provide diagnostics that are useful in assessing the impact of managerial actions and a "snapshot" view of performance. The reverse arrows in Figure 2 suggest that there is value in working backward in linking metrics that financial markets track (such as price/earnings (P/E) and market-to-book (M/B) ratios to customer value and then to marketing actions that create customer value (product development, advertising, etc.). Measures of stock market performance (last column, Figure 2) that might be linked to measures of customer value (Figure 1) include the following:

- *Market capitalization.* Market capitalization has been linked to the value of intellectual property such as marketing expertise and customers (Lev and Sougiannis 1996).
- *Difference between market capitalization and book value.* Market capitalization is the market value of all outstanding shares of a firm. Book value is the difference between a firm's assets and liabilities. The difference between market and book value is assumed to be due to intangible and hard-to-measure assets such as brand equity, intellectual property, process knowledge, and human capital. The magnitude of this difference is driven in part by a firm's

CE. The growth and dynamics in this difference should mirror the dynamics in CE.

- *Market-to-book (M/B) ratio.* This is the ratio of market capitalization to the book (or accounting value) of a firm. The relationship between brand value and M/B is demonstrated by Kerin and Sethuraman (1998). Using this linkage to brands, one could extent it to customers and customer potential value. (This is similar to Tobin's Q.)

- *Tobin's Q.* Tobins Q is the ratio of the market value of the firm to the replacement cost of its tangible assets, including property, equipment, inventory, cash, and investments in stock and bonds (Tobin 1969). A q value greater than 1 indicates that the firm has intangible assets. These assets enable a firm to create earnings in excess of the return on its tangible assets and to achieve an abnormal return on invested capital relative to its competitors (Klock and Megna 2000). The linkage to customer assets is that the larger the CE, the larger the q value should be. An interesting analysis would be to compute the firm's CE. Add the CE total to the value for the replacement costs of the firm's tangible assets. Then compute the q value using the customer equity added into the denominator of the ratio. If the firm's valuation is highly dependent on its customer assets, then the revised ratio should move closer to 1.

- *EVA and MVA.* According to some, EVA is the financial performance measure that comes closer than any other measure to capturing the true economic profit of an enterprise. Simply put, EVA is the net operating profit minus the cost of capital employed to produce those profits for that year. EVA is frequently used, but the empirical link between increasing EVA as a result of investments in marketing assets has to be proven. EVA has been very popular in corporate financial management and is available through Stern Stewart, a leading proponent of EVA analysis. The critical linkage to explore is the percentage of EVA created by customer assets. For example, it might be possible to show that superior customer value leads to higher margins either due to higher prices (from end consumers) or lower distribution costs (due to clout over distributors or "customers"). An interesting application is in Ailawadi, Borin, and Farris (1995). MVA tracks the change in market cap. The utility of demonstrating the impact of marketing actions on EVA and/or MVA through customer value is that it provides a direct link between marketing strategy and changes in a firm's financial fortunes.

- *Margins, Earnings, and Cash Flow.* The stock market pays a great deal of attention to the ability of firms to maintain or increase margins. Lowering of prices and therefore margins is often viewed as evidence of vulnerability to competitive inroads. For example, reduction in Marlboro prices by Philip Morris in the early 1990s was interpreted as the "death of brand equity" and had a ripple effect on the price of stocks across the consumer packaged goods industry. Clearly, earnings depend both on market share and net margins. However, the market often focuses more on margins because market share metrics tend to be more stable quarter to quarter. Because of accounting vagaries, earnings can often be manipulated. This has led to a focus on cash flow (earnings adjusted for interest, depreciation, and investments).

- *P/E and price/cash flow (P/CF) ratios.* These compare market caps ("price" of stocks) to earnings and cash flow, respectively. Generally, firms with higher growth prospects and lower risk (both volatility and vulnerability of cash flows). Marketing and customer management has obvious impact on these factors. In fact, brand loyalty (or customer retention) is especially important in determining financial value. Unfortunately, marketers tend to focus more on revenue and market share and less on the long-term impact of retention in demonstrating the value they create (Srivastava, Shervani, and Fahey 1998).

- *ROX and CFROI (cash flow returns on investments).* These are important diagnostic metrics and are often used to compare projects and track success temporally. Once again, the role of marketing actions and customer value, although implicit (e.g., that customer satisfaction ultimately leads to greater returns or profits), needs to be made explicit by showing the direct impact on share and margins.

In linking customer value to financial performance (or back to its marketing activity antecedents), the first stage is to establish correlations (i.e., that they are related). For example, Lane and Jacobson (1995) showed that brand extension announcements lead to abnormal returns on stocks (i.e., returns in excess of those predicted by changes in the market index), thus establishing a link between marketing activity and stock price. Srivastava et al. (1997) showed that brand equity is related to a lower cost of capital and therefore higher market capitalization. The ultimate goal, however, is to demonstrate how changes in customer and brand value lead to changes in financial market value (Kerin and Sheturaman 1998). One example that demonstrated this relationship using a customer profitability model is the work of Gupta, Lehmann, and Stuart (2001) that compared the value of the customer base to the market capitalization for several Internet firms. Demers and Lev (2000) have shown that site characteristics measured by Nielsen/Netratings, such as stickiness, reach, and loyalty, were correlated with share prices both in 1999 and 2000. Anderson, Fornell, and Lehmann (1994) reported positive associations between satisfaction and firm profitability as return on investment.

InterBrand demonstrates a strong correlation between brand reputation and financial performance (Woods

FIGURE 2
Marketing, Customer Value,
and Financial Performance

←	←	←
Marketing Actions	*Customer Value*	*Financial Value/Market Cap*
Advertising	(see Figure 1)	Market capitalization ("Cap")
Promotion		Market-to-book ratio
Price		Tobin's Q
Distribution		Economic value added
Product development		Market value added
Service		Earnings and cash flow, margins
		Price/earnings and price/ cash flow ratios
		Percentage of total assets attributed to current assets
		ROX (X = assets, investments, invested capital, etc.)
		Sales, sales/assets (= turnover)
		Cost of capital
		Marketing costs

1995). But the alternative explanation of reverse causation has yet to be ruled out. Finally, Kim, Mahajan, and Srivastava (1995) showed a strong relation between the net present value of cash flows attributable to customers and stock prices in the cellular telephone industry. Such findings, if replicated in other industries, will demonstrate that shareholder value is indeed linked inextricably to customer value. As a consequence, research on new measurement models linking stocks (customer assets) and flows (changes in customer assets) to changes in financial performance measures are particularly fruitful. On the positive side, it is worth noting that although other assets depreciate, customers and brands are those only assets that appreciate!

CONCLUSION

As the opening article to this special issue points out, emerging forces in the marketing environment are driving fundamental changes in the way that the firm understands and manages its relationship with its customers. While global competition is forcing firms to improve the efficiency of their marketing programs, the explosion of customer information is providing raw material with which to work. What has been lacking to date are the models capable of making the link between a firm's actions designed to shape the customer relationship and the long-term profitability of the firm.

In this article, we have argued that the basic customer lifetime value model represents a useful foundation from which to begin to fill the gap between marketing actions and shareholder value. However, much work remains to be done before appropriate models can be developed that reflect the true value of a customer to the firm and can be applied to the situations in which the basic model is unsuited. Moreover, there is a real need to begin this work sooner rather than later. Considerable hyperbole has surrounded the advent of CRM as the wave of the future. Yet the underlying financial models needed to support truly effective CRM simply do not exist at this time. Already some in the management press are criticizing CRM as just another management fad promising more than it can deliver, whereas others view it as largely an information technology initiative. Unfortunately, there is reason to be concerned that this needed research will not be pursued. Reviewers at marketing journals are quick to reject a submission on the grounds that it "isn't really marketing" and belongs in a journal in another field such as finance. Ironically, journals in other functional areas such as operations and strategy have been quick to accept marketing ideas and build substantial research streams around them. It would be damaging to marketing if the critical research on customer valuation were to be published in strategy or finance journals. Such will be the case unless marketing scholars become more receptive to technical research focused on how to value intangible assets such as a customer relationship.

There is also a need to change the way we teach marketing at the undergraduate and graduate levels. Marketing classes can no longer be the refuge for students who "can't do numbers." At the introductory level, students should be exposed to basic models linking marketing assets to shareholder value. This basic understanding can then be leveraged in advanced marketing courses that focus on more complete models of the financial value of customer assets. Such an approach is needed to prepare marketing students to perform effectively in firms where marketing managers come under increasing pressure to justify the potential of their programs to create shareholder value.

This is an exciting time to be a Marketing scholar. Researchers are faced with a substantial opportunity to improve marketing management through the development of more effective models to value customer assets. We hope that this article contributes to these efforts in some small way by identifying some of the boundaries of our current knowledge of the topic.

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