Customers As Assets

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Abstract

In this paper we argue that customers are important intangible assets of a firm and that these assets should be valued and managed. We use the concept of customer lifetime value, show how it can be estimated by using easily (and in most cases publicly) available data, and how it can be used for a variety of decisions such as customer acquisition, customer retention, value-based segmentation, assessing effectiveness of marketing programs, as well as for evaluating strategic alliances. We further show how it is possible to link customer value to the value of a firm. We use this approach to value Amazon and E*Trade and show how our approach provides reasonable estimates for the value of these firms while traditional financial methods fail. Finally, we provide two case studies (CDNow and AT&T Broadband) to illustrate how our approach can help in strategic decisions.

Intangible assets are, by definition, hard to see and even harder to fix a precise value for. But a widening consensus is growing that the importance of such assets -- from brand names and customer lists to trademarks and patents -- means that investors need to know more about them. ...A task force appointed by the Securities and Exchange Commission will urge the S.E.C. today to find a way to encourage companies to provide more information regarding those assets. ... As an example of possible new disclosures… companies could provide estimates on the lifetime value, in terms of revenue and profit, of a customer, as well as of the cost of acquiring new customers.

The New York Times, May 22, 2001

Business experts in general and marketing specialists in particular have long argued that brands and customers are valuable assets that need to be managed carefully.[2] It is only recently, however, that metrics for measuring and managing these assets have gained currency outside marketing.

This article focuses on one of the most important intangible asset of a company – its customers. Specifically we discuss the concept of customer lifetime value, how to measure it and how to use it for decision making. We also demonstrate its under appreciated role in understanding the value of firms.

What is Lifetime Value?

The lifetime value (LV) of a customer is the present value of all future profits generated from this customer. Conceptually this is similar to the present value or discounted cash flow (DCF) approach used in finance to make appropriate investment decisions and to estimate the value of a firm. However there are two differences from the traditional DCF approach. First, LV is generally estimated at an individual customer level rather than at the firm or business unit level. This disaggregate analysis enables many important insights, as we shall see shortly. Second, LV explicitly incorporates the fact the customers do not stay with a company forever. In other words, it accounts for customer

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[2] For a recent review see Robert Blattberg, Gary Getz and Jacqueline Thomas (2001), *Customer Equity*, HBS Press.

retention and defection. We show that this has significant implications for managerial decision-making.

Measuring Customer Lifetime Value

Three factors drive the lifetime value of customers –margins or profits from customers' purchases, customers' retention or loyalty rates and firm's cost of capital or discount rate. We briefly describe each component and then show how they can be combined to measure lifetime value.

Margins (m)

The margin for each customer is simply annual revenue minus operating expenses. Over time, there are two opposing forces that shape average margins from customers. On the positive side, as a customer stays longer with a company and becomes more comfortable doing business with a firm, it buys more and at a higher frequency generating a larger revenue stream over time. The company also has the potential of cross-selling its products to its customer base. For example, by increasing its offerings from books to include CDs and other related products, Amazon has succeeded in increasing its revenue per customer from about $50 in 1997 to almost $116 by the end of 1999. The company expects this to further increase to $150 by 2002.[3] In addition to increased revenue, in general the longer a customer stays with a company the lower is the cost of doing business with that customer.[4]

However, revenue growth does not necessarily occur for every company. In general, a firm starts by attracting customers who are most favorably disposed toward to firm's products and services. As the company expands its customer base, it tends to draw more and more marginal customers who do not spend as much money with the company as the original customers. Consequently average revenue per customer declines over time. This is especially true if company's customer base expands very rapidly, thereby changing its customer mix, and if the company is either a single product company or a company that does not emphasize cross selling. For example, at CDNow revenue per

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[3] *Business Week*, February 21, 2000.
[4] Reichheld, Frederick (1996) *The Loyalty Effect*, HBS Press.

customer fell from $23.15 to $21.16 in 1998. In the first quarter of 1999, it acquired a competitor N2K that further contributed to the decline in its revenue per customer from $18.15 in Q1 of 1999 to $14.42 in Q2 of 1999.

Customer Retention (r)

If we assume that a customer provides a continuous stream of profits for a company with certainty, we implicitly assume that this customer will be completely loyal to the products of this firm. However, as competition intensifies and products become less differentiated, customers switch from one firm to another. Some studies estimate that average annual customer retention in US is about 80% although there is significant variation across industries and also across companies within an industry.[5]

Discount Rate or Cost of Capital (i)

The final component that we need to estimate customer lifetime value is the discount rate or the cost of capital. The discount rate adjusts for the fact that money today is worth more than money tomorrow and captures the risk associated with a business. For example, the discount rate for Wal-Mart should be lower than the corresponding rate for Yahoo. For most mature companies, these rates vary between 8%-16%. For high-risk companies, e.g., Internet companies, these discount rates may be as high as 20%-30%. Discount rates depend on a company's financial structure of debt and equity. A large number of textbooks and related literature discuss how to estimate and manage this discount rate.[6]

Estimating Lifetime Value

Armed with these components, we are now ready to build a model for estimating customer lifetime value. An obvious, if tedious, way to estimate lifetime value is to build a spreadsheet for each customer by projecting his/her retention probabilities, margins etc over the next several years. While this approach is "precise", it tends to be cumbersome,

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[5] Reichheld, Frederick (1996) *The Loyalty Effect*, HBS Press.
[6] See, for example, Damodaran, Aswath (2001), *The Dark Side of Valuation: Valuing Old Tech, New Tech, and New Economy Companies*, Financial Times/Prentice Hall.

data intensive, and not very insightful. Therefore it is often helpful to build simple formulas which approximate the spreadsheet approach.

We start with a simple scenario where a customer produces a *constant* stream of annual margin (m). If the annual retention rate (r) for this customer is also constant, then his/her lifetime value (LV) is[7]

$$LV = \frac{m.r}{(1+i)} + \frac{m.r^2}{(1+i)^2} + \frac{m.r^3}{(1+i)^3} + ... = m\left(\frac{r}{1+i-r}\right)$$

The expected profit stream from a customer is computed by explicitly accounting for his/her retention rate. For example, if the retention rate is 90%, at the end of first year there is 90% chance that the customer is still with the firm. Alternatively, of 100 initial customers, only 90 are expected to stay with the firm at the end of first year. Assuming a constant retention rate, this means that at the end of second year we will be left with 90% of 90 customers, i.e. 81 customers. For an individual customer, this means that there is an 81% chance that a customer will be still with the company at the end of second year.

We do *not* need to arbitrarily specify the number of years or duration that the customer is going to stay with the company since retention rate automatically accounts for the fact that over time the chances of a customer staying with the company go down significantly. For example, if the retention rate is 80%, then after 10 years the chance of a customer staying with the company is only $(0.8)^{10} = 0.10$, and after 20 years, this reduces to $(0.8)^{20} = 0.01$. In addition to low chance of retention after 10 or more years, the margins generated in year 10 or later are also worth far less than the margin earned today. For example, at the discount rate of 12% and a retention rate of 80%, $100 is worth only $3.22 after 10 years.

Note that LV is equal to margin (m) multiplied by a factor r/(1+i-r). We call this factor "margin multiple". Table 1 shows that for the typical values of retention and discount rates the margin multiple ranges from 1.07 to 4.50. The margin multiple is low when the discount rate is high (i.e., for a risky company) and customer retention is low.

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[7] It is possible to modify this formulation for many other scenarios, for example when margins grow at a constant rate or when margin growth rate declines over time.

Conversely, this multiple is high for low risk companies with high customer retention rate. Therefore, an easy way to approximate the lifetime value of customers is to multiply the annual gross margin for a customer by a factor of 1.07 to 4.50.

Table 1

Margin Multiple

$$\frac{r}{1+i-r}$$

Retention Rate	Discount Rate			
	10%	12%	14%	16%
60%	1.20	1.15	1.11	1.07
70%	1.75	1.67	1.59	1.52
80%	2.67	2.50	2.35	2.22
90%	4.50	4.09	3.75	3.46

Using Lifetime Value for Managerial Decision Making

The concept of customer lifetime value is useful in many areas of decision making such as marketing decisions of customer acquisition and customer retention, resource allocation decisions, strategic decisions of forming alliances or mergers and acquisitions of companies, as well as for providing guidelines to CEOs and shareholders about the value of the firm. We highlight some of these topics below.[8]

Acquiring Customers

In recent years many companies, especially the dot coms, went on a binge to acquire customers in the belief that customer acquisition and rapid growth of the firm was critical to success. This belief was so strong that several companies focused on acquiring customers regardless of the acquisition cost[9]. This belief was supported by some studies that found that while valuation of many of these "new economy" firms was hard to justify on the basis of traditional financial measures such as P/E ratio, at least during their hay

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[8] For the discussion in this section we assume a 12% discount rate.
[9] "Buying the Buyers: The goal these days seems to be to attract customers, whatever they cost you," *The Wall Street Journal,* Nov 22, 1999

days (i.e., 1998-2000), customer-based metrics such as number of customers, page views etc. were strongly correlated with the market cap of these firms[10]. However, common sense suggests that to acquire a customer a company should not spend more than the LV of that customer. While some companies followed this basic economic principle, others did not.

Consider the case of E*Trade. Until last year, E*Trade lured new customers by offering them $75 to open an account. In addition, advertising and other marketing expenses added significantly to the total acquisition cost. In September 2000, acquisition cost per customer were about $315 while average annual gross margin per customer was $255.[11] Did it make sense for E*Trade to spend so much money on customer acquisition?

If E*Trade has a 12% discount rate and 80% customer retention, its margin multiple according to Table 1 is 2.50 which projects its customer lifetime value to be $637.50, above the acquisition cost of $315. How reasonable are these assumptions? A discount rate of 12% and a customer retention rate of 80% are typical for most established companies. Given that E*Trade is a relatively new, Internet-based company, its risk and hence the discount rate is likely to be higher. Similarly, given the competitive intensity in the online brokerage industry and the existence of well-established players such as Charles Schwab and Merrill Lynch, its customer retention rate is likely to be lower than 80%. Finally, in spite of E*Trade's effort to cross-sell through its bank, its average margin per customer has not grown significantly. In other words, the lifetime value estimate of $637.50 is pretty optimistic.

Exhibit-1 provides estimates of several firms using similar assumptions. Once again we have used company annual reports and 10K statements (as of September 2000) to estimate customer acquisition costs and annual margins. This exhibit suggests that these four companies are making sensible economic decisions for customer acquisition.
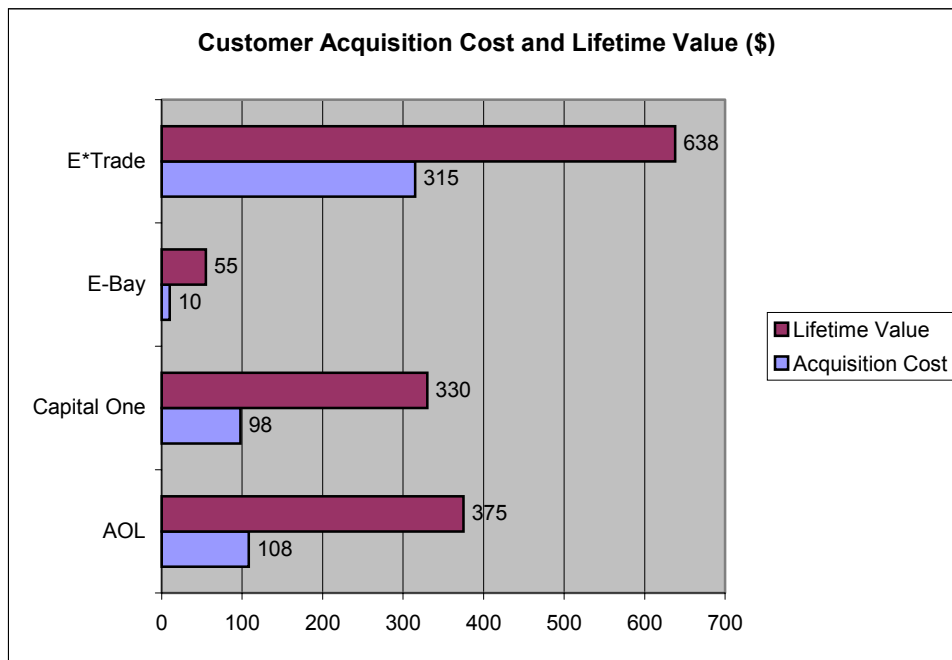
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[10] Brett Trueman, M.H. Franco Wong and Xiao-Jun Zhang (2001), "The Eyeballs Have It: Searching for the Value in Internet Stocks," *Journal of Accounting Research*.
[11] Based on annual reports and 10K statements, we estimate acquisition cost as total marketing expenditure in a period (e.g., a quarter) divided by the number of new customers in that period. Similarly annual gross margin per customer is estimated as total gross margin divided by the number of total customers. Admittedly these are rough estimates.

Unfortunately this is not always the case as illustrated by CDNow (see case-1: **Customers Now, Profits When?**).

Insert Case-1 **Customers Now, Profits When?**

Exhibit-1

Customer Acquisition Cost and Lifetime Value ($)

| Company	Lifetime Value	Acquisition Cost
E*Trade	638	315
E-Bay	55	10
Capital One	330	98
AOL	375	108

Choosing the Right Customer

Until a few years ago, and in many cases even now, many credit card companies evaluate a customer based on his/her credit-worthiness. The idea is simple and intuitive – a good customer should be able to repay his/her credit card bill so that the company minimizes its risk of bad debts. However this one-dimensional focus misses an important point. One of the most lucrative parts of credit card business is the interest charged to customers who carry a balance. Therefore customers who pay their bills in full every month, and hence the best customers on the credit-worthiness dimension, may not be as profitable as customers who carry a balance. This is not very different from balancing the risk and return in forming an optimal financial portfolio. In their zeal to minimize risk, many credit card companies may be missing a good opportunity. This realization is

not lost on Cash America that runs the largest "pawn shop" operation and is growing rapidly with 479 locations in 18 states in the US and two foreign countries[12].

Customer Retention

Let us revisit E*Trade. As indicated earlier, with an annual margin of $255 per customer E*Trade's customer lifetime value is about $638 with an 80% retention rate. However it is instructive to note how retention rate affects lifetime value. Exhibit-2 shows that if margins remain constant over time and E*Trade's customer retention rate is 60%, its customer lifetime value drops to $293, which does not cover its acquisition cost of $315. However, if E*Trade could increase its customer retention from 80% to 90%, its customer lifetime value jumps from $638 to $1,043, or 63%. The impact of 10% change in retention rate is even higher if margin grows over time. For example, if margin grows at 8% every year, then an increase in retention rate from 80% to 90% increases E*Trade's customer lifetime value by 95%.

Exhibit-2

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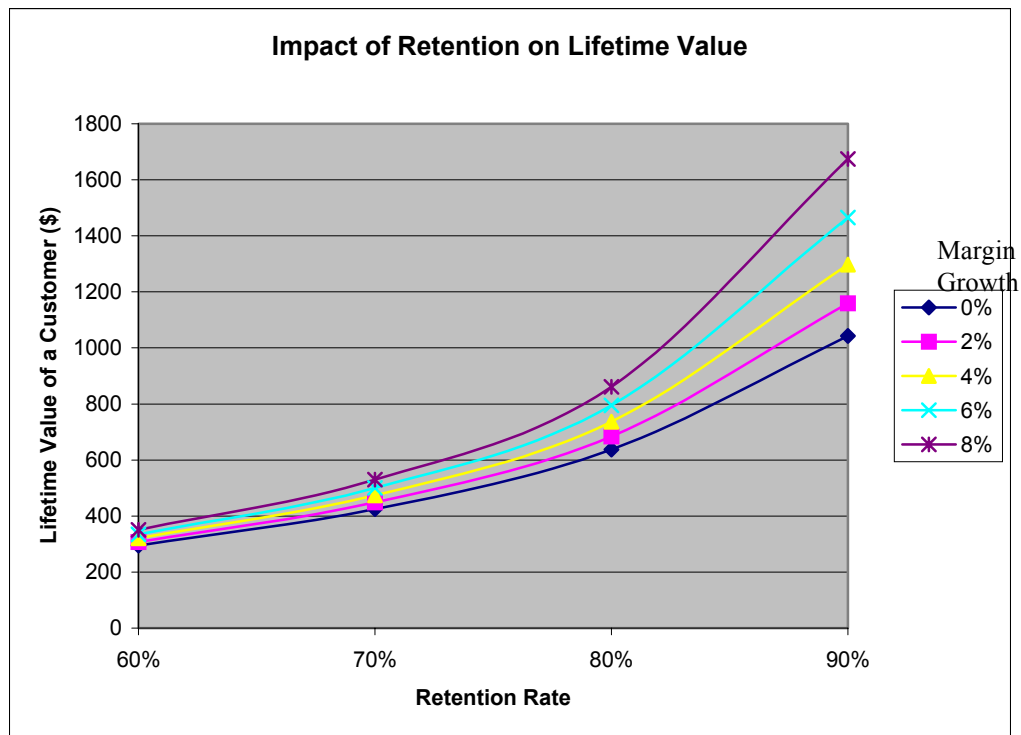
[12] Source: www.cashamerica.com

This analysis has two important implications. First, it highlights the importance of customer retention. Many firms actively pursue and measure their success on the basis of customer acquisition. However, customer retention is extremely critical for firm's profitability. Second, the lifetime value framework provides concrete guidelines on how much a company should be willing to spend to improve its customer retention, customer satisfaction or customer relationship programs. For example, E*Trade can afford to spend a maximum of $1043 - $638 = $405 per customer to increase its retention rate from 80% to 90%. It is interesting to note that this amount is more than what the company currently spends on customer acquisition. In general the cost of retention is far lower than cost of acquisition. In other words, it is very likely that E*Trade would have to spend far less than $405, which would make its retention programs very profitable.

Firing the Customer

It is not uncommon for firms to use revenue growth as a key measure of success. Yet this growth may come at a significant cost. Importantly, the cost to generate revenue and growth varies dramatically across customers. One cross-sectional study of U.S. banks found that in early 1990s only 30% of a typical bank's customers were profitable over the long run[13]. In other words, 70% of the customers destroy value! Several insurance companies found themselves in a similar situation a few years ago when they realized, after several natural disasters in Florida, that in their zeal to grow and add more customers they have acquired a large number of customers in disaster prone areas. For the long run profitability of these companies it is imperative for them to either convert unprofitable customers to a profitable status or "fire" them. This argument runs counter to the intuition of many managers who have been trained to think that adding customers, increasing sales and gaining market share are good per se. The LV perspective suggests that market share and revenue growth may be the wrong metrics to gauge success.

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[13] Peter Carroll and Sanford Rose (1993), "Revisiting Customer Retention," *Journal of Retail Banking*, vol XV, no. 1 (Spring), 7-13.

Serving Customers

One of the memorable lines in the book Animal Farm is "all animals are created equal but some are more equal than others." This basic idea holds for customers as well, i.e., all customers are important but some are more important than others. Therefore, it is not optimal for a firm to raise its customer service level across the board. Instead companies should provide a differentiated level of service depending on the LV of customers. The idea of service discrimination is not very different from the concept of price discrimination that we typically see in many industries such as airlines. However, service discrimination would not be effective without understanding long-term profitability customer by customer. Several companies are already beginning to implement such a strategy. For example, the best clients of Charles Schwab never wait longer than 15 seconds to get a call answered, while other customers may wait for as long as 10 minutes.[14] Although such service discrimination can generate a backlash from customers, it is also possible that customers will accept the old adage that "you get what you pay for", especially if the policy is clear and transparent.

Value-Based Segmentation

Discriminating customers based on their LV is not limited to the service they get. In fact differences in customers' LV provide a new and interesting way to segment customers. With the increasing availability of customer-based information as well as sophisticated software, firms can rank their customers based on their long-term profitability. In this world, segmentation and one-to-one marketing is no longer based on demographics or customer preferences alone, but is complemented with assessment of customer profitability. As one example, Fidelity classifies its customers into segments based on their profitability to the firm.

Assessing Effectiveness of Marketing Programs

Many firms spend an enormous amount of money on marketing. In 1999, General Motors spent $4 billion in advertising in US alone (US revenue = $130 billion).

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[14] Business Week, October 23, 2000.

Even a technology company such as IBM with 1999 US revenue of $37 billion spent over a $1 billion in advertising in US.[15] It is not surprising that with such large budgets managers are facing an increasing pressure to show the return on marketing expenditures. Although there has been some progress in building metrics and models to assess the ROI on marketing dollars, even the most sophisticated and state-of-the-art models largely focus on short-term returns. The concept of LV inherently looks at the long term and is therefore ideally suited as a metric for assessing marketing effectiveness, particularly when marketing dollars are thought of as investment rather than as an expense.

Consider banner advertising on the Internet that has generated an interesting debate. Supporters of banner ads argue that they provide a cheap and cost-effective way to reach a targeted group of people. Critics, on the other hand, point to dismal click-through and conversion rates of banner ads. This debate is best illustrated by a simple example. Consider a manager's dilemma of choosing between an online banner ad and an offline marketing campaign such as direct mail. In order to evaluate these two options the manager finds that the cost of reaching a thousand (CPM) consumers is only about $5 on the Internet while it is $200 for direct mail. Therefore cost favors online advertising. However, the response rate for direct mail is about 1% while conversion rates for banner ads are much worse. Some studies suggest that only 1 in 200 consumers click on a banner ad and of those who click only 1 in 100 actually buy something.[16] How should this manager decide between these two options?

One way to assess these programs would be along the following lines. Suppose both programs are designed to reach 2 million consumers. To reach these consumers, the online program would cost only $10,000 while direct mail would cost $400,000. However, due to its relatively high conversion rate of 1%, direct mail would generate 20,000 customers while online ads would get only 100 customers. This means that the effective acquisition cost per customer would be $100 for the banner ads and only $20 for direct mail. If the annual margin from a typical buyer were $60, then the manager might conclude that banner ads are not profitable and should be abandoned.

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[15] Source: www.adage.com
[16] *The Economist*, February 24, 2001

Table-2

Evaluating Marketing Effectiveness

	Banner Ads	**Direct Mail**
Cost Per Thousand	$5	$200
Response Rate	0.005%	1%
Acquisition Cost	$100	$20
Retention Rate	90%	60%
Lifetime Value	$245	$69

However, this evaluation process misses two important aspects. First, it focuses on the short term. Second, it ignores the fact that the retention rate from the two mediums may be very different. To see this, suppose in our example we also know that customer retention rate from the Internet is 90% compared to only 60% from direct mail. Higher retention rate for the Internet may be due to high targetability of banner ads. Using 12% discount rate and Table-1, we see that these retention rates imply customer lifetime value of about $245 for banner ads and only $69 for direct mail (Table-2). Therefore, in our example, even with their high customer acquisition cost, banner ads are more profitable in the long run than direct mail.

Strategic Alliances

A common growth strategy for many firms is to form alliances with other companies. For example, two months before going public, Drkoop.com paid Disney's Go network about $58 million over three years to become the exclusive provider of health content to its related web sites. A month after, Drkoop.com announced an even more dramatic deal with AOL, when it agreed to pay AOL $89 million over four years in exchange for a role as a premier provider of AOL's health care content. Clearly, Drkoop's aim was to quickly build a customer base by gaining access to the large number of customers of Go and AOL. However, these alliances beg an important question – did Drkoop pay too much? In hindsight it is perhaps easy to answer this question since we all know the fate of Drkoop.com. However, how should a company evaluate the economics of these alliances? We can learn about this from another case, that of the flower company Gerald Stevens.

Founded in 1998, Gerald Stevens was determined to build a powerful presence on the Internet. To this end it made deals with Lycos, CNN.com and Yahoo, in addition to starting its own web site. Yet the company declined a deal with AOL because AOL wanted $75 for each of its customers. Was it a good decision?

The company estimated that, on average, internet customers would buy three times over 2 years which places their lifetime value at $60 – short of the $75 acquisition cost through AOL. In contrast, it estimated that the average retail or brick store customer buys 4 times per year. The company estimated the acquisition cost of a retail customer to be about $50 with its lifetime value in hundreds. In other words, the customer economics favored a brick strategy over a click deal.[17]

Linking Customer Value to Firm Value and Financial Decisions

Mergers and Acquisitions

Mergers and acquisitions, or M&As, are common in almost all industries. While the investment banking community specializes in evaluating M&As, the lifetime value framework can also be used to provide insights about these strategic decisions. In our case study of CDNow (see case-1: **Customers Now, Profits When?**) we already discussed if it was reasonable for Bertlesmann to pay $117 million to acquire CDNow – a company with lot of customers but with negative earnings. Recently, AT&T has attracted considerable attention for its broadband business. A few years ago AT&T paid $110 billion dollars to acquire Media One and TCI. Recently it got a substantially lower offer for its broadband business from Comcast. Did AT&T pay too much or is Comcast offer too low? To understand how customer lifetime value can shed light on AT&T' strategy, see case-2 **AT&T Broadband**.

Insert case-2 **AT&T Broadband**

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[17] *The Industry Standard*, August 9, 1999.

Insights for Investors, Shareholders and CEOs

In 1999 and part of 2000, many dot-coms had what now seems to be absurd valuations. Although many factors played a role in the "irrational exuberance" of investors, one key factor was the inability of Wall Street to use traditional financial methods to value these "new economy" firms. For example, it is hard to use a price-earnings or P/E ratio for a company that has no E! Similarly trusted methods such as discounted cash flow (DCF) could not be used for companies with no or negative cash flow. Consequently many new and arbitrary metrics (e.g., market cap per page view, revenue per employee) appeared. Could we have done better? Although things always look easier in hindsight, we agree with the SEC's task force that lifetime value of customers provide useful guidelines to investors.

The premise of customer-based valuation is simple – if the long-term value of a customer can be estimated by the lifetime value framework, and we can forecast the growth in number of customers, then it is easy to value the current and future customer base of a company.[18] To the extent that this customer base forms a large part of a company's overall value, it can provide useful insights to investors. We used this approach along with published information from annual reports and other financial statements of several firms to estimate the value of their customer base. Exhibit-3 presents the results for Amazon and E*trade. Since we do not have the customer retention rate for these companies, we estimate the value of their customer base under three different scenarios.[19]

As of July 25, 2001 market cap for Amazon and E*Trade were $4.14 billion and $2.06 billion respectively. Although we do not expect customer value to be identical to market cap because it does not incorporate many factors (e.g., fixed costs, cash on hand, debt etc.), nonetheless it provides interesting guidelines. For example, Amazon's market value is significantly above our estimates of customer value, suggesting that the market expects Amazon to grow margins, increase customer retention and/or cut acquisition

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[18] Note that in the initial stages a company may be spending a lot of money on customer acquisition that would make its cash flow negative and hence traditional DCF methods inappropriate. However, in these situations the lifetime value can still be positive.

[19] Customer Value is based on data available up to March 2001. Details of this approach can be found in Sunil Gupta, Donald Lehmann and Jennifer Stuart (2001), "Valuing Customers," *Working Paper,* Columbia University.

costs. In contrast, E*Trade's market value is below its customer value, indicating an expectation of slowing online trading and margin squeeze.

Exhibit-3

Value of Customers
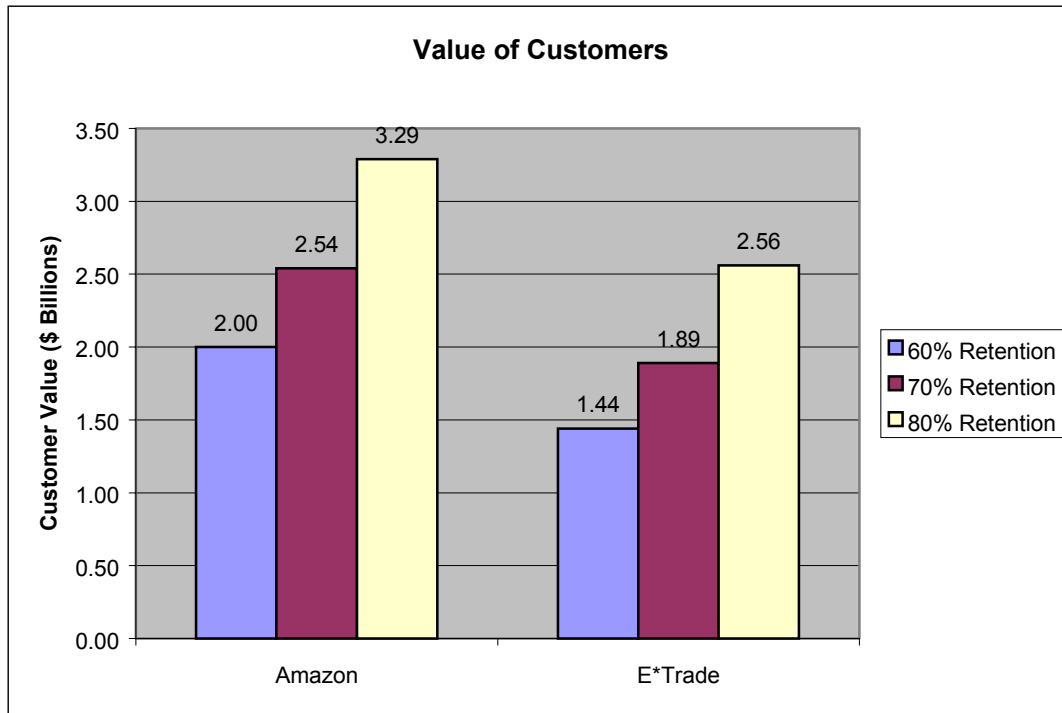
Summary

Customer lifetime value is more than a metric; it is way of thinking, a way of doing business. It encourages managers and employees to focus on the long term rather than the short term, externally rather than internally. This shifts the mindset from products to customers and from a transaction orientation to a long-term relationship orientation. Perhaps the easiest way to improve customer service and customer retention is to simply inform employees that a typical customer is worth, say, $1,000. Even if each transaction of this customer is for only $5, treating the customer poorly generally means saying goodbye to $1,000 of long run profit. And not only do dissatisfied customers not call and inform you that they are switching, their bad word of mouth has a strong negative effect on other customers as well.

Of course, customers are not born with a fixed lifetime value. The key factors that affect lifetime value are acquisition cost, gross margins and retention rates. These in turn are influenced by a host of other factors such as service level, product quality etc. It is critical to understand which factors have the highest leverage under different situations and what are the economics of improving those factors.

In sum, customers are critical assets of a firm and their value should be measured and managed. Customer lifetime value is a fundamental and quantitative measure of the financial consequences of the relationship a firm has with its customers. It provides a useful metric for judging both firm actions and financial market valuations. It also focuses attention on customers (and their acquisition, expansion and retention) rather than products, in effect institutionalizing an external orientation. Given the increased availability of data at the individual customer level, lifetime value seems destined to play a major role in marketing and corporate strategy in the future.

Customers Now, Profits When?

Customer Acquisition at CDNow

In August 1994, Jason and Matthew Olim launched CDNow in the basement of their parents' house in Ambler, Pennsylvania. Within a year, revenues reached $2 million. Like most web-based startup companies, CDNow focused heavily on acquiring new customers. Its customer acquisition strategy used many traditional instruments such as television, radio and print advertising as well as some innovative programs. For example, in 1997 CDNow introduced Cosmic Credit; the Internet's first affiliate program where thousands of affiliate members effectively became commissioned sales force for the company. The same year CDNow agreed to pay $4.5 million to a large portal to become its exclusive online music retailer. In 1998, CDNow decided to merge with rival N2K which doubled its customer base from 980,000 customers to more than 1.7 million. These efforts were successful in dramatically increasing CDNow's customer base to more than 3 million customers within 5 years (see chart below). The company was so successful in generating traffic on its web site that in its advertisements, as well as its reports to financial analysts, it regularly highlighted facts such as number of new customers, number of page views and number of unique visitors.

It is easy to appreciate CDNow's emphasis on customer acquisition; a startup has to acquire new customers to become a viable business. To its credit, CDNow carefully allocated its marketing budget across different customer acquisition programs based on their cost effectiveness.[20] Heavy emphasis on customer acquisition was also driven by Wall Street. Several research studies show that without the benefit of traditional financial measures such as P/E ratios (which didn't exist for many Internet companies with negative earnings), during 1998-99 financial markets started rewarding companies with strong nonfinancial measures such as number of customers.[21]

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[20] See Donna L. Hoffman and Thomas P. Novak (2000), "How to Acquire Customers on the Web," *Harvard Business Review*, May-June, 179-188.
[21] Brett Trueman, M.H. Franco Wong and Xiao-Jun Zhang (2001), "The Eyeballs Have It: Searching for the Value in Internet Stocks," *Review of Accounting Studies*, forthcoming.

Number of CDNow Customers
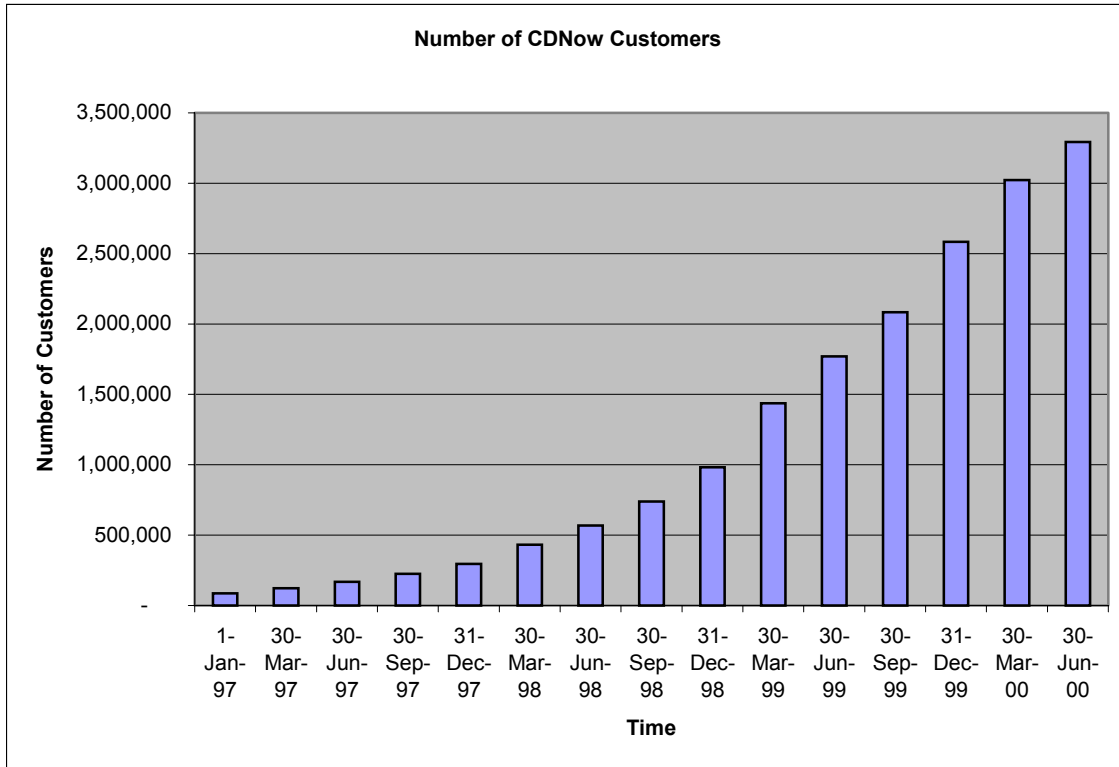
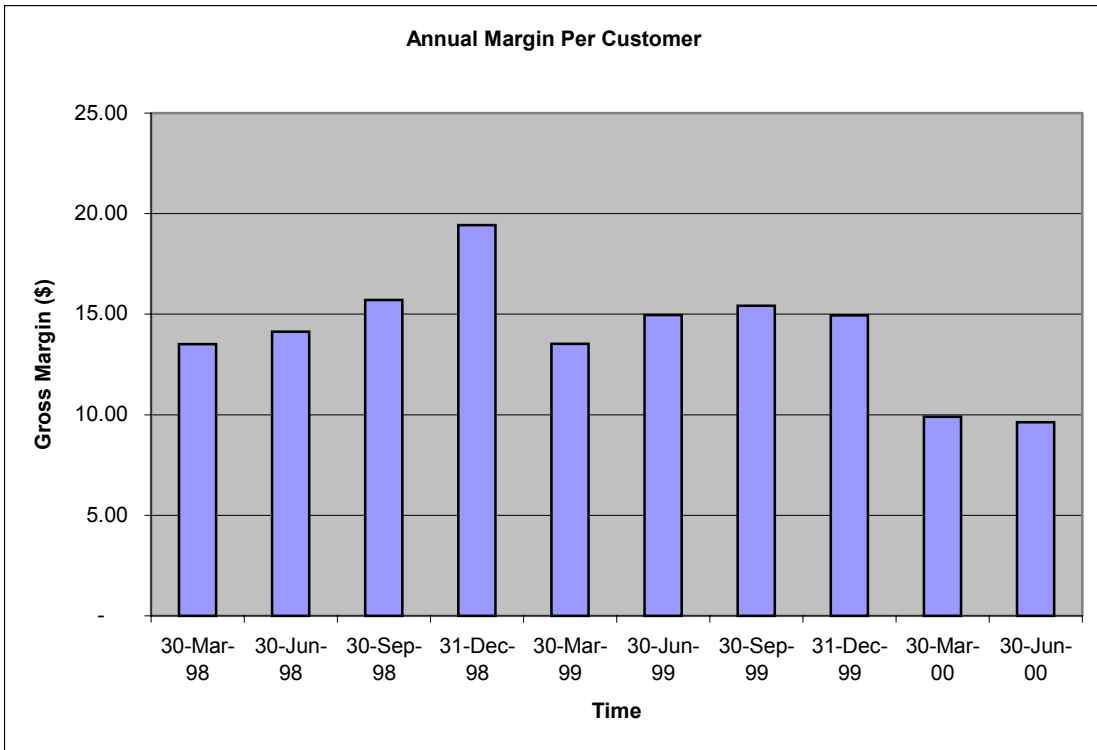Source: Company Annual Reports and 10Q Filings

Was the emphasis on customer acquisition by both CDNow and Wall Street misplaced? While it is easy to rationalize things in hindsight, we believe that the concept of customer lifetime value provides the answer. For CDNow's customer acquisition strategies to make economic sense, the lifetime value of its customers should be significantly more than their acquisition cost. Based on company reports, we estimate that during 1998-2000, average customer acquisition cost for CDNow ranged from $30-55 (see chart below).[22]

During this same time, annual gross margin per customer did not change significantly from an average of $10-20. If anything, there were signs of margin erosion during early 1999 (soon after the acquisition of N2K) and during March-June 2000 (when the company cut its overall marketing partly due to lack of resources).

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[22] To estimate acquisition cost per customer, we simply divided the total marketing cost during a period by the new customers acquired during that period.
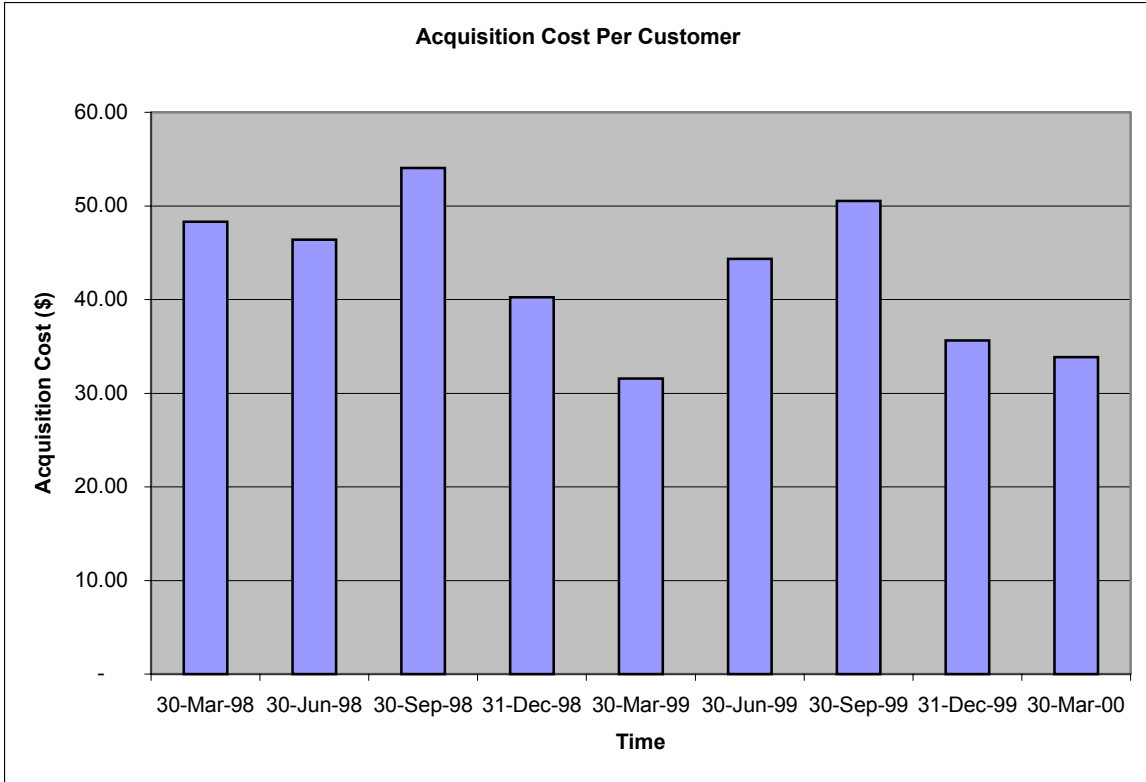
Acquisition Cost Per Customer

Source: Company Annual Reports and 10Q Filings

Annual Margin Per Customer

Source: Company Annual Reports and 10Q Filings

In addition, during this period, CDNow reported an average customer retention rate in the range of 51-68%. Increased competition and the nature of the Internet (where shopping at a competitor is a mouse click away), makes it very hard for companies to maintain high customer retention. Some research studies show that while an increasing number of new visitors are coming to web sites over time, there is significant slowdown in the visit behavior of past users.[23]

Our estimates of acquisition cost ($30-55), annual margin ($10-20) and retention rate (51-68%) enable us to evaluate the economics of CDNow's customer acquisition programs. Assuming a favorable discount rate of 12% and a higher than typical retention rate of 70%, we see from Table 1 that the lifetime value of a CDNow customer is 1.67 times its annual margin, or $16.70-33.40; barely covering its acquisition cost. Therefore only for the most favorable margin and retention rate and the lowest estimate of acquisition costs are the economics profitable, and then just barely so.

Partly due to its expensive customer acquisition strategy, CDNow reported a loss of over $100 million at the end of 1999. In early 2000, the company had merger talks with Columbia House which did not materialize. In March 2000, soon after the collapse of this deal, CDNow publicly announced that it had only enough cash to sustain another six months of operations. At this point in time, the German media giant Bertelsmann decided to enter into negotiations to acquire CDNow. How much should Bertelsmann pay to acquire CDNow? While company acquisitions involve many complex issues, a quick and reasonable estimate for the firm value can be based on the value of its customer base. This is especially true in the case of companies like CDNow who do not have substantial physical assets and where customers are the major assets of the company.

In June 2000, CDNow had 3.29 million customers. Given high customer acquisition cost compared to customer lifetime value, most of the firm value is already captured in the current rather than the future customer base. With an average annual margin of $15 (range of $10-20) and a customer retention rate of about 70%, the value of

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[23] Wendy W. Moe and Peter S. Fader (2000), "Capturing Evolving Visit Behavior in Clickstream Data," *Working Paper*, Wharton School, University of Pennsylvania.

the current base was $82.4 million.[24] If Bertelsmann believes that due to its powerful position in the industry, better management and appropriate infusion of money it could improve customer retention to 80%, the value of CDNow's customer base was about $123 million.

The next month, in July 2000, Bertelsmann bought CDNow for $117 million in an all cash deal.

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[24] Lifetime value of a customer with 70% retention rate is 1.67 times the margin (see Table 1), i.e., $15*1.67=$25.05. Therefore the value of 3.29 m customers is 3.29*$25.05=$82.4m.

AT&T Broadband

AT&T and its broadband strategy has attracted a lot of attention for the last two years – first when it paid $110 billion dollars to acquire TCI and Media One, then for its decision to break up AT&T Broadband as a separate entity, and more recently when Comcast made a bid for its broadband business. While the broadband industry is fairly complex with changing technology, evolving consumer trends and multitude of mergers and alliances, it is enlightening to briefly trace AT&T's broadband strategy and see that customer value plays a significant role in understanding this complex issue.

The Strategy

In recent years the U.S. cable industry has been going through consolidation. Only three years ago, the top three cable companies in the US controlled 49% of the subscribers. If the recent bid by Comcast to acquire AT&T's cable business succeeds, that figure will rise to 65%. In 1999 alone, 93 deals covering 29% of all cable subscribers were announced or completed in this industry.[25] AT&T has contributed to consolidation in this industry by acquiring Telecommunications Inc (TCI) and Media One for $110 billion.

Industry experts and company executives state several reasons for this rush to consolidate. First, combining geographically fragmented markets into a national cable network helps achieve efficiency in infrastructure as well as marketing costs. Second, it improves bargaining power in negotiations with content providers such as HBO. Third, and perhaps most importantly, it puts the winners in a strategically enviable position in the battle for the "last mile" to consumers' homes to potentially beam voice, data, video on demand, interactive TV and a host of other applications.

In addition to these strategic reasons for the industry as a whole, AT&T had even greater urgency to embrace cable and broadband. New regulations opened the local and long distance phone business to more competition. AT&T decided to grab a piece of the local phone business and cable telephony became a priority for it. At the same time local

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[25] *The Economist*, "Loop Dreams," July 14, 2001.

Bell companies encroached upon AT&T's long distance business. Consequently long distance, which historically has been a cash cow for AT&T, started losing ground. In the most recent quarter, AT&T's revenues from long distance fell by 23.7% over the comparable period last year. Michael Armstrong, AT&T's CEO, anticipated this almost two years ago when he indicated that long distance is expected to make up only 13% of AT&T's revenue by 2004, down from 42% in 1998. This further intensified AT&T's urge to grow in other areas such as wireless and cable.

The Economics

Industry reports as well as financial analysts suggest that a key motivation for AT&T's acquisition of Media One and TCI was to gain access to 16.4m subscribers and the 28m houses passed by their system. In effect, AT&T spent $4,200 to acquire each cable household.[26] While acquiring these cable companies and securing access to several million households was consistent with AT&T's strategy, a critical question remains -- did AT&T pay too much?

In order to address this question, we again use the concept of customer lifetime value. For AT&T's decision to be economically meaningful, the lifetime value of its customers must be greater than their acquisition cost. However, we need to recognize that by spending $4,200 per customer, AT&T acquired both intangible assets (i.e. customers) as well as tangible assets (i.e. infrastructure such as cable lines). Some studies estimate that for a company building a new network the infrastructure cost per home passed would be approximately $1,000.[27] However, AT&T had to spend heavily to repair antiquated TCI systems as well as update the existing infrastructure to make it compatible for future applications such as voice and data. For example a study by Morgan Stanley estimates that each phone subscriber added to a cable network (to allow cable telephony) would cost about $1,210. In sum, the value of existing infrastructure and the cost of updating it are about the same. Therefore it is reasonable to use the full $4,200 as the cost of acquiring a customer.

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[26] *The Economist*, Dec 11, 1999.
[27] "Broadband 2001: A Comprehensive Analysis of Demand, Supply, Economics, and Industry Dynamics in the U.S. Broadband Market," by J.P. Morgan and McKinsey & Company, April 2, 2001, New York.

Assuming a very optimistic margin multiple of 4 (which assumes 12% cost of capital and over 90% retention rate), this translates into annual profit per customer of $1,050 for break even. Is it possible for AT&T to achieve this goal?

Let us consider where the company plans to generate revenue and profit from each customer. There are two immediate sources of revenue – cable subscription ($50-60 per month) and high speed Internet access ($40 per month). Although household penetration for these services, especially Internet access, is likely to increase over time; prices and revenues from these two services are not likely to grow substantially due to increased competition from satellites and DSL. Additional sources of revenue include such applications as cable telephony, video on demand, interactive games etc. Although it is hard to put a precise revenue estimate for these services, we optimistically estimate them to be $100 per month. Therefore in an optimistic scenario the total revenue per customer would be about $200 per month or $2,400 per year. In order to generate $1,050 in profits to recoup acquisition cost, this requires a profit margin of 43.75%.

The Reality

At first blush, the economics seem achievable since most firms in the cable industry have a profit margin of 30-45%. However, for AT&T this scenario is very optimistic for many reasons. First, we used a very optimistic retention rate of 90%. Industry estimates suggest a monthly churn rate of 1.7% in 2001 and 2.2% by 2005. This translates into an annual retention rate of 81.4% in 2001 and 76.6% in 2005. Second, by assuming a revenue of $200 per month per customer, we implicitly assumed that all TCI and Media One cable customers will immediately start using multiple services including cable, Internet access, video on demand, cable telephony etc. This is clearly an extremely optimistic and unrealistic assumption. For example, high speed Internet access currently reaches 25-35% of online users and is expected to reach 57% of online users by 2005. Similarly, by the end of 2001 only 1.3 million customers are expected to receive phone service over cable lines. Third, in our estimates we used many sources of revenue such as telephone, Internet access and video on demand. This notion of convergence and cross

selling is one of the main factors driving the consolidation in the broadband industry. However, it has been difficult for most companies to translate this vision into reality. AT&T's decision to break down the company into four distinct businesses (wireless, broadband, consumer and business) is an indication of this reality. Fourth, even with the most optimistic assumptions, AT&T barely recovers its acquisition cost of $4,200 per customer. Finally, AT&T's current profit margin are around 20%, a far cry from the 44% margin it needs to break even.

By now most industry reports indicate that AT&T overpaid for its acquisition of TCI and Media One. Valued on a per-subscriber basis, some analysts believe that AT&T would fetch between $53 billion to $58 billion. On July 8, 2001 Comcast offered $58 billion, including $13.5 billion in assumed debt, to acquire AT&T's broadband business. About a week later AT&T rejected this offer. Is Comcast under valuing AT&T's broadband business or is AT&T reluctant to admit that it overpaid?