

A NOTE ON CUSTOMER LIFE TIME VALUE (CLV)

While some purchases occur only once in a lifetime or very infrequently, customers often purchase repeatedly at various time intervals. In many markets, from consulting services to razor blades to mp3 music files, customers vary in their repeat purchase rate, and in the extent to which they buy from the same vendor or from competitors. Increasingly, marketing strategies focus on the financial value that customers provide over time for three important reasons. First, the increasing focus on customer-oriented, market-driven business strategies demands a longer-term perspective. Second, advances in marketing research and information technology have allowed managers to micro-market and data mine at the level of very small segments or even individual customers. Third, increasing emphasis on making marketing more accountable has stimulated marketers to justify investments of the value of customers over time in order to demonstrate their contribution to profitability.

Experience with CLV calculations is most advanced in industries where purchases are reasonably frequent, input data is readily available, and important marketing decisions are based on individual customer's expenditures over time. In some financial service industries, such as credit card services and car insurance, extensive customer level models have been developed. Analyses of the differences between the cost of acquiring new customers and the cost of keeping (and/or selling more to) current customers can drive strategies that lose money in the first year, but are very profitable in subsequent years. Internet start-ups, in particular, rely on this logic in developing business plans and attracting investors, albeit with inconsistent results because forecasts of revenues in years subsequent to launch are often exaggerated (the eyeballs are not as sticky or monetized as easily as assumed). Much more reliable CLV projections are possible when a product or service has been on the market for several years.

Calculating the CLV enables a marketer to predict the profitability of a customer over time. The calculation can be used to:

1. Devise marketing programs that are tailored to preferences and behaviors of target customers. For example, Harrah's Entertainment Inc. uses a loyalty card to track play preferences, betting patterns, lodging and restaurant preferences, and other data to devise targeted promotions for customers at the firm's casinos. These efforts were reputed to drive 100 percent growth rate in the stock price and profits, and revenue growth of 50 percent—far outpacing the industry.
2. Assess the *present value* of a customer over some time frame. This is a financial metric that measures the value of a customer based on revenues generated over time, discounting those revenues to take into account the cost of capital—the fact that the value of money today declines over time due to inflation or because funds could be invested in some vehicle to generate capital. For example, if a customer gives us \$100 in revenue one year from now, we could apply a discount rate of say 10 percent so that the present value of that \$100 is $\$100/1.1$.
3. Assess costs to generate revenues from customers over time. This is because calculating CLV requires the marketer to specify costs to acquire and retain customers. The CLV calculation might signal that either or both of these costs are too high. Alternatively, the marketer could conclude that the CLV is high enough to warrant even more expenditures to acquire and/or retain customers.

4. Assess brand loyalty, since another measure required to calculate CLV is the *retention rate*—that is, what proportion of our customers continue to buy our product from year to year. Of course, at least some customers will cease buying—they move, change their habits, prefer another brand, or pass away. New customers enter the market, but the CLV calculation follows a *cohort* of buyers over time.

The Basics of Customer Lifetime Value

The simplest approach to calculating and using CLV is to think of it as a form of break-even analysis in which the fixed cost is the cost of acquiring a customer and the unit contribution of a single purchase is replaced with the customer's lifetime value. That is, the calculated CLV estimates the present value of all costs and purchases after the customer has been acquired and this value is compared to the cost of acquisition; if CLV is greater than acquisition costs, the customer is projected to be profitable.

Computing CLV

$$CLV = \sum_t \text{Customer Survival Probability}_t \times \text{Net Customer Contribution}_t, \quad (1)$$

where t indexes the time periods in the customer's *lifetime*,

Customer Survival Probability_t is the probability that the average customer will still be active at time t . It captures the cumulative effects of the single period retention rates over time [e.g., if the customer retention rate in each period is r , then, after t time periods, the *Customer Survival Probability* is r^{t-1} (assuming that retention in the first time period is 100%)],

Net Customer Contribution_t is the gross contribution of the average customer at time t less any direct costs associated with the customer during that time period. These are typically the ongoing retention costs. For example, a business might offer a discount towards the end of the membership year to increase the likelihood of membership renewal.

Equation (1) ignores the opportunity cost of money (i.e., it assumes a discount rate of zero). If a discount rate of d is applied beginning at $t = 1$, then

$$CLV = \sum_t \text{Customer Survival Probability}_t \times \text{Net Customer Contribution}_t / (1+d)^t, \quad (2)$$

Example

Dollar Diaper Club [DDC] charges its customers \$365 each year. Customers pay the yearly fee in advance each year and receive diapers at home each week as long as they are members. It costs DDC \$155 per year to serve each customer. This represents cost of diapers and mailing costs. In addition to these costs, DDC spends \$10 each year as promotional discounts that are intended to increase customer satisfaction and therefore improve retention. Retention rate is quite high but some customers do drop out. A typical customer has a 70% chance of staying with DDC each year. However, as children do not need diapers after 3 years, no customer remains a member beyond 3 years. DDC's opportunity cost of money (time value of money) is 10%. In other words, DDC is indifferent between receiving \$1 today and \$1.10 a year later.

Question: What is the CLV of a typical customer? First compute CLV without accounting for the time value of money. Then revise your answer to include time value of money.

CLV for a 3-year time horizon (no discounting) where t indexes years

$$\begin{aligned}
 &= \sum_t \text{Customer Survival Probability}_t \times \text{Net Customer Contribution}_t \\
 &= 1.0 \times (\$365 - \$155 - \$10) + 0.7 \times (\$365 - \$155 - \$10) + 0.7^2 \times (\$365 - \$155 - \$10) \\
 &= \$200 + \$140 + \$98 \\
 &= \$438
 \end{aligned}$$

Customer Survival Probability_t is computed assuming that the percentage of customers retained in each period is 70%, and, after t time periods, the *Customer Survival Probability* is 0.7^{t-1} ,

Net Customer Contribution_t is \$200 (Customer pays \$365 each year, it costs \$155 to DDC to serve this customer, and DDC spends \$10 in incentives to increase customer satisfaction)

CLV for a 3-year time horizon (with discounting) where t indexes years

$$\begin{aligned}
 &= \sum_t \text{Customer Survival Probability}_t \times \text{Net Customer Contribution}_t \\
 &= 1.0 \times (\$365 - \$155 - \$10) + 0.7 \times (\$365 - \$155 - \$10)/1.1 + 0.7^2 \times (\$365 - \$155 - \$10)/1.1^2 \\
 &= \$200.00 + \$127.27 + \$80.99 \\
 &= \$408.26
 \end{aligned}$$

As the assumed discount rate is 10%, we divide by 1.1 for Year 2 and 1.1^2 in Year 3.

It is useful to note that Net Customer Contribution and Retention Rate may change from one year to another. Equations (1) and (2) do allow for these changes even though the DDC example assumed that these remain the same over the three years.

Quick CLV

Finally, if both the customer contribution margin and the retention rate remain constant, and if we can assume that the customer stays with the firm forever, one can apply the following *quick CLV* method. This back-of-an-envelope calculation is commonly called “Return Over Churn” (i.e., “return” is net customer contribution and “churn” is the attrition rate¹). These simple back of the envelope methods assume that the customer stays with the firm for a long time. When the retention rate is low, the quick CLV methods better approximate CLV estimates using the approaches discussed earlier.

$$\text{Quick CLV} = \text{Average Customer Contribution} / \text{Attrition Rate}, \quad (3)$$

where, the *Average Customer Contribution* is the annual profit contribution per customer less annual retention cost per customer and *Attrition Rate* is 1 minus the average annual retention rate.

¹ Attrition Rate = (1 – Retention Rate)

To include the opportunity cost of money, use the following approximation.

$$\text{Quick CLV} = \text{Average Customer Contribution} / (\text{Attrition Rate} + \text{Discount Rate}) \quad (4)$$

If we were to apply Equation (4) to the Diaper Dollar Club example, we get

$$\text{Quick CLV} = \$200 / (0.3 + 0.1) = \$500.$$

When we compare our Quick CLV answer (\$500) with our earlier answer (\$408.26) using Equation (2), it is worthwhile to note that the Quick CLV method over-computes CLV. Quick CLV will provide a better approximation if customers remained longer with the firm (in the case of DDC it is assumed to be only 3 years), or if the attrition rate is higher.