
Customer Profitability

Introduction

This note covers metrics that measure the performance of individual customer relationships. Just as some brands are more profitable than others, so too are some customer relationships more profitable than others. Customer profit is a metric that summarizes the past financial performance of a customer relationship. Customer lifetime value (CLV) looks forward in an attempt to put a dollar figure on existing customer relationships. One of the more important uses of CLV is to inform prospecting decisions.

This note also considers acquisition and retention spending—spending designed to acquire new customers and spending designed to retain and profit from existing customers.

Customers, Recency, and Retention

These three metrics are used to count customers and track customer activity irrespective of the number of transactions (or dollar value of those transactions) made by each customer.

Counting customers

Only in the last 10 years have most marketers worried about developing metrics that focus on individual customers. In order to begin to think about managing individual customer relationships, the firm must first be able to count its customers. Although consistency in counting customers is probably more important than formulating a precise definition, a definition is needed nonetheless. The general definition of a customer is as follows.

Customer: A person or business that buys from the firm.

Customer counts are the number of customers of a firm for a specified time period. In contractual situations, it should be fairly easy to count how many customers are under contract at any point in time. Thus, Vodafone Australia,¹ a global mobile phone company, was able to report 2.6 million direct customers at the end of the December quarter.

¹ “Vodafone Australia Gains Customers,” January 26, 2005, *Sydney Morning Herald*.

In contractual situations, one complication in counting customers is the handling of contracts that cover two or more individuals. Does a family plan that includes five phones but one bill count as one or five? Does a business-to-business contract with one base fee and charges for each of 1,000 phones in use count as one or 1,000 customers? Does the answer to the previous question depend on whether the individual users pay Vodafone, pay their company, or pay nothing? In situations such as these, the firm must select some standard definition of a customer (policy holder, member) and implement it consistently.

A second complication in counting customers in contractual situations is the treatment of customers that have multiple contracts with a single firm. USAA, a global insurance and diversified financial services association, provides insurance and financial services to the U.S. military community and their families. Each customer is considered a member, complete with a unique membership number. This allows USAA to know exactly how many members it has at any time—more than five million at the end of 2004—most of whom avail themselves of a variety of member services.

For other financial-services companies, however, counts are often listed separately for each line of business. The 2003 annual report for State Farm Insurance, for example, lists a total of 73.9 million policies and accounts with a pie chart showing the percentage breakdown among auto, homeowners, life, annuities, etc. Clearly the 73.9 million is a count of policies and not customers. Presumably, since some customers use State Farm for auto, home, and life insurance, they get double and even triple counted in the 73.9 million number. Since State Farm knows the name and addresses of all their policy holders, it seems feasible that it could count how many individual customers it serves. The fact that State Farm reports policies and not customers suggests an emphasis on selling policies rather than managing customer relationships.

Finally, we offer the example of a natural gas company that went out of its way to double count customers—defining a customer to be “a consumer of natural gas distributed in any one billing period at one location through one meter. An entity using gas at separate locations is considered a separate customer at each location.” For this natural gas company, customers were synonymous with meters. This is probably a great way to view things if your job is to install and service meters. It is not such a great way to view things if your job is to market natural gas.

In noncontractual situations, the ability of the firm to count customers depends on whether or not individual customers are identifiable. If customers are not identifiable, firms can only count visits and/or transactions. Because Wal-Mart does not identify all of its shoppers, their customer counts are nothing more than the number of transactions that go through the cash registers in a day (week, year). These “traffic” counts are akin to turnstile numbers at sporting events and visits to a website. In one sense they count people, but when summed over several periods they no longer measure separate individuals. So, whereas home attendance at Atlanta Braves games in 1993² was 3,884,720, the number of people attending one or more Braves games that year was smaller.

A complication occurs in noncontractual situations with identifiable customers (direct mail, retailers with frequent-shopper cards, warehouse clubs, purchases of rental cars and lodging that require registration) when customer purchase activity is sporadic. Whereas the *New York Times* knows exactly how many *current* subscribers it has, newsstand sales are not contractual and are more difficult to forecast. For cataloger L.L. Bean, the sporadic buying of its customers means that it makes no sense to talk about the number of *current* L.L. Bean customers: L.L. Bean will know the number of orders it receives daily, it will know the number of catalogs it mails monthly, but it cannot be expected to know the number of current customers it has ... because it is difficult to define a “current” customer.

² “Atlanta Braves Attendance, Stadiums, and Park Factors,” <http://www.baseball-reference.com/teams/ATL/attend.shtml> (accessed Nov. 5, 2015).

Recency

Instead, firms in noncontractual situations count how many customers have bought within a certain period of time. This is the concept of recency—the length of time since the last purchase. Customers with recency of one year or less are customers who bought within the last year. Firms in noncontractual situations with identifiable customers will count customers of various recencies.

Recency: The length of time since a customer's last purchase.

For example, eBay reported 60.5 million active users in the first quarter of 2005. Active users were defined as the number of users of the eBay platform who bid, bought, or listed an item within the previous 12-month period. The company goes on to report that 45.1 million active users were reported in the same period of 2004.

Notice that eBay counts “active users” rather than “customers” and uses the concept of recency to track its number of active users across time. The number of active (12-month) users increased from 45.1 million to 60.5 million in one year. This tells the firm that the number of active customers increased—in part because of customer acquisition. A measure of how well the firm maintained existing customer relationships is the percentage of the 45.1 million active users one year ago who were active in the previous 12 months. That ratio measures something very similar to retention in that it reflects the percentage of active users who remained active in the subsequent period.

Retention

Retention is easily applied to contractual situations in which customers are either retained or they are not. Customers either renew their magazine subscriptions or let them run out. Customers maintain a checking account with a bank until they close it out. Renters pay rent until they move out. These are examples of pure customer-retention situations where customers are either retained or considered lost for good. In these situations, firms pay close attention to retention rates.

Retention rate: The ratio of the number of customers retained to the number at risk.

If 40,000 subscriptions to *Fortune* magazine are set to expire in July, and the publisher convinces 26,000 of those customers to renew, the publisher has retained 65% of its subscribers.

The complement of retention is *attrition* or *churn*. The attrition rate for the 40,000 *Fortune* subscribers was 35%.

Notice that this definition of retention is a ratio of the number retained to the number *at risk* (of not being retained). The key feature of this definition is that a customer must be at risk of leaving in order to be counted as a customer successfully retained. This means that the large number of customers whose subscriptions were set to run out in later months are not at risk and are not considered when calculating the July retention rate.

Finally, it sometimes makes better sense to measure retention in “customer time” rather than “calendar time.” Instead of asking what the firm's retention rate was in 2004, it may be more informative to ask what percentage of customers surviving for three years is retained throughout year four.

The ratio of the total number of customers at the end of the period to the number at the beginning of the period is not a true retention rate. Retention during the period does affect this ratio, but so too do acquisitions made during the period.

The percentage of customers starting the period who remained customers throughout the period is a lot closer to being a retention rate. This percentage would be a true retention rate if all the customers starting the period were at risk of leaving during the period.

Customer Profit

Companies commonly look at their performance in aggregate: “We had a good year and the business units delivered \$400,000 in profits.” When customers are considered, it is often using an average such as, “We made a profit of \$2.50 per customer.” While these can be useful metrics, they disguise an important fact that not all customers are equal and, worse yet, some are unprofitable. Simply put, rather than measuring the “average customer,” firms can learn a lot by finding out what each customer contributes to the bottom line.³

Customer profitability: The difference between the revenues earned from, and the costs associated with, the customer relationship during a specified period.

The overall profitability of the company can be improved by treating individual customers differently.

In essence, think of three different tiers of customer:

Top-tier customers—**REWARD:** Your most valuable customers are the ones you most want to retain. They should receive more of your attention than any other group. If you lose customers in the top tier, your profit suffers the most. Look to reward them in ways other than simply lowering your price. These customers probably value what you do the most and may not be price-sensitive.

Second-tier customers—**GROW:** The customers with middle-to-low profits might be targeted for growth. This tier will include some customers you may be able to develop into top-tier customers. Look to the share of customer metrics to help figure out which customers have the most growth potential.

Third-tier customers—**FIRE:** The company loses money serving these customers. Ideally, if you cannot easily move them into the higher tiers, you should charge them more for the services they currently consume. If you can recognize this group beforehand, try not to acquire these customers in the first place.

A database that can analyze the profitability of customers at an individual level can be a competitive advantage. If you can figure out profitability by customer, you have a chance to defend your best customers and maybe even poach the most profitable consumers from your competitors.

Calculating customer profitability

In theory this is a trouble-free calculation. Find out the cost to serve each customer and the revenues associated with each customer for a given period. Do the subtraction to get profit for the customer. While painless in theory, large companies with a multitude of customers will find this nearly impossible with even the most sophisticated of databases.

To perform the analysis with large databases, it may be necessary to abandon the notion of calculating profit for each individual customer and work with meaningful groups of customers instead.

³ P.E. Pfeifer, M.E. Haskins, and R.M. Conroy. “Customer Lifetime Value, Customer Profitability, and the Treatment of Acquisition Spending.” *Journal of Managerial Issues* 27, no. 1 (2005): 11–25.

After sorting the list of customer profits (or customer-group profits), we plot the cumulative percentage of total profits versus the cumulative percentage of total customers. Cumulative profitability will increase sharply and decelerate from the very beginning. (Remember, customers have been sorted from most to least profitable.) Whenever there are some negative-profit customers, the graph reaches a peak profit per customer moves from positive to negative. Continuing through the negative profit customers, cumulative profits eventually decrease at an ever increasing rate. The graph always ends at 100% of the customers accounting for 100% of the total profit.

Robert Kaplan (co-developer of activity-based costing and the Balanced Scorecard) likes to refer to these curves as whale curves (see **Figure 1**).⁴

In Kaplan's experience, the whale curve usually reveals that the most profitable 20% of customers generates between 150% and 300% of total profits, so that the resulting curve resembles the head of a sperm whale rising above the water's surface.

Example: A catalog retailer has grouped customers into 10 deciles based on profitability (see **Tables 1** and **2**; **Figure 2**). (A decile is one-tenth of the population—so 0% to 10% is the most profitable decile of customers).

Figure 1. The whale curve.

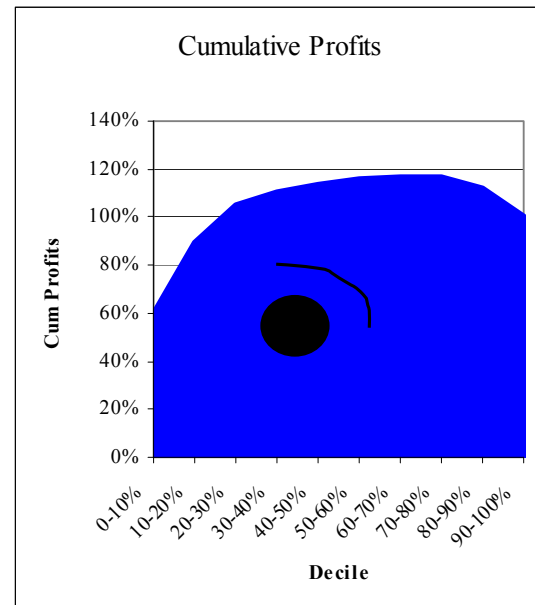
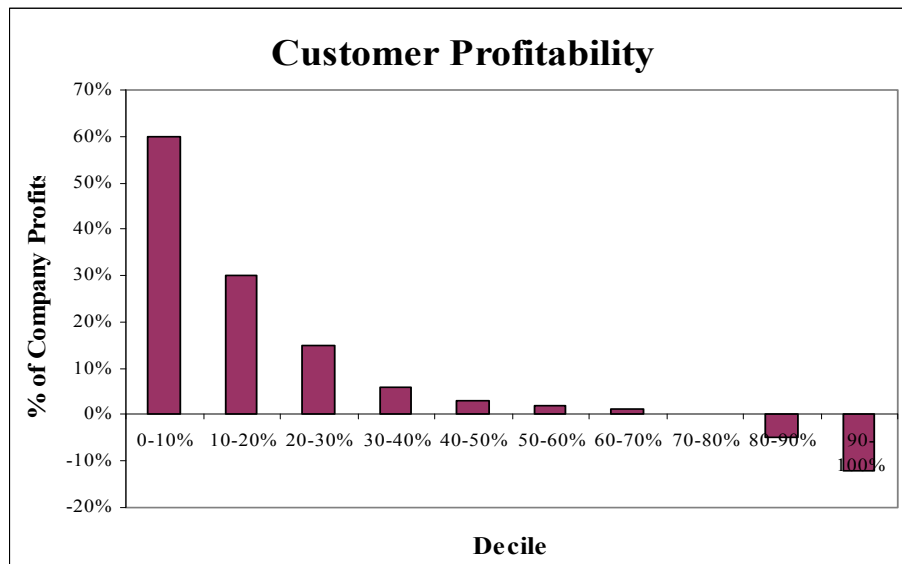


Table 1. Customer profitability ranked by profitability.

Customer Decile by Profitability (%)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Band (\$M) Profitability	\$100	\$50	\$25	\$10	\$5	\$3	\$2	\$0	(\$8)	(\$20)
% of Total Profits	60%	30%	15%	6%	3%	2%	1%	0%	(5%)	(12%)

⁴ R.S. Kaplan and V.G. Narayanan. "Measuring and Managing Customer Profitability." *Journal of Cost Management* 15, no. 5 (2001): 5-15.

Figure 2. Customer profitability by decile.



Note: These cumulative profits plotted across deciles give us the whale curve in **Figure 1**.

Table 2. Cumulative profitability peaks before all customers are served.

Customer Profitability Decile (%)	0-10	10-20	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
Cumulative Profits (\$)	\$100	\$150	\$175	\$185	\$190	\$193	\$195	\$195	\$187	\$167
Cumulative Profits (%)	59.9%	89.8%	104.8%	110.8%	113.8%	115.6%	116.8%	116.8%	112.0%	100.0%

Why doesn't every firm do this?

Measuring customer profitability requires detailed information. Assigning revenues to customers is often the easy part. Assigning costs to customers is much harder. The cost of goods sold obviously gets assigned to the customers based on the goods each customer purchased. Assigning the more indirect costs may require use of some form of activity-based costing system.

Finally, there may be some categories of costs that will be impossible to assign to individual customers. If so, it is probably best to keep these costs as company costs and be content with the customer profit numbers adding up to something less than the total company profit.

When considering the profits from customers, it must be remembered that most things change over time. Customers who were profitable last year may not be profitable this year. Since the whale curve reflects past performance, be careful when using it to make decisions that shape the future. For example, a firm may very well want to continue a relationship that was unprofitable in the past if it knows things will change for the better in the future. For example, banks typically offer discount packages to students to gain their business. This may well show low or negative customer profits in the short term. The “plan” enables future profits to compensate for current losses. CLV is a forward-looking metric that attempts to account for the anticipated future profitability of each customer relationship.

When capturing customer information to decide which customers to serve, it is important to consider the legal environment in which the company operates. This can change considerably across countries, where there may be antidiscrimination laws and special situations in some industries. For instance, public utilities are sometimes obligated to serve all customers.

It is also worth remembering that intrusive capturing of customer-specific data can damage customer relationships. Some individuals will be put off by excess data gathering. Although a packaged-food company may be very interested to find out which of its customers are on a diet, it should think twice before including that question on its next survey.

Sometimes there are sound financial reasons for continuing to serve unprofitable customers. For example, some companies rely on network effects. Take the case of the U.S. Postal Service—part of its strength is the ability to deliver to the whole country. It may superficially seem profitable to stop deliveries to remote areas. But once that happens, the service becomes less valuable for all customers. In short, sometimes unprofitable customer relationships are necessary for the firm to maintain their profitable ones.

Similarly, companies with high fixed costs that have been assigned to customers during the construction of customer profit must ask if those costs will go away if they terminate unprofitable customer relationships. If the costs do not go away, ending unprofitable relationships may only serve to make the surviving relationships look even less profitable (after the reallocation of costs), and result in the lowering of company customer profits. In short, make certain that the negative profit goes away if the relationship is terminated. Certainly, the revenue and cost of goods sold will go away, but if some of the other costs do not, the firm can be better off maintaining what on paper is a negative-profit relationship if it contributes something to covering fixed cost.

Abandoning customers is a very sensitive practice, and a business should always consider the public-relations consequences of such actions.

Finally, because the whale curve examines cumulative percentage of total profits, the numbers are very sensitive to the dollar amount of total profit. When the total dollar profit is a small number, it is fairly easy for the most profitable customers to represent a huge percentage of that small number. So when you hear that 20% of the firm's customers represent 350% of the firm's profit, one of the first things you should consider is the total dollar value of profits. If that total is small, 350% of it can also be a fairly small amount of dollars. To cement this idea, ask yourself what the whale curve would look like for a firm with \$0 profit.

Customer Lifetime Value

As Don Peppers and Martha Rogers are fond of saying, “Some customers are more equal than others.”⁵ As we noted, customer profit (CP) is the difference between the revenues and the costs associated with the customer relationship during a specified period. The central difference between CP and CLV is that CP measures the past and CLV looks forward. As such, CLV can be more useful in shaping managers' decisions, but is much more difficult to quantify. Quantifying CP is a matter of carefully reporting and summarizing the results of past activity, whereas quantifying CLV involves forecasting future activity.

Customer Lifetime Value: The present value of the future cash flows attributed to the customer relationship.

⁵ D. Peppers and M. Rogers, *Enterprise One to One: Tools for Competing in the Interactive Age* (New York: Currency Doubleday, 1997).

The concept of CLV is nothing more than the concept of present value applied to the cash flows of the customer relationship. The present value of any stream of future cash flows is designed to measure the single lump sum value, today, of those future cash flows. CLV represents the single lump sum value, today, of the customer relationship. Even more simply, CLV is the dollar value of the customer relationship to the firm. It is an upper bound on what the firm would be willing to pay to acquire the customer relationship as well as an upper bound on the amount the firm would be willing to pay to avoid losing the customer relationship. If we view a customer relationship as an asset of the firm, CLV would represent the dollar value of that asset.

Cohort and incubate

One way to project the value of future customer cash flows is to make the heroic assumption that the customers acquired several periods ago are no better or worse (in terms of their CLV) than the ones currently acquired. We then go back and collect data on a cohort of customers all acquired at about the same time, and carefully reconstruct their cash flows over some finite number of periods. The next step is to discount the cash flow for each customer back to the time of acquisition to calculate that sample customer's CLV, and then average all of the sample CLVs together to produce an estimate of the CLV of each newly acquired customer. We refer to this method as the cohort-and-incubate approach. Equivalently, one can calculate the present value of the *total* cash flow from the cohort and divide by the number of customers to get the average CLV for the cohort. If the value of customer relationships is stable across time, the average CLV of the cohort sample is an appropriate estimator of the CLV of newly acquired customers.

As an example of this cohort-and-incubate approach, Berger, Weinberg, and Hanna followed all the customers acquired by a cruise-ship line in 1993. The 6,094 customers in the cohort of 1993 were tracked (incubated) for five years. The total net present value (NPV) of the cash flows from these customers was \$27,916,614. These flows included revenue from the cruises taken (the 6,094 customers took 8,660 cruises over the five-year horizon), variable cost of the cruises, and promotional costs. The total five-year NPV of the cohort expressed on a per-customer basis came out to be $\$27,916,614 / 6,094$ or \$4,581 per customer. This is the average five-year CLV for the cohort.

Prior to this analysis, [cruise-line] management would never spend more than \$3,314 to acquire a passenger...Now, aware of CLV (both the concept and the actual numerical results), an advertisement that [resulted in a cost per acquisition of \$3,000–\$4,000] was welcomed—especially since the CLV numbers are conservative (again, as noted, the CLV does not include any residual business after five years.)⁶

The cohort-and-incubate approach works well when customer relationships are stationary—changing slowly over time. When the value of relationships changes slowly, a company can use the value of incubated past relationships as predictive of the value of new relationships.

In situations where the value of customer relationships changes more rapidly, firms often use a simple model to forecast the value of those relationships. A model just means some assumptions about how the customer relationship will unfold. If the model is simple enough, it may even be possible to find an equation for the present value of our model of future cash flows. This makes the calculation of CLV even easier as it now requires only the substitution of numbers for our situation into the equation for CLV.

⁶ P.D. Berger, B. Weinberg, and R. Hanna, "Customer Lifetime Value Determination and Strategic Implications for a Cruise-Ship Line," *Database Marketing and Customer Strategy Management* 11, no. 1 (2003): 40–52.

Next, we will explain what is perhaps the simplest model for future customer cash flows and the equation for the present value of those expected cash flows. While not the only model of future customer cash flows, this one gets used the most.

Customer lifetime value model

The CLV formula⁷ (**Equation 1**) multiplies the per-period cash margin, $\$M$, by a factor that represents the present value of the customer relationship's expected length:

$$CLV = \$M \left[\frac{r}{1 + d - r} \right] \quad (1)$$

where r is the per-period retention rate and d is the per-period discount rate.

So, in the model, CLV is a multiple of $\$M$, the per-period dollar margin (net of retention spending). The multiplicative factor represents the present value of the expected length (number of periods) of the customer relationship. When $r = 0$ the customer will never be retained, and the multiplicative factor is zero. When $r = 1$ the customer is always retained, and the firm receives $\$M$ in perpetuity. The present value of the $\$M$ in perpetuity turns out to be $\$M / d$. For retention values in between, the CLV formula tells us the appropriate multiplier.

Example: An Internet service provider charges \$19.95 per month. Variable costs are about \$1.50 per account per month. With marketing spending of \$6 per year, their attrition is only 0.5% per month. At a monthly discount rate of 1%, what is the CLV of a customer?

$$\begin{aligned} \$M &= (\$19.95 - \$1.50 - \$6/12) \\ &= \$17.95 \\ r &= 0.995 \\ d &= 0.01 \\ CLV &= \$M \times [r / (1 + d - r)] \\ CLV &= \$17.95 \times [0.995 / (1 + 0.01 - 0.995)] \\ CLV &= (\$17.95) \times (66.33) \\ CLV &= \$1,191. \end{aligned}$$

Limitations of the CLV model

The model for customer cash flows treats the firm's customer relationships as something of a leaky bucket. In each period, a fraction (one less the retention rate) of the firm's customers leave and are lost for good.

The CLV model has only three parameters: (1) constant margin (contribution after deducting variable costs including retention spending) per period; (2) constant retention probability per period; and (3) discount rate. Furthermore, the model assumes that in the event the customers are not retained, they are lost for good. Finally, the model assumes the first margin will be received (with probability equal to the retention rate) at the *end* of the first period.

⁷ Sunil Gupta and Donald R. Lehmann, "Customers as Assets," *Journal of Interactive Marketing* 17, no. 1 (2002): 9–24.

The one other assumption of the model is that the firm uses an infinite horizon when it calculates the present value of future cash flows. Although no firm actually has an infinite horizon, the consequences of assuming one are discussed in the next section.

The retention rate (and by extension the attrition rate) is a driver of CLV. Very small changes can make a major difference to the lifetime value calculated. Accuracy in this parameter is vital to meaningful results.

The retention rate is assumed to be constant across the life of the customer relationship. For products and services that go through a trial, conversion, and loyalty progression, retention rates will increase over the lifetime of the relationship. In those situations, the model given here might be too simple. If the firm wishes to utilize a sequence of retention rates, a spreadsheet model can be used to calculate CLV.

The contribution is assumed to be constant across time. If the margin is expected to increase or decrease with the duration of the customer relationship, the simple model will not apply.

Take care not to use this CLV formula for relationships in which customer inactivity does not signal the end of the relationship. In catalogs, for example, a small percentage of the firm's customers purchase from any given catalog. Don't confuse the percentage of customers active in a given period (relevant for the cataloger) with the retention rates in this model. If customers often return to do business with the firm after a period of inactivity, the CLV formula above does not apply.

The infinite horizon assumption

In some industries and companies it is typical to calculate four- or five-year customer values instead of using the infinite time horizon inherent in **Equation 1**. Of course, over shorter periods customer retention rates are less likely to be affected by major shifts in technology or competitive strategies, and are more likely to be captured by historical retention rates. For managers, the question is: "Does it make a difference whether I use the infinite time horizon or the (for example) five-year customer value?" The answer to this question is "Yes, sometimes it can make a difference as the value over five years can be less than 70% of the value over an infinite horizon."

Table 3 calculates the percentages of (infinite horizon) CLV accruing in the first five years. If retention rates are higher than 80% and discount rates are lower than 20%, differences in the two approaches will be substantial. Depending on the strategic risks that companies perceive, the additional complexities of using a finite horizon may be informative.

CLV with initial margin

If you consult other sources on CLV, you may encounter a slightly different formula for CLV (see **Equation 2**).

$$CLV_{alternative} = \$M \left[\frac{1+d}{1+d-r} \right] \quad (2)$$

This alternative formula applies to a situation in which the initial cash flow is a certain $\$M$ received at the *beginning* of the first period. Because of this, this alternative formula always comes out to be $\$M$ higher than the original formula.

Table 3. Five-year CLV as a percentage of infinite-horizon CLV.

<i>Percent of CLV Accruing in First Five Years</i>						
Discount Rate	Retention Rate					
	40%	50%	60%	70%	80%	90%
2%	99%	97%	93%	85%	70%	47%
4%	99%	97%	94%	86%	73%	51%
6%	99%	98%	94%	87%	76%	56%
8%	99%	98%	95%	89%	78%	60%
10%	99%	98%	95%	90%	80%	63%
12%	99%	98%	96%	90%	81%	66%
14%	99%	98%	96%	91%	83%	69%
16%	100%	99%	96%	92%	84%	72%
18%	100%	99%	97%	93%	86%	74%
20%	100%	99%	97%	93%	87%	76%

Prospect Lifetime Value

One of the major uses of CLV is to inform prospecting decisions. A prospect is someone whom the firm will spend money on in an attempt to acquire her or him as a customer. The acquisition spending must be compared not just to the contribution from the immediate sales it generates, but also to the future cash flows expected from the newly acquired customer relationship (the CLV). Only with a full accounting of the value of the newly acquired customer relationship will the firm be able to make informed, economic-prospecting decisions.

The expected prospect lifetime value (PLV) will be the value expected from each prospect minus the cost of prospecting. The value expected from each prospect will be a , the expected fraction of prospects who will make a purchase and become customers, times $(\$M_0 + CLV)$, where $\$M_0$ is the average margin the firm makes on the initial purchases net of any marketing spending used to attempt to retain the customer at the end of the first period. The cost will be $\$A$, the amount of acquisition spending per prospect. The formula for expected PLV is shown in **Equation 3**:

$$PLV = a(\$M_0 + CLV) - \$A \quad (3)$$

If PLV is positive, the acquisition spending is a wise investment. If PLV is negative, the acquisition spending should not be made.

The PLV number will usually be very small. While CLV is sometimes in the hundreds of dollars, PLV can come out to be only a few pennies. Just remember that PLV applies to prospects, not customers. A large number of small- but positive-value prospects can add to a considerable amount of value for a firm.

Example: A service company plans to spend \$60,000 on an advertisement reaching 75,000 readers. If the service company expects the advertisement to convince 1.2% of the readers to take advantage of a special introductory offer (priced so low that the firm makes \$10 margin on this initial purchase) and the CLV of the acquired customers is \$100, is the advertisement economically attractive?

Here, $\$A$ is \$0.80, a is 0.012, and $\$M_0$ is \$10. The PLV of each of the 75,000 prospects is

$$\begin{aligned} PLV &= a(\$M_0 + CLV) - \$A \\ &= 0.012 \times (\$10 + \$100) - \$0.80 \\ &= \$0.52. \end{aligned}$$

The expected lifetime value of a prospect is \$0.52. The total expected value of the prospecting effort will be $75,000 \times \$0.52 = \$39,000$. The proposed acquisition spending is economically attractive.

If we are uncertain about the 0.012 acquisition rate, we might ask what the response rate from the prospecting campaign must be in order for it to be economically successful. We can get that number using Excel's goal seek function to find the a value that sets PLV to zero. Or we can use a little algebra and substitute \$0 in for PLV and solve for a (**Equation 4**):

$$\begin{aligned} a_{be} &= \frac{\$A}{\$M_0 + CLV} \\ &= \$0.80 / (\$10 + \$100) \\ &= 0.007273. \end{aligned} \tag{4}$$

The acquisition rate must exceed 0.7273% in order for the campaign to break even on an NPV basis.

Issues with PLV

Perhaps the biggest challenge in calculating PLV will be estimating the CLV. The other terms (acquisition spending, expected acquisition rates, and initial margin) all refer to flows or outcomes in the near future, whereas CLV requires longer term projections.

Another caution worth mentioning is the decision to spend money on customer acquisition whenever PLV is positive. This rests on an assumption that the customers acquired would not have been acquired had the firm not spent the money. In other words, this approach gives the acquisition spending full credit for the subsequent customers acquired. If the firm has several simultaneous acquisition efforts, for example, dropping one of them might lead to increased acquisition rates for the others. Situations such as these (where one solicitation cannibalizes another) require a more complicated analysis.

The firm must be careful to search for the most economical way of acquiring new customers. If there are alternative prospecting approaches, the firm must be careful not to simply go with the first one that gives a positive projected PLV. Given a limited number of prospects, the approach that gives the highest expected PLV should be used.

Finally, we want to warn you that there are other ways to perform the calculations necessary to judge the economic viability of a given prospecting effort. While these other approaches are equivalent to the one presented here, they differ with respect to what gets included in CLV.

Some will include the initial margin as part of CLV. For our service company example, this approach would say that the CLV is \$110.

Another common approach will include both the initial margin and the expected acquisition cost per acquired customer as part of the CLV. For the service company example, this CLV will equal $\$110 - \$60,000 / 900 = \$43.33$. Here, 900 is the expected number of new customers and the $\$60,000 / 900$ is the expected

cost per new customer. The \$43.33 is the expected value of the prospecting effort expressed on a per-customer-acquired basis. If this CLV is positive, the prospecting effort is economically attractive.

Notice that \$43.33 times the 900 expected new customers equals \$39,000, the same total net value from the campaign calculated in the original example. The two ways to do the calculations are equivalent.

Acquisition and Retention Cost

Before the firm can optimize its mix of acquisition and retention spending, it must assess the status quo. At the current spending levels, what does it cost the firm (on average) to acquire new customers, and how much does it cost (on average) to retain its existing customers? Does the oft-repeated maxim, “it costs five times as much to acquire a new customer as it does to retain an existing one” hold for most firms?

Average Acquisition Cost: The average cost to acquire a customer; it is the total acquisition spending divided by the number of new customers acquired (**Equation 5**).

$$\text{Average Acquisition Cost (\$)} = \text{Acquisition Spending (\$)} / \text{Number of Customers Acquired (\#)} \quad (5)$$

Average Retention Cost: The average cost to retain the average customer; it is the total retention spending divided by the number of customers retained (**Equation 6**).

$$\text{Average Retention Cost (\$)} = \text{Retention Spending (\$)} / \text{Number of Customers Retained (\#)} \quad (6)$$

Example: During the past year a regional pest-control service spent \$1.4 million and acquired 64,800 new customers. Of the 154,890 customer relationships in existence at the start of the year, only 87,957 remained at the end of the year, despite about \$500,000 spent during the year in attempts to retain the 154,890 customers.

The calculation of average acquisition cost is relatively straightforward. A total of \$1.4 million resulted in 64,800 new customers. The average acquisition cost is $\$1,400 / 64.8 = \21.60 per customer.

The calculation of average retention cost is also straightforward. A total of \$500,000 resulted in 87,957 retained customers. The average yearly retention cost is $\$500,000 / 87,957 = \5.68 .

Thus, for the pest-control firm it cost about *four* times as much to acquire a new customer as it did to retain an existing one.

For any predetermined period, the firm needs to know the total amount it spent on customer acquisition and the number of new customers that resulted from that spending. Regarding customer retention, the firm needs to know the total amount spent during the period attempting to retain the customers in existence at the start of the period; as well, it must determine the number of the existing customers successfully retained at the end of the period. Notice that retention spending directed at customers acquired within the period is not included in this figure. Similarly, the number retained refers only to those retained from the pool of customers in existence at the start of the period. Thus, the average retention cost calculated will be associated with the length of the period in question. If the period is a year, the average retention cost will be a cost per-year, per-customer retained.

The calculation and interpretation of average acquisition cost is much easier than the calculation and interpretation of average retention cost. This is so because it is often possible to isolate acquisition spending and count the number of new customers that resulted from the spending. A simple division results in the

average cost to acquire a customer. The reasonable assumption underlying this calculation is that the new customers would not have been acquired had it not been for the acquisition spending.

Things are not nearly so clear when it comes to average retention cost. One source of difficulty is the retention rates (and costs), which depend on the period of time under consideration. Yearly retention is different from monthly retention. The cost to retain a customer for a month will be less than the cost to retain a customer for a year. Thus, the definition of average retention cost requires a specification of the time period associated with the retention.

A second source of difficulty emerges because some customers will be retained even if the firm spends nothing on retention. For this reason it may be a little misleading to call the ratio of retention spending to the number of retained customers the average retention cost. One must not jump to the conclusion that retention goes away if the retention spending goes away. Nor should one assume that if the firm increases the retention budget by the average retention cost that it will retain one more customer. The average retention cost number is not very useful to help make retention budgeting decisions.

One final caution involves the firm's ability to separate spending into acquisition and retention classifications. Clearly, there can be spending that works to improve both the acquisition and retention efforts of the firm. General brand advertisements, for example, serve to lower the cost of both acquisition and retention. Rather than attempt to allocate all spending as either acquisition or retention, it is perfectly acceptable to maintain a separate category that is neither acquisition nor retention.

Retention and Customer Lifetime Value

Reichheld and Sasser (1990) helped popularize the idea that customer retention is an important driver of firm financial success. They reported that “reducing defections by 5% boosts profits 25% to 85%.”⁸ Rather than rely on the Reichheld and Sasser percentages, we offer three approaches for quantifying the economic benefits of increased retention for a given firm.⁹

In the first approach, the firm might build an electronic spreadsheet model to forecast future company profits and cash flows as a function of a retention rate or schedule of retention rates. One could then change the retention rate or schedule of retention rates and observe what happens to profits and cash flows. These “what-if” analyses conducted using a spreadsheet model would be one way to quantify the benefits of increased retention. If the firm thought, for example, that increased retention would reduce the need for future acquisition spending, that linkage could be built into the model and captured in the what-if analyses.

The second and third approaches ask how increased retention affects the lifetime value of the customer. Whereas the firm-level spreadsheet approach above projects the future stream of company profits and cash flows, CLV accounts for the dollar value of the future cash flows attributed to the customer—either a single customer or (more than likely) an average customer.

In the second approach, the firm might build an electronic spreadsheet model of future cash flows associated with the customer relationship. That model might allow for margins and retention rates to increase with customer tenure. The present value of the projected future cash flows would be the estimated CLV. To

⁸ Fredrick F. Reichheld and W. Earl Sasser, Jr., “Zero Defections: Quality Comes to Services,” *Harvard Business Review* September–October (1990): 105–111.

⁹ P.E. Pfeifer, and P.W. Farris, “The Elasticity of Customer Value to Retention: The Duration of a Customer Relationship,” *Journal of Interactive Marketing* 18 no. 2 (Spring 2004): 20–31.

quantify the economic benefits of increased retention, once again the firm could conduct what-if sensitivities using the model of customer cash flows. For example, one might multiply the schedule of retention rates by 1.01 and recalculate the CLV. The resulting number would represent the CLV if all retention rates increased by 1%.

In the third approach, the firm might assume constant margins and retention rates and perform what-if analyses directly on formula for the CLV presented earlier in this note.

Example: Consider again the customer relationship where $\$M = \17.95 , $d = 0.01$, and $r = 0.995$. The calculated CLV was \$1,191. Now suppose the firm expected r to increase to 0.996 as a result of several recent customer-relationship management initiatives.

To quantify the benefits of the expected increased retention, we calculate CLV for $r = 0.996$ and get CLV = \$1,277 (an increase of about 7.2%).

When using the CLV formula, remember the timing assumptions inherent in this formula. The formula applies to current customers whose next cash flow occurs in one period in the event they are retained. This timing assumption is conservative because, in actuality, the firm's current customers will be spread throughout the renewal cycle. For some customers the renewal event will be imminent, not a full period away.

The change in CLV for a change in retention rate is a measure of the increase in dollar value of the firm's current customer base. This dollar value does not translate directly to an equivalent increase in yearly profits as there are many other factors affecting firm profits. If the firm wishes to measure the impact of increased retention rate on yearly profits, a firm-level model described in approach one is required.

The firm should also remember that increases in retention rate not only affect the value of the firm's current customers, but also the value of the firm's current prospects whenever the increases in retention rate are expected to also apply to customers the firm will acquire in the future.

The economic benefits of increased retention must be compared to the costs required to achieve the increased retention rates in order to make a sound investment decision.

Summary

This note introduces the major concepts and metrics associated with customer-relationship marketing. In addition to measuring and managing the firm's portfolio of products, marketers today are often in a position to measure and manage the firm's portfolio of customer relationships. In situations where acquiring and serving individual customers is the key to business success, the concepts and metrics in this note will be useful.