

Customers are individuals and want to be treated as such—
which makes the profitability of each hard to predict.

Hedging Customers

by Ravi Dhar and Rashi Glazer



Tend to them as solicitously as you wish,
but you can manage customers better-
and make their collective behavior less difficult to anticipate and plan for-
if you think of them as you would stocks in a portfolio.



YOU ARE THE DIRECTOR OF MARKETING for a major financial-services company with a budget of \$5 million to invest in customer acquisition and retention. Which customers should you acquire, and which should you retain?

In order to determine which customers will be the most profitable, a business first must consider the revenue they have been generating and how much they will cost to acquire and take care of. But its analysis cannot stop there. The company wants these customers to stay around a while, since repeat purchases by established customers usually require less marketing effort—as much as 90% less, according to some estimates—than do initial purchases by new customers. So it will have to decide which customers to acquire and which to retain on the basis of the cash flows they are likely to generate well into the future.

However, businesses are aware that past performance, while useful in making predictions, can be very misleading. The size and frequency of some customers' expenditures have never been consistent, perhaps because their available cash fluctuated in tandem with an external factor like interest rates or because they favored a competitor's cheaper product whenever one came along. Up to a point, the choice is obvious: Keep the consistent big spenders and lose the erratic small spenders. But what about the erratic big spenders and the consistent small

spenders? It's often unclear whether they should be acquired or retained, and at what cost.

Lacking crystal balls, businesses have begun dealing with the problem of unpredictable customer behavior by following the practices of sophisticated investors in stocks, whose prices, as everyone knows, also fluctuate in unforeseeable ways. No matter how much confidence they may have in their research, such investors generally own portfolios comprising dozens of stocks with different, indeed divergent, histories and prospects. Each portfolio is diversified so as to produce the investor's desired returns at the particular level of uncertainty he or she can tolerate.

As the fundamental source of a business's cash flows, customers, too, are assets—risky assets. As with stocks, the cost of acquiring (or retaining) them is supposed to reflect the value of the cash flows they are likely to generate down the line. Some have a history of generating bigger cash flows than others; some a history of steadier cash flows. Because the bigger generators of cash often prove to be unsteady, it helps to have some steady customers around, even if they have a history of being less profitable. That is, it helps to hedge. So the question of who your new customers should be turns, at least in part, on who your customers already are. And who your present customers are should play a role in determining what

fraction of that \$5 million you are prepared to pay for the ones you want to add. In short, the value of customers you are considering acquiring (or retaining) depends on the effect they will have on the riskiness as well as the profitability of the customer group they may join. The particular combination of customers you arrive at will determine how closely your business approaches what would be for it the optimal relationship between risk and reward.

The Cost of Risk

At least since the advent of customer relationship management, businesses have been applying themselves to the question of individual customers' long-term or even lifetime value (LTV). A carmaker, for example, might want to develop a series of vehicles corresponding to every stage of adulthood. A health care provider might want to market its services as cradle to grave. But whatever the contemplated duration of the relationship, very few companies factor risk into their calculations of LTV.

Companies typically calculate the LTV of a customer or customer segment by taking its expected cash flows or returns over a number of future periods and computing the present value of that cash by applying an appropriate discount factor or required rate of return. Several firms that we have met with also employ the concept of *recency*, *frequency*, and *(average) monetary value* (RFM) in computing LTV. According to the RFM calculation, customers that have made a certain number of relatively large purchases in the current or previous period are more likely to stay valuable than customers that made only a few small purchases at wide intervals some time ago.

One objection to RFM is that it ignores the costs of acquiring, servicing, and retaining customers. While costs are perhaps less variable than revenues, since they are more firmly under the control of the business, the interaction of the two produces cash flows that can be quite uncertain over time.

An equally serious objection to RFM is that it does not take into account how the volatility of a customer's past purchasing behavior might affect the customer's patterns

of consumption in the future, or how selectively the patterns of various customers can be affected by market or macroeconomic forces.

Risk-Adjusted Customer Portfolios

But even if a company recognizes and addresses those issues, it cannot really begin to control for risk unless it also projects the collective impact on its total cash flows of the behavior of its particular combination of customers. Not many companies do that. Beguiled perhaps by their newfound capacity to uncover microscopic details about individual customers' backgrounds and tastes, few have bothered to consider whether all their individually desirable customers are, from the standpoint of risk, desirable collectively. Since a customer's value changes to reflect both the identity of the customer group it is joining and the anticipated effect on that group's

predictability, it is important to make a calculation that reflects those factors. We refer to this as the *risk-adjusted lifetime value* (RALTV). Using RALTV to select every customer transforms the customer base into a customer portfolio. (For our method of estimating RALTV, see the sidebar "Quantifying a Lifetime of Risk-Adjusted Value.")

RALTV notes a customer's expected return in each period and the degree of those returns' deviation from the customer's mean return. (In some instances, an assessment of the market and macroeconomic forces at work

will supplement the information about pattern deviation.) But the combined effect of the size and fluctuations of a given asset's returns is not the prime measure of the asset's riskiness when the asset is one element of a portfolio. The prime measure of a customer's riskiness is the contribution the customer makes to the volatility and therefore the predictability of the entire portfolio.

Thus before a firm decides whether to acquire a customer or for how much money, it must determine whether the addition of the customer will have the desired effect on the portfolio's profitability and riskiness. As it happens, the less a customer's behavior promises to be like that of the portfolio, the stronger its contribution to the portfolio's stability and predictability; the closer its behavior to the portfolio's, the weaker its contribution. So if the portfolio is already riskier than the managers would like it to be, adding a volatile customer that has a reasonable chance of displaying an offsetting pattern of purchases and costs would be the conservative course to take.

Anatomy of Desirability

The desirability of a potential customer or customer segment depends on five factors:

- the required rate of return on investment in customer acquisition or retention;
- the anticipated returns of the individual customers under consideration;
- the correlation of the anticipated returns of those customers and the anticipated returns of the existing portfolio;
- the riskiness of those customers; and
- the effect those customers are likely to have on the riskiness of the portfolio.

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Management thus becomes a task not only of matching products and customers but of matching customers and customers - that is, it becomes a task of adding and culling them to produce a desired rate of profit over a specified period of time without exceeding the firm's tolerance for risk. In a company managed in this fashion, no decision on how to treat a given segment or customer - in particular, what level of resources to devote to its acquisition, servicing, or retention - is ever made independently of other such decisions or without regard for their collective impact on the firm's prospects for meeting its profit targets.

Desirable Customers

In demanding the minutest attention to every customer's slightest tremor while promoting the broadest awareness of entire markets' transformations, the customer-portfolio approach brings together the opposite poles of marketing methodology. But it also brings together the worlds of

marketing and finance - that is, the practices of customer relationship management and traditional capital budgeting. Our core idea is that the firm can maximize the returns of its overall customer portfolio by acquiring or retaining particular customers or segments on the basis of how their spending and cost patterns are likely to contribute to the diversification of the overall portfolio's cash flows. A base of customers selected for their risk-adjusted lifetime values should generate higher returns for a given level of risk than one assembled without regard to the risk profile presented by its various constituents and their effect on the resulting portfolio.

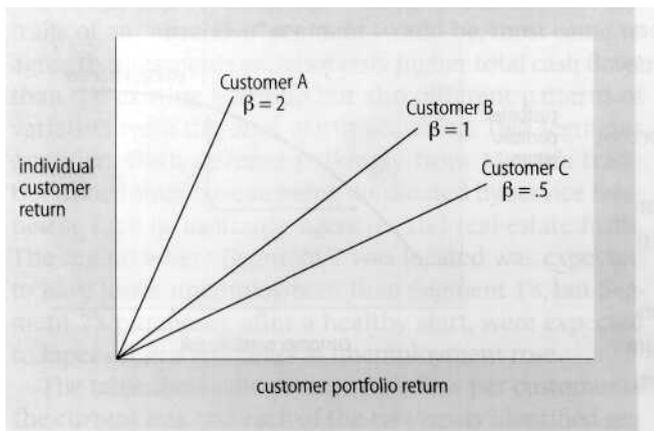
The first principle of diversification is that it is usually better to have more customers than fewer. Of course, a firm *always* prefers to have the greatest number of customers it can gather, particularly if they are all profitable. But a large customer base has an advantage beyond market share: The cash flows generated by a portfolio of risky customers are almost always more stable than the cash flows of any of them individually.

Quantifying a Lifetime of Risk-Adjusted Value

The procedure for selecting a customer portfolio that will achieve a particular risk-return objective - we call it the CusPort method, for "customer portfolio" - involves four steps:

Beta and Customer Returns

The slopes of the three lines express the relationships between the individual customer's and the overall portfolio's returns once the customer has been added. For example, if the portfolio is expected to return \$10 per capita, then a customer with a beta of 2 is expected to return \$20.



1. Calculate a customer's risk-adjusted lifetime value (RALTV). This involves
 - estimating the cash flows from the customer over the relevant time horizon;
 - specifying the required rate of return, or RRR, for the customer;
 - calculating the customer beta, expressed by the formula $\beta_C = \text{covariance}(\text{cash flows from customer, cash flows from portfolio}) / \text{variance}(\text{cash flows from portfolio})$ (see the exhibit "Beta and Customer Returns");

2. Use the formula $\text{RALTV} = \sum [CF_t / (1 + \text{RRR} * \beta_C)^t]$, where CF_t is the cash flow from the customer in each time period and t is the time horizon - the number of periods. Note how this differs from the traditional formula for calculating lifetime value (LTV), which is $\sum [CF_t / (1 + \text{RRR})^t]$. The RALTV "adjusts" the traditional LTV by the factor of β_C , the beta or riskiness of the customer.

3. Specify either a desired level of risk or a desired rate of return. Note that the procedure also allows the manager to identify what we call the risk-adjusted required rate of return (RARRR) for each customer, based on its beta: $\text{RARRR} = \beta_C * R_m$, where R_m refers to the return produced by the "market," or portfolio, of customers.

4. Identify the portfolio of customers that will achieve the objective. Construct the efficient frontier, then allocate the allotted funds accordingly.

A desirable asset from a portfolio manager's perspective is not, however, simply a customer that promises a high return. To be considered desirable, the customer must promise to generate returns of a size and frequency that are different from those of the segment it would be joining or those of the rest of the portfolio. For instance, adding a low-risk customer doesn't in itself improve a portfolio's chances of achieving its desired return.

At the heart of our approach is what we call customer beta, a measure that is analogous to the beta formula for valuation of a stock. It is designed to capture the correlation of the customer's risk-return ratio to that of the overall portfolio. If a customer's returns—that is, the revenues it generates less the cost of acquiring, servicing, and retaining it—move up and down more drastically than the portfolio's, it will have a beta greater than one. If the portfolio's returns fluctuate more drastically than the customer's, the beta will be less than one. When a customer has a beta less than zero, its risk-return trade-off moves in the opposite direction of the portfolio's—that is, if the portfolio's return in a given period is positive, the customer's return can be expected to be negative. The relationship between the returns is straightforward: To find the customer's expected return, multiply the customer's beta by the return of the portfolio's average customer. Thus a customer with a beta of -2 will be expected to have a -\$20 return (that is, to lose money) in that period if the average customer in the portfolio has a return of \$10. (See the exhibit in the sidebar "Quantifying a Lifetime of Risk-Adjusted Value"). The beta model captures the uncertainty of cash-flow estimates; but if it is used to analyze a stretch of multiple periods—say, the next five years—it does not indicate whether a customer's returns will be high in periods when the portfolio's are low or low when the portfolio's are high.

A useful tool for helping managers make the trade-off between risk and return is the *customer efficient frontier*—a curve showing the maximal return for any given level

of risk or vice versa. A manager can specify either the acceptable level of risk or the desired rate of return; the efficient frontier will help identify the optimal mix of customers for achieving the objective chosen. To correct for a portfolio's current tendencies, a manager would want to add either a high-cash-flow but highly volatile customer or one offering a great deal of certainty that its past returns would continue into the future, though those returns are likely to be relatively low. Customers whose risk-return ratios hover near the median would have little effect on the risk profile of a segment or entire portfolio that a manager wanted to adjust. (See the exhibit "The Customer Efficient Frontier.")

Let's look at one instance of how a particular company identified its most beneficial customer prospects.

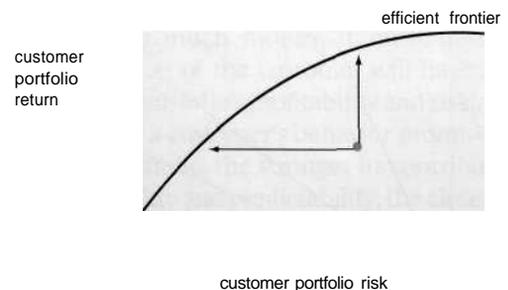
Myron Corporation and RALTV

Myron Corporation, based in Maywood, New Jersey, is a global leader in the personalized business-gift industry. Its customers are primarily small to medium-size firms, or divisions of large organizations, that give away items such as personalized calendars and pens for the purpose of courting customers and rewarding employees. The company maintains a database of its customers and subscribes to listings of potential customers, to which it sends direct-mail pieces that include samples of its standard offerings. Traditionally, Myron ranked its sales leads according to their potential LTV, then lavished its marketing budget on the highest-ranking segments until it "ran out of money."

Myron's traditional customer base consists largely of manufacturing firms in low-tech industries whose salespeople distribute Myron's products to customers. But among the customers the company recently acquired is a group of insurers. In reviewing the insurers' spending patterns, Myron noticed that they had responded to changes in economic conditions in systematic ways. For example, an increase in unemployment in the region

The Customer Efficient Frontier

The point shown in the figure represents a company's customer portfolio; the vertical component of its position corresponds to the portfolio's return, and the horizontal component corresponds to its risk level. Because the point does not lie on the efficient frontier, the portfolio's risk-return balance is not optimal—the return is less than it could be, given the level of risk the company has assumed. By adjusting its mix of customers, the firm can either produce a higher return at the same level of risk (vertical arrow) or reduce its level of risk without depressing its return (horizontal arrow). If the firm specifies the risk it can tolerate, the efficient frontier will specify the maximum return it can get. If the firm specifies the return it seeks, the efficient frontier will specify how much risk it must assume to get there.



where they did business had been associated with a surge in property and casualty claims. The claims shrank the insurers' marketing budgets, limited their purchases, and put a big dent in Myron's overall returns. The firm realized that if its new customers had come from a variety of industries and regions, their spending patterns would have been more complementary, improving the performance of Myron's entire customer portfolio.

We worked with Myron to identify the best combination of customers to be acquired. While we plan to make those selections customer by customer in a subsequent phase of our engagement, the project's current phase involves clustering potential customers into segments and deciding which segment would be the most attractive to acquire in view of its RALTV. The firm intended the new customers to constitute 30% of its portfolio and produce a 10% return on the cost of acquiring them.

Using a variety of statistical techniques such as similarity and cluster analysis, we placed individual customers in segments we had defined on the basis of such customer characteristics as industry, location, and the purpose of the gift - for example, to reward outstanding customer service-as well as historical purchase patterns. Next, with the help of Myron's managers, we estimated the cash flows of the average existing customer in each of the next five periods (years, in this case). We then estimated the cash flows of the average customer in each of the segments Myron was considering acquiring. We did this by forecasting the state of the economy over those five periods and, through scenario planning, the economy's impact on the spending of each customer segment. In this way, the firm was able to determine which segments offered some promise of improving the existing portfolio's cash flows.

Though Myron's managers hotly debated what the traits of an "attractive" segment would be, most came to agree that segments with not only higher total cash flows than the existing portfolio but also different patterns of variation were the ones worth acquiring. Two segments qualified. Both differed strikingly from Myron's traditional customer base in being dominated by service businesses such as insurance agencies and real-estate firms. The region where Segment 2 was located was expected to have lower unemployment than Segment 1's, but Segment 2's purchases, after a healthy start, were expected to taper off in a few years as unemployment rose.

The table shows the average cash flow per customer of the current mix and each of the two newly identified seg-



ments over five years. (The amounts are for comparison purposes and do not reflect Myron's actual per-customer cash flows.)

	Period 1	2	3	4	5	total
current mix	\$25	\$25	\$35	\$25	\$20	\$130
Segment 1	\$45	\$25	\$25	\$10	\$10	\$115
Segment 2	\$60	\$30	\$35	\$10	\$10	\$145

We then calculated both traditional LTV and RALTV to determine the merits of acquiring one segment or the other. (The acquisition costs of the two new segments were the same and thus irrelevant.)

	total cash flow per customer over the five-year period	beta	LTV	RALTV
current mix	\$130	1	\$81	-
Segment 1	\$115	.71	\$71	-
Segment 2	\$145	1.29	\$90	*
portfolio once Segment 1 is included	\$125.50	.91	\$78	\$83
portfolio once Segment 2 is included	\$134.50	1.09	\$84	\$77

*Under the traditional approach, LTV = RALTV, since the firm is not adjusting for risk.

Under the traditional lifetime-value approach, Segment 2 emerges as the one to acquire, since it shows

higher cash flows than Segment 1 in each period. But the RALTV calculation points to Segment 1, since the variance in its pattern of cash flows is negatively correlated with that of the original customer mix. To address this discrepancy, we located a new segment, Segment 3, which seemed to offer a cumulative return close to Segment 2's in the form of a pattern of cash flows that differed markedly, and therefore desirably, from the pattern of the original mix. While it too was heavily weighted with service firms, it had a higher proportion of medical and dental offices concentrated in regions whose economic prospects also differed.

	Period 1	2	3	4	5	total
Segment 3	\$36	\$17	\$30	\$17	\$45	\$145

	total cash flow per customer over the five-year period	beta	LTV	RALTV
current mix	\$130	1	\$81	*
Segment 1	\$115	.71	\$71	»
Segments	\$145	-.58	\$90	*
portfolio once Segment 1 is included	\$125.50	.91	\$78	\$83
portfolio once Segment 3 is included	\$134.50	.53	\$84	\$114

In this case, the addition of high-risk Segment 3 to the portfolio produced a more pronounced reduction in the risk level of the portfolio than the addition of a supposedly safer segment would have done. While even the traditional LTV measure would indicate that Segment 3 was preferable to Segment 1, using RALTV reveals the full dimensions of Segment 3's effect on expected return. With the acquisition of Segment 3, Myron hopes to increase its average cash flow per customer by \$4.50 (\$134.50 - \$130), achieving an incremental gain in LTV (which is now adjusted to take into account risk) of \$33 (\$114 - \$81) while actually reducing its risk by 47% (1 - 0.53).

Impact of the New Customer Focus

Some firms have begun to grasp the problem of achieving performance goals when their ultimate source of wealth is the diverse and even arbitrary consumption patterns of a wide assortment of customers. At this preliminary stage, most that want to control for risk have done so by matching segments to negatively correlated segments. But over the past century, marketing has shifted from focusing on the masses to focusing on the individual, and customer risk management will eventually do the same. Instead of setting segments in opposition to one another on the basis of their risk-adjusted correlations, managers seeking to produce much more precise outcomes will assemble portfolios of negatively correlated individual cus-

tomers. Since customers will be prized not just for the cash flows they're likely to generate but for their contributions to a portfolio's risk-adjusted lifetime value, the pool of potential customers can only grow.

But RALTV is more than just a tool for capturing value that has been overlooked. It is also a transformer. Companies that view the customer as their fundamental source of value can be expected to change how they are run in ways that go beyond the simple calculations set out above. The first thing to change will be the way they are organized. In particular, their product managers will be replaced by "customer managers," who will serve as heads of teams of marketing specialists in product development, pricing, advertising, forecasting, and so forth. They will be charged with developing the firm's strategic objectives for a given group of customers, developing and delivering a set of offerings to the group, and assuming final responsibility for the profits or losses it produces.

At the same time, the current method of accounting for profit and loss, which is by product, will be replaced by one that determines the P&L of each customer. Once adjusted for risk, the P&L for each customer will become the firm's key performance and operational metric.

The soundness of customer valuations—and thus of valuations of companies as a whole—will depend on the quality of the information they amass about customers' identities and past behavior. Hence, companies will need to be more meticulous than ever in gathering such data. But even if this information is highly accurate, companies must have the capacity to retrieve and synthesize it. Of course, though customers are assets, firms don't really "own" them, especially the unpredictable ones. Firms own just the data and some kind of relationship with them. Moreover, neither the relationship nor the possession of the information is exclusive. Such considerations make it appropriate to think of customers as intangible assets, which in other forms have proved notoriously difficult to value.

Once a company has shifted wholeheartedly to a customer focus, it must not forget the distinction between volatility in purchase behavior due to factors beyond its control and those directly attributable to competitors' initiatives and its own lapses. The goal of customer diversification should not distract or deter the company from doing everything it can to create a better fit between its offerings and the customer's needs. After all, both risk management and market focus are integral to strategy.

Indeed, if the logical consequence of a customer focus, rather than a product focus, is a reorientation toward improving the long-term value of the company and away from the widespread and much-deplored obsession with short-term performance, strategy may yet regain its proper place among the concerns of top management.

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