Avoiding the Winner's Curse in M&A

The following discussion provides an opportunity for students to deepen their understanding of several aspects of avoiding the winner's curse. The first part of the discussion involves an analytical treatment of Concept Preview Question 10.2. The second part of the discussion involves the famous Monty Hall problem and its application to avoiding the winner's curse. The third part of the discussion contains three additional case studies that feature the winner's curse, one involving the firm Cisco Systems, a second involving the firm AT&T, and a third involving the firm 3Com.

A10.1 AVOIDING THE WINNER'S CURSE

When an acquiring firm has asymmetric information about a target firm, it means that the acquiring firm will be buying a pig in a poke. In order to capture this feature, consider an example where the target firm is worth $1 million. In this variation, the target firm's managers know its true value V; however, the managers of the acquiring firm know only that the true value lies in some range between a low value L of $100,000 and a high value H of $10 million. Moreover, to simplify the discussion, assume that the beliefs of the acquiring firm's managers are uniform, meaning that they believe true value V is as likely to take on any value between the low value and high value as any other value.

Suppose further that the value of the synergy is 85 percent of the true value of the target. That is, the true worth of the target firm to the acquiring firm is $1.85 million. Call the 85 percent a *synergy factor,* and the term $Q = (1 +$ synergy factor) the *synergy multiplier*.

Analytical Solution

The managers of the acquiring firm do not know the true value of the target firm. Therefore they do not know that the value of the synergy is $850,000 and that the technology is worth $1.85 million to them. Only the target firm's managers know their firm's true value. The best that the acquiring firm can do is to estimate the true value, based on their beliefs, using expected value. Because the managers of the acquiring firm hold uniform beliefs, their best estimate of the target firm's true value is $5.05 million [= ($100,000 + $10 million)/2].

Heuristic

Imagine that the managers of the acquiring firm try to assess the maximum amount P that they should be willing to pay in order to acquire the target. The acquiring firm managers could use a simple heuristic, such as to pay at most 1.85 times their best estimate, in this case $9.34 million = $1.85 \times $5.05 million. Is this a sensible heuristic, or is it a naïve heuristic?

In order to evaluate the heuristic, suppose that the target were actually worth $9.5 million. Would the target firm's managers be willing to sell their technology for

$9.34 million? If the target firm's founders are rational, then they should not accept an amount less than $9.5 million and therefore should reject the offer. Therefore rational target managers will only be willing to sell their firm if its true value is no more than $9.34 million.

Managers of a rational acquiring firm would realize that if they offered $9.34 million, and the target managers were also rational, then the expected value of the target whose founders who accept their offer of $9.34 million would be $4.7 million [= ($100,000 + $9.34 million)/2] to the founders and $8.7 million (= 1.85 × $4.7 million) to themselves.

Winner's Curse

An acquiring firm that pays $9.34 million for a technology that on average is worth $8.7 million to them will, on average, suffer from the winner's curse. The simple heuristic, to pay at most the sum of the best estimate plus associated synergy value, is indeed naïve, and leads to the winner's curse, at least on average.

On Average

The phrase *on average* is important. Winner's curse is not inevitable in each and every case. It is entirely possible that the target firm is worth $7 million, in which case the acquiring firm's managers offer to pay $9.34 million, rational target firm managers accept, and the acquiring firm receives something worth $12.95 million to them.

Avoiding Winner's Curse

How can an acquiring firm avoid the winner's curse, on average? They need to use a different rule, based on a different implicit question. The question implicit in the naïve heuristic is: "What is our estimate of how much the target firm is worth to us?" The question that the acquiring firm needs to ask is: "What is our estimate of how much the target firm is worth to us, given that we offer to pay P and our offer is accepted?"

The managers of the acquiring firm need to realize that the managers of the target firm will not accept any offer less than true value, whatever that number is. Therefore, if the acquiring firm makes an offer of P less than $10 million and the target firm managers accept, then the managers of the acquiring firm might well reasonably infer that the true value will not be greater than P and therefore will lie somewhere between $100,000 and P. Given their uniform beliefs, the managers of the acquiring firm would then estimate the true value of the target to be ($100,000 + P)/2.

A Key Equation

Consider the special case in which the true value happens to be this amount. Because the acquiring firm is able to use its assets synergistically, and add value $0.85 \times V$, the expected value of the target firm to the acquiring firm would be $1.85 \times$ ($100,000 + P)/2. Of course, the acquiring firm does not know whether or not the target's true value is equal to ($100,000 + P)/2, the latter only being its best estimate. Because P represents the maximum amount that the acquiring firm should

pay in order to acquire the target, acquiring the target should amount to a zero net-present-value project. The value of what it expects to receive, $1.85 \times (\$100{,}000 + P)/2$ should be equal to what it pays, P. That is, $P = 1.85 \times (\$100{,}000 + P)/2$. Solving this equation for P leads to the following statement: The maximum amount P that the acquiring firm should offer for the technology is

$$\text{Highest offer } P = \frac{\text{Worst-case value} \times \text{Synergy multiplier}}{2 - \text{Synergy multiplier}}$$

Using the numbers in this example, the acquiring firm would not be willing to pay more than $1.23 million for the target firm, in that $1.23 = 0.1 \times 1.85/0.15$.

Luck and Risk

It is very important to understand what kind of a gamble the acquiring firm faces were it to offer to pay P. If the acquiring firm is very unlucky, then the true value will turn out to be $100,000, in which case the acquiring firm will incur a net loss in value, since $1.85 \times \$100{,}000$ is less than P. That is, the acquiring firm pays $1.23 million but ends up with an asset that is only worth $185,000 to them. In this case, the acquiring firm would overpay by the amount $1.04 million.

If the acquiring firm is extremely lucky, then the founder's true value will turn out to be P, in which case the acquiring firm will incur a net gain. That is, the acquiring firm pays $1.23 million for a technology that is worth $2.28 million to them. In this case, the acquiring firm would underpay by the amount $1.04 million.

Taken together, the last two paragraphs make the point that the acquiring firm faces risk when it pays P for the target. Notice the symmetry in the preceding two paragraphs, in that the magnitude of the overpayment and underpayment are identical. On average, the acquiring firm neither overpays nor underpays when offering to pay $P = \$1.23$ million. Conceivably, the acquiring firm's managers might require a premium to compensate them for the risk, which would lead them to shave some amount off of P. However, for the sake of exposition, at this point assume that the managers of the acquiring firm act in a risk-neutral fashion and do not require a risk premium.

When Synergy Is Large

When the synergy multiplier Q exceeds 2, then the synergy value that the acquiring firm can add exceeds 100 percent of the target's true value. Think about the implications for the value of P when Q is less than 2, but approaches 2, and the worst-case value, here $100,000, is positive. Notice that in this case, the value of P will approach infinity. Of course, the maximum amount that the target could possibly be worth to the acquiring firm is $18.5 million $= 1.85 \times \$10$ million. The acquiring firm should certainly not pay more than $18.5 million. Doing so would lead to the winner's curse. Even $18.5 million is too high.

In order to understand how to determine P when Q gets closer to 2, suppose that Q were 1.99 rather than 1.85. In that case, the equation stipulates that P should be $19.9 million, more than the $18.5 million that the target firm could possibly be worth. However, were the acquiring firm to bid $19.5 million, then even an entrepreneur whose technology is worth $10 million would be willing to accept the bid.

In this case, the maximum expected value that the acquiring firm receives when bidding $19.9 million is $10.05 million [= $1.99 \times (\$100,000 + \$10$ million/2)]. But this means that the acquiring firm should bid no more than $10.05 million. Bidding more would lead to the winner's curse.

Graphical Analysis

A graphical depiction of the optimal bidding rule P provides additional insights. Consider the case where $Q = 1.1$. Examine Exhibit A10.1. The x-axis in this figure is P, in millions of dollars. There are three lines plotted. The first is the 45-degree solid line and represents the value of P itself. The second line (dotted) is the function $Q \times (L + P)/2$, which is the value that the acquiring firm expects to receive when it pays P and the lowest possible value of the target firm is L (here $L = \$100,000$). The third line (dashed) is horizontal, with a value of $Q \times (L + H)/2$, where H represents the highest possible value for the technology (here, $H = \$10$ million.) This value is the maximum value that the acquiring firm should bid for the technology and applies when P is at least H, in which case all rational target managers would find it in their best interest to accept the acquiring firm's offer of P.

Consider the intersection between the dotted line and the 45-degree solid line. At the intersecting point, $P = Q \times (L + P)/2$. That is the expected value for when the amount the acquiring firm's shareholders receive is just equal to the amount the acquiring firm shareholders pay. The intersection occurs at $P = 0.12$ (meaning, $120,000). Notice that for values of P below 0.12, $P < Q \times (L + P)/2$. Therefore those bids are too low: The acquiring firm expects to receive back more in value than what it pays. For $P > 0.12$, the reverse is true. The acquiring firm pays more than it expects to receive back in value. In addition, 0.12 million is less than $10 million ($H$), and less than $5.56 million [$Q \times (L + H)/2$]. In particular, the intersection occurs below the horizontal line. Therefore $0.12 million is the most that the acquiring firm's managers should bid for the target firm.
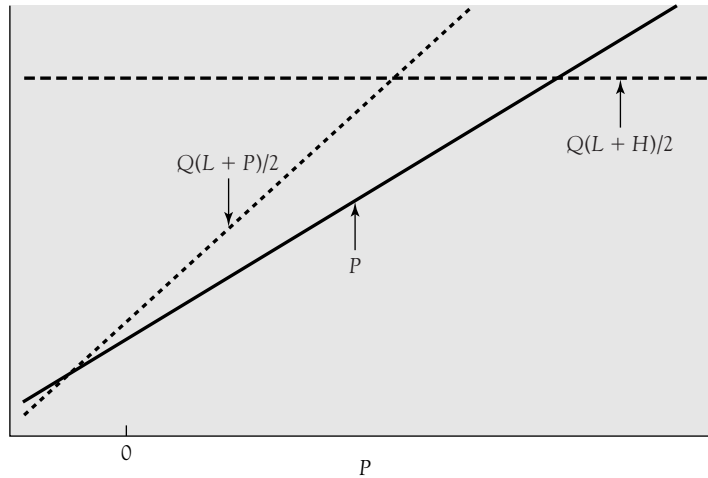
EXHIBIT A10.1
Solution for Maximum Bid
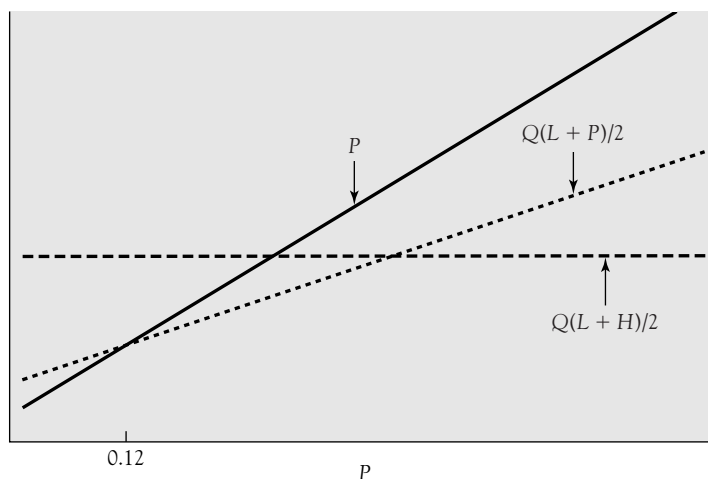
EXHIBIT A10.2
Solution for Maximum Bid
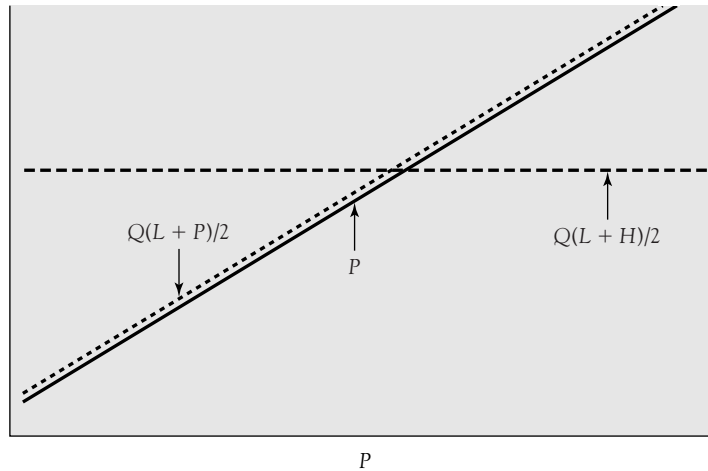
EXHIBIT A10.3
Solution for Maximum Bid

When the synergy multiplier Q approaches 2, and then moves above 2, the formula for P breaks down. Exhibits A10.2 and A10.3 show what goes wrong. Exhibit A10.2 displays the case $Q = 2$. Notice that in this case the graph of the equation for $Q \times (L + P)/2$ is parallel to the 45-degree line. Therefore there is no intersection. In fact, $Q \times (L + P)/2 > P$ for all P, suggesting that the acquiring firm receives more in value than what it pays, no matter how high its bid P. Of course, this cannot be true, because once a target firm that is worth \$10 million (H) is induced to accept the acquirer's offer, the most that the target is worth on average is \$10.1 million. Therefore the acquirer's maximum bid P should be \$10.1 million.

Exhibit A10.3 illustrates the case when the synergy multiplier Q is 3. In this case, there is an intersection, but it occurs in the negative quadrant. For positive values of P, $Q \times (L + P)/2 > P$ for all P, just as in Exhibit 10.2, and the same logic applies.

A10.2   TWO MONTY HALL PROBLEMS

What makes the acquiring firm vulnerable to the winner's curse in the decision task in Section A10.1 is the reliance on a heuristic that fails to take into account the combination of asymmetric information and conflicting interests between the parties. One way to help bidders become more cognizant of this combination is to work through two versions of the Monty Hall problem. The Monty Hall problem stems from Monty Hall's television program *Let's Make a Deal*. The two versions of the problem follow.

Conventional Monty Hall Problem: Monty Always Open

Imagine that you are participating in a game where you are given a choice between selecting boxes 1, 2, and 3. One of these boxes has a valuable prize in it. The other two boxes are empty. After you pick one of the boxes, the game host will definitely open one of the other two boxes, never a box with a prize in it; show you that this unchosen box does not have the prize; and offer you the opportunity to trade the box you originally chose for the other unopened box. For example, if you were to choose box 1, the game host would open one of the two other boxes (for example, box 2) and show you that it's empty. The host would then offer you the opportunity to switch your choice from box 1 to box 3. What would you do if you were in this situation, accept the host's offer to switch your choice or turn down the offer and keep your original choice? (Do not attempt to answer this question yet, just read on.)

Consider next a variant of the Monty Hall problem called *Mean Monty.*

Mean Monty

Imagine that you are participating in a game where you are given a choice between selecting boxes 1, 2, and 3. One of these boxes has a valuable prize in it. The other two boxes are empty. After you pick one of the boxes, the game host may open one of the other two boxes, never a box with a prize in it; show you that this unchosen box does not have the prize; and offer you the opportunity to trade the box you originally chose for the other unopened box. The host will make his decision whether or not to open the box and offer you the opportunity to switch, with the goal of minimizing the likelihood that you get the prize. For example, if you were to choose box 1, the game host might decide to open one of the two other boxes (for example, box 2), show you that it's empty, and offer you the opportunity to switch your choice from box 1 to box 3. Question: What would you do if you were in this situation, accept the host's offer to switch your choice or turn down the offer and keep your original choice?

Having read the preceding questions, please answer the following four-part question:

1. What is the key difference between the Monty Always Open situation and the Mean Monty situation?
2. Should this difference affect the advice you would offer to anyone facing these situations?
3. If your answer to part 2 is no, move on to part 4. If your answer to part 2 is yes, how would the advice differ between the two situations?
4. What connection, if any, is there between the Monty Hall problems and the M&A decision described in Section A10.1?

The main difference between the two versions of the Monty Hall problem is that in the first version, Monty always opens a door for you. In the second version, Monty only opens a door if doing so increases the likelihood that you will be worse off as a result. In the conventional problem, contestants pick from among three doors and win a prize that is behind the door. If there is nothing behind the door, they win $0. In the conventional Monty Hall problem, the contestant first picks a door. Monty then opens a door that the contestant did not pick, which has nothing behind it, and asks the contestant if he or she wishes to switch the choice.

Exhibit A10.4 depicts two tables, the top for the conventional Monty Hall Problem and the bottom for the Mean Monty problem. Each table is based on nine events. Your choice of box is followed by chance's choice of box. In the top part of the table, the contestant who does not switch (you) wins in 3 of the 9 events. All events are equiprobable, and so the probability of winning if you do not switch is $1/3$.

The most important issue in this exercise is to work out the series of events. Bayes rule is a relationship between conditional probabilities. If A and B are two events, then Bayes rule states that $\text{Prob}\{A \mid B\} = \text{Prob}\{B \mid A\} \times \text{Prob}\{A\}/\text{Prob}\{B\}$. Bayes rule is very simple here. Suppose you are the contestant. You win if you switch and were originally wrong. Suppose you switch. Then the probability of you switching is 1. The probability of you switching, given that you win is also 1. The probability of you originally making the wrong choice is $2/3$. Bayes rule stipulates that

$$\text{Prob}\{win|switch\} = \frac{\text{Prob}\{switch|win\} \times \text{Prob}\{win\}}{\text{Prob}\{switch\}}$$
$$= \frac{1 \times 2/3}{1}$$
$$= \frac{2}{3}$$

This means that by switching, you increase the probability of winning from $1/3$ to $2/3$.

Therefore, the advice in the conventional Monty Hall problem is to switch. However, as the bottom table in Exhibit A10.4 shows, the advice in the Mean Monty problem is not to switch.

Interestingly, in *Let's Make a Deal,* many contestants did not accept Monty Hall's offer to switch. Monty Hall himself thinks that you do not change the odds of winning by switching because the probability that the door you picked has a prize behind it has not changed.

EXHIBIT A10.4

Monty Hall Problem

You Pick	Chance Picks	Monty Shows You	Result if You Switch	Result if You Don't Switch	Win Indicator Switch	Don't Switch
1	1	2 or 3	Lose	Win	0	1
	2	3	Win	Lose	1	0
	3	2	Win	Lose	1	0
2	1	3	Win	Lose	1	0
	2	1 or 3	Lose	Win	0	1
	3	1	Win	Lose	1	0
3	1	2	Win	Lose	1	0
	2	1	Win	Lose	1	0
	3	1 or 2	Lose	Win	0	1
				Probability of winning	66.67%	33.33%

Mean Monty Problem

1	1	2 or 3	Lose	Win	0	1
	2	Nothing	Lose	Lose	0	0
	3	Nothing	Lose	Lose	0	0
2	1	Nothing	Lose	Lose	0	0
	2	1 or 3	Lose	Win	0	1
	3	Nothing	Lose	Lose	0	0
3	1	Nothing	Lose	Lose	0	0
	2	Nothing	Lose	Lose	0	0
	3	1 or 2	Lose	Win	0	1
				Probability of winning	0.00%	33.33%

Mean Monty will not give you an opportunity to switch when you've guessed wrong, only when you've guessed correctly. The thing is, Mean Monty knows what's really behind those doors.

Studies have found that bidders are more likely to avoid the winner's curse in the asymmetric information problem, if they first encounter the two versions of the Monty Hall problem, and answer the four questions described earlier.[1] The connection between the Monty Hall problems and the bidding problem is that both feature asymmetric information. Notably, in Mean Monty, as in the bidding problem, the interests of the other party are in conflict with the decision maker.

## A10.3 ILLUSTRATIVE EXAMPLE: CISCO SYSTEMS

Chapter 10 makes brief mention of Cisco Systems, one of the major acquirers during the 1990s. Cisco Systems operates a broad-line networking business and has been one of the most active acquirers in the United States. Exhibit A10.5 depicts the distribution of acquisition prices made by Cisco Systems between 1997 and 2002. Notice that most of the prices are less than $500 million. However, Cisco made four acquisitions for which it paid more than $2 billion per acquisition. And there is one clear outlier, a $6.9 billion tail event, Cisco's fortieth acquisition, a firm named Cerent.

Cisco's acquisition activity began in 1993 when one of Cisco's senior vice presidents, John Chambers, developed a plan to grow the firm through acquisitions. That

EXHIBIT A10.5
**Histogram of Value
of Cisco System
Acquisitions, 1997–2002**

Source: Cisco Systems Web site,
www.cisco.com.
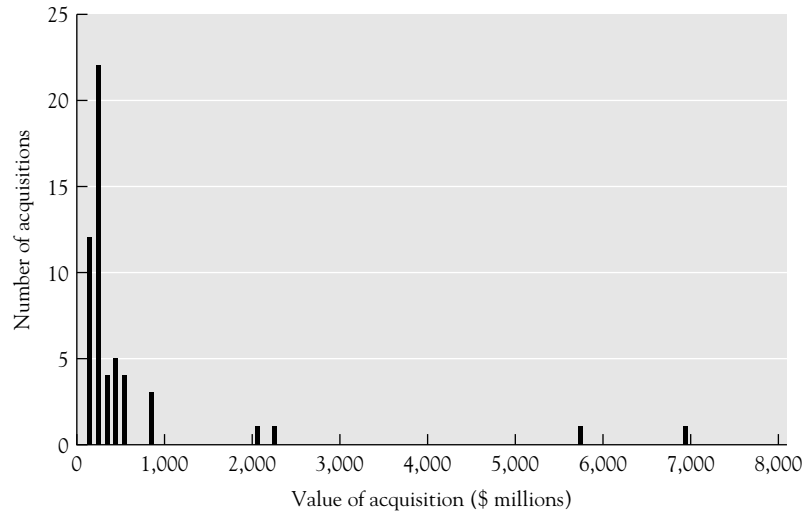
year, Cisco acquired Crescendo Communications Inc. for about $95 million in
Cisco stock. Six and a half years later, in 1999, Cisco's market capitalization stood
at more than $220 billion, and John Chambers was its CEO. Crescendo's switches,
along with products from more than 35 acquisitions, were at the heart of a unit that
had nearly $7 billion in annual sales. Crescendo had been a very successful acquisi-
tion, and John Chambers talked about it proudly. Cisco shareholders did not suffer
from the winner's curse in respect to Crescendo.

Cerent Corporation

In 1999, Cisco became interested in acquiring Cerent Corp.[2] Cerent was a closely
held firm that made devices to route telephone calls and computer traffic on and off
fiber-optic lines. Its first products were completed in September 1998, and it quickly
won orders from more than 70 firms. Cerent's customers testified that its product
was less expensive and more efficient than the products of its main competitors,
Nortel and Lucent.

Despite its sales success, in July 1999 Cerent reported that for the first half of the
year it lost $29.3 million on revenue of $9.9 million. Indeed, since being founded in
1997, Cerent had reported cumulative losses of $59.7 million. Moreover, the firm
indicated that it was expecting to incur negative cash flow in the future. Cerent had
consumed $17 million in cash during the first half of 1999 and was holding less than
$6 million in cash, and $10 million in available debt.

In view of its cash flow projections, Cerent filed with the SEC to go public in an
initial offering that was expected to raise $100 million. In July 1999, Michael Dell,
the founder and CEO of Dell Computers, invested $30 million in the firm.

Market Valuation of Networking Firms

Cisco System had been an early investor in Cerent and owned 9 percent of the firm.
It was contemplating the acquisition of the remaining 91 percent. At the time Cerent

EXHIBIT A10.6

Cisco Systems Market Value of Equity, Jan. 1994–Dec. 2002

Source: Center for Research in Security Prices.
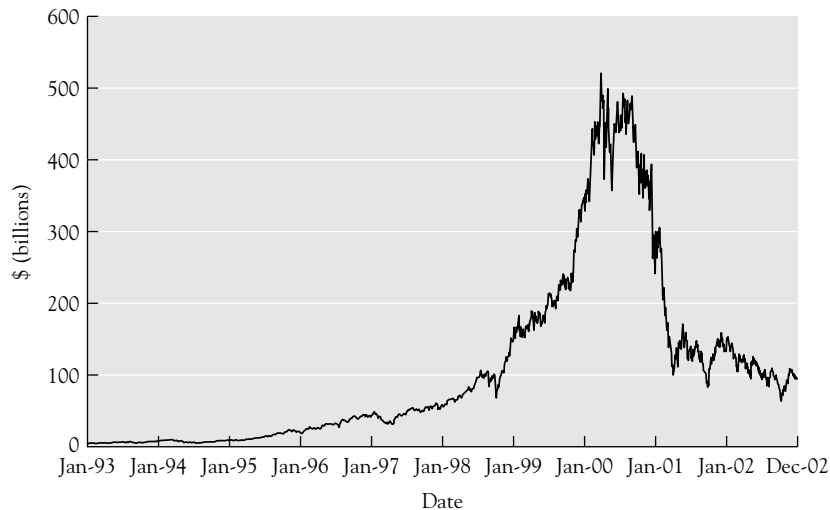
was a small firm and had just 266 employees. Yet, the price of publicly traded networking firms had been soaring. For example, the firm Redback Networks Inc. had gone public a few months before and was valued at nearly $6 billion. Another firm, Juniper Networks Inc., was valued at nearly $11 billion.

Cisco's director of business development, Ammar Hanafi, indicated that the collective feeling at Cisco was that Cerent "was going to be as big as Juniper." In August 1999, Cisco purchased the remaining 91 percent of Cerent, paying about $6.9 billion in stock, by far the most that it had ever paid to acquire another firm.[3] At the time Cisco negotiated the price of Cerent, Cisco's market capitalization was about $225 billion, and it was the second largest firm trading on the Nasdaq. See Exhibit A10.6. Cisco shareholders exchanged 3 percent of their firm's stock for a firm that had yet to show a profit, was expecting to raise $100 million in an IPO, and had fewer than 300 employees. Did Cisco's managers, and by implication its shareholders, suffer from the winner's curse? Without a doubt they did.

Perspective of Cisco Managers

What were Cisco's executives thinking at the time?

Interview, October 1999 In October 1999, John Chambers was interviewed by *The Wall Street Journal* about his approach to Cisco's acquisitions.[4] Chambers indicated that during the next year, he expected his firm to make between 30 and 40 more acquisitions.

John Chambers stated that most acquisitions fail and noted that success involved a combination of factors. First, he thought that the acquirer had to grow the target's revenues dramatically during the first year after the acquisition.

Second, Chambers pointed out that the value of the acquisitions is mostly related to intellectual capital residing in the heads of the target firm's employees, making retention a key priority. He stated that it is typical that in the two years following an

acquisition, between 40 and 80 percent of top executives and top engineers will have left. In contrast, Cisco's attrition rate was about 6 percent a year.

Third, Chambers indicated that in order for a combination to generate synergy, the target firm's strategy had to be sufficiently different from that of Cisco. However, the target's strategy could not be too different from that of Cisco. Otherwise no synergy would be possible.

Fourth, Chambers indicated that the culture of the firm had to be sufficiently similar. Culture included the reliance on employee stock options for incentives, and the avoidance of unnecessary perquisites for upper-level executives. Culture also included a strong focus on customer needs.

Trusting Market Prices   In paying $6.8 billion for Cerent, Cisco's managers trusted market prices. They trusted the market's assessment that networking firms such as Redback and Juniper were indeed worth several billion dollars. Cisco's financial managers had been educated in business schools that taught efficient-market theory. They acknowledge having pegged their valuation of Cerent to the valuations of Redback and Juniper.

Price-to-Sales Heuristic   John Chambers indicated that he initially blanched when he heard the proposed price for Cerent. However, he stated that he began to see the logic in the amount. Although Cerent had less than $10 million in revenue in the six months ended June 1999, Chambers pointed out that the rate at which it was increasing product shipments was $100 million per year. In this respect, Cisco executives expected Cerent's revenue to increase to about $300 million the next year. Chambers explained that the ratio obtained by dividing the $7 billion purchase price by the $300 million sales produced a price-to-sales ratio of 23, a multiple that was consistent with Cisco's financial structure at the time. The use of price-to-sales valuation heuristics was common at the time for firms that did not have positive earnings.

Overconfidence   John Chambers compared Cerent with Crescendo Communications Inc., which had roughly $10 million in annual sales when Cisco acquired it for $92 million in 1993. As was mentioned earlier, Chambers was proud of the Crescendo acquisition. Any hint of overconfidence here, with the overemphasis on past successes? Remember that people tend to take credit for past successes, but attribute past failures on bad luck or others. This tendency is known as fundamental attribution error, and it leads people to become overconfident.

No DCF   The vice president of business development at Cisco did not routinely insist that a thorough present-value discounted flow analysis be undertaken in order to ascertain the intrinsic value of the acquisition. No such analysis was undertaken in connection with Cerent, which means that managers relied on the affect heuristic. In fact, the negotiations for acquiring Cerent were conducted in less than three hours, spread across three days. By not undertaking a thorough valuation analysis of Cerent, Cisco executives succumbed to confirmation bias: They did not search for information that might disconfirm their views about the intrinsic value of Cerent.

Pooling of Interests   Cisco's managers structured the acquisition as a "pooling of interests" rather than a "purchase," thereby avoiding what is known as goodwill. As

was mentioned in Chapter 10, goodwill is the difference between the purchase price paid for an acquisition and the fair value of the target firm's net assets. At the time, the purchase method required the firm to record goodwill on its balance sheet and subsequently amortize goodwill as an expense on its income statement. Pooling allowed the acquiring firm to avoid recording goodwill and the associated expensing. The amount of goodwill in Cisco's acquisition of Cerent was close to the entire purchase price.

By structuring the acquisition as a pooling of interests, Cisco completely avoided these expenses. Therefore, if they overpaid for Cerent, the overpayment would not show up in their earnings. Notably, there were no cash flow implications attached to pooling: It was a pure framing issue. Pooling of interests is no longer allowed.

Psychophysics   Cisco's managers viewed the $7 billion as a small fraction of their firm, expressing the view that it was only 3 percent. This is a framing issue known as the principle of psychophysics, the tendency to misgauge absolute amounts by overfocusing on percentage amounts. Seven billion dollars is a lot of money, be it 3 percent or 30 percent of Cisco's market capitalization.

Stock, Not Cash?

Were Cisco's managers excessively optimistic and overconfident? To be sure, Cisco paid in stock, not cash. As was mentioned earlier, excessively optimistic, overconfident executives prefer to pay in cash, not stock. Of course, that conclusion rests on the assumption of market efficiency. Was Cisco stock overvalued at the time of the Cerent acquisition? In October 2002, Cisco's market cap had fallen to $72.3 billion. Looking back, Cisco executives judged that they had overpaid for Cerent by a substantial amount, but noted that they had overpaid with their own overvalued stock. However, that is easy to say in hindsight.[5]

Within a few months of acquiring Cerent, the perspective of Cisco's executives was very different. In 2000, Cisco Systems was the most valuable company in the world, with a market capitalization that exceeded $500 billion. See Exhibit A10.6. Based on the market valuations of networking firms at the height of the technology stock bubble in March 2000, *The Wall Street Journal* reported that six months after the acquisition, the purchase price for Cerent appeared to be a bargain.

A10.4   ILLUSTRATIVE EXAMPLE: AT&T

In 1997, AT&T hired C. Michael Armstrong as its CEO. Armstrong had been the successful CEO of Hughes Electronics and a star manager at IBM for 30 years. When he arrived at AT&T, the firm was slumping. In response, Armstrong charted a bold, aggressive strategy for the firm. The strategy was based on product offerings to homes and businesses that packaged telephone, cable, and high-speed Internet service, all offered through communication lines controlled by AT&T.

To execute the strategy, AT&T made two major acquisitions, Tele-Communications Inc. for $55 billion and MediaOne Group for $44 billion. Within two years, AT&T had become the largest cable operator in the United States. By the end of 2000, the firm had 500,000 cable-telephone subscribers.

Two of AT&T's competitors in the market for long-distance telephone service were WorldCom and Quest. This market was highly competitive, and WorldCom had begun a price war. As a result, AT&T's revenue fell below its forecasted revenue. In addition, its managers shifted their focus away from AT&T Broadband, the firm's cable business, and hundreds of thousands of dissatisfied customers dropped their subscriptions.

AT&T faced high costs, partly due to operating problems. During early 2000, it lowered the earnings guidance it provided to Wall Street analysts. In contrast, its main competitor, WorldCom, was reporting healthy earnings. The price of AT&T stock fell sharply, as investors judged that AT&T was unable to compete with its more nimble, efficient competitors. As it turned out, WorldCom had engaged in fraudulent accounting, which caused its earnings (though not its cash flow) to appear higher than they were. In an effort to improve its own earnings, AT&T decided to lay off 20,000 employees in an effort to reduce costs by $7.5 billion.

In 2000, AT&T carried $65 billion of debt. In the face of declining cash flows from operations and a lack of confidence from investors, CEO Armstrong realized that the firm faced the real risk of bankruptcy. In consequence, he decided to split up the firm. In October 2000, AT&T sold its cable business to Comcast for $50.7 billion, about half of what it had paid just a few years before. In 2002, Michael Armstrong became chairman of Comcast.

A10.5   ILLUSTRATIVE EXAMPLE: 3COM AND U.S. ROBOTICS

3Com is a networking firm with a rich history. In 1985 it had sales of about $55 million. Over the next 15 years it grew to become a member of the Fortune 500, was included in the S&P 500, and paid $10 million to have San Francisco's stadium Candlestick Park renamed 3Com Park.

Between 1991 and 1996, its average rate of sales growth was 51 percent. Between January 1991 and July 1995, its stock went up more than tenfold. During this period, its dominant product was the adapter board, a device that enabled a stand-alone personal computer to be connected to a network. However, in 1996, 3Com's upper-level managers foresaw that future adapter board sales would decline, and they were seeking alternatives. Indeed, the market also appeared to be aware of the situation. Between July 1995 and July 1996, 3Com's stock price declined from $74 to $40.

In 1996, 3Com began discussions with the firm U.S. Robotics about a possible combination. U.S. Robotics was best known as a producer of modems, but it also produced remote-access products that fit perfectly with 3Com's business strategy. 3Com perceived an opportunity to increase sales of its own switches, hubs, and router products through U.S. Robotics' presence in the telecommunications and consumer markets.

In the course of performing due diligence, both companies analyzed the rate at which U.S. Robotics' sales and net income had been growing, as well as the trends in its cash, accounts receivable, and inventory. U.S. Robotics' marketing strategy was aimed at maximizing market share in an effort to dominate the markets for its

products. Its customers maintained high inventories of U.S. Robotics products, so-called channel inventory.[6] U.S. Robotics' management used channel inventory strategically, in order to limit their competitors' access to retail shelf space. In pursuing this strategy, U.S. Robotics occasionally offered extended credit terms to retailers.

Risks and Benefits

Undoubtedly, both parties foresaw that there were risks to each in going forward with the deal. Undoubtedly, U.S. Robotics was aware that 3Com had missed its recent quarter, and in fact had preannounced[7] that actual earnings would fall short of analysts' estimates. Although the lower stock price that resulted for 3Com meant that U.S. Robotics' shareholders would receive a larger share of 3Com's equity, U.S. Robotics' executives would most likely have been concerned that the missed quarter might be the beginning of a negative trend.

Undoubtedly, 3Com executives would have forecasted U.S. Robotics' future sales and been concerned about the risks. Those risks would have involved the widely reported high levels of channel inventory. Undoubtedly 3Com's executives would also have been concerned that U.S. Robotics' cash and short-term investments had been declining rapidly and that its accounts receivables had been rising dramatically, to the point where in the second quarter of fiscal year 1997 accounts receivables exceeded sales.

Notwithstanding the issues just mentioned, the executives of both companies made the decision to go forward with the deal. Apparently both decided that the combination of risks and benefits offered by the deal exceeded the risks and benefits attached to the status quo. And so the deal was done, announced in February 1997, and formally completed in June 1997.

Think about the general situation in which 3Com's managers found themselves. Did they perceive themselves to be in the domain of losses? Remember that people who perceive themselves to be in the domain of losses are prone to taking risks that are actuarially unfair, hoping to be lucky.

Outcome

Did 3Com turn out to be lucky, or did their merger with U.S. Robotics turn out the way their managers feared? 3Com's fiscal year ended in May, and in September it announced quarterly earnings for the newly combined firm. Operating (pro forma) net income for the quarter was $172.2 million, or $0.48 per share, compared to $152.0 million, or $0.43 per share, posted in the year-ago quarter. 3Com's quarterly sales of its systems products were 34 percent higher than compared to the same quarter a year before.

Business Wire quoted 3Com's CEO as saying: "The merger of 3Com and U.S. Robotics is off to a tremendous start. Our customers are beginning to see the benefits of our expanded product line, new products, broader distribution capabilities, and operating efficiencies. As a result, our first quarter as a combined company has led to increased market share and sequentially improved operating margins."[8]

Trouble

The second quarter turned out to be more problematic. As the quarter came to an end, analysts began to forecast that sales for what were formerly U.S. Robotics' products would be disappointing because 3Com had been slowing modem shipments in order to reduce distributor inventory levels that were excessively high. *Dow Jones Online News* quoted analyst Al Tobia, from NationsBanc Montgomery Securities Inc., as saying: "We believe that 3Com management could elect to substantially miss the November quarter in order to . . . eliminate the lion's share of modem channel inventory."[9] Indeed, 3Com's net income for its second quarter turned out to be $15.1 million, or $0.04 per share on sales of $1.2 billion, compared to $1.6 billion during the prior quarter.

Nasty Surprise

In the end, concerns about channel inventory turned out to be correct. Prior to the announcement of the merger, Wall Street analysts' had projected that U.S. Robotics' sales for the quarter ending June 30, 1997, would be $770 million, on a stand-alone basis, an 11.5 percent increase over the prior quarter. This turned out to be inaccurate, with repercussions for the long-term.[10] It is not possible to know how U.S. Robotics would have performed as a stand-alone company, since the firm was acquired by 3Com, and did not have to report a quarter on its own. However, subsequent reporting showed that U.S. Robotics' April-May sales were but $15 million! Notwithstanding this low level of shipments, which should have reduced channel inventory substantially, the new 3Com still faced substantial inventory channel issues, which led to the shortfall in sales in the November quarter. 3Com's stock price fell from $55 to $23 over the next 13 months, and this during a strong bull market.

In the end the inventory channel risk that 3Com's managers identified turned out as they expected, if not worse. Yet, at the same time, 3Com turned out to be lucky. At the time, 3Com believed that the value of acquiring U.S. Robotics acquisition lay with its remote-access business. In this belief, they were wrong. However, U.S. Robotics had a business that produced a personal digital assistant known as the Palm Pilot. Although the Palm business received very little attention from 3Com's managers at the time, the Palm turned out to create considerable value for 3Com's investors.

Additional Questions

1. Compare AOL's acquisition of Time Warner with Cisco's acquisition of Cerent. In what ways are the two acquisitions similar, and in what ways are they different?

2. Consider the situation that Michael Armstrong faced when he took over as CEO at AT&T. Does this kind of situation give rise to any psychological phenomena of which managers and directors should be aware?

3. Discuss the connection between WorldCom's use of fraudulent accounting and the decisions made by AT&T's managers.

4. Chapter 10 mentions AT&T's acquisition of NCR. In the five months that followed AT&T's announcement that it planned to acquire NCR, the cumulative abnormal return over the negotiation period for this merger, 11/01/90–05/07/91, was −13.33 percent for AT&T and +120.29 percent for NCR. At the beginning

of this period, AT&T's stock price was $34 and it had 1.092 billion shares outstanding. In contrast, NCR's stock price was $47.25 with 64.5 million shares outstanding. On May 7, 1991, how much value did the market judge that AT&T would destroy by acquiring NCR? To answer this question, fill in the table that begins in cell B3 in the worksheet *ATT NCR* of the spreadsheet *Chapter 10 answer template.xls*.

5. By September 19, 1991, when the merger of AT&T and NCR was complete, the cumulative abnormal return to AT&T stock, measured from 11/01/90 was −17.62 percent and the cumulative abnormal return to NCR stock was +113.53 percent. On September 19, 1991, how much value did the market judge that AT&T would destroy by acquiring NCR? To answer this question, fill in the table that begins in cell B23 in the worksheet *ATT NCR* of the spreadsheet *Chapter 10 answer template.xls*.

6. Looking back in hindsight from September 19, 1991, the date the merger between AT&T and NCR took effect, what price per share should AT&T have paid for NCR in order that it not destroy value for AT&T shareholders? As part of your answer, discuss whether the events described in Questions 4 and 5 relate to any general phenomena described in the body of the chapter.

7. In order to qualify as a pooling of interests, AT&T's acquisition of NCR featured a share exchange, but no cash. Discuss this issue in light of the theoretical discussion provided about the role of cash in mergers and acquisitions.

8. Consider the example describing 3Com's acquisition of U.S. Robotics. To what extent does this example feature agency conflicts, and to what extent does it feature behavioral phenomena? Discuss this question.

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[1] See Tor Avishalom and Max Bazerman, 2003. "Focusing Failures in Competitive Environments: Explaining Decision Errors in the Monty Hall Game, the Acquiring a Company Problem, and Multiparty Ultimatums, *Journal of Behavioral Decision Making*, Volume 16, Issue 5, 353–374.

[2] See "Cerent Files for IPO, Discloses Investment by Chairman of Dell," *The Wall Street Journal,* July 26, 1999.

[3] See Scott Thurm, "Joining the Fold: Under Cisco's System, Mergers Usually Work; That Defies the Odds—Ms. Gigoux's SWAT Teams Oversee the Integration of Newly Acquired Units—'The Borg' of Silicon Valley?" *The Wall Street Journal*, March 1, 2000.

[4] See "Cisco Systems' Chief Executive Tells Why Firm Is in Such a Buying Mood," *The Wall Street Journal*, October 13, 1999.

[5] Interview with Tom Cupples, Cisco Systems, May 6, 2003.

[6] Channel inventory is inventory held by U.S. Robotics channel partners that has not yet been sold to final customers.

[7] That is, 3Com issued a press release to announce that it expected that its earnings for the *current* quarter would end up falling short of analysts' estimates.

[8] See "3Com Announces Record Revenues for First Quarter of Fiscal 1998," *Business Wire*, September 23, 1997.

[9] See Joelle Tessler (staff reporter), "Analysts Say That 3Com Could Miss Even Lower 2nd-Quarter Estimates," *Dow Jones Online News*, November 20, 1997.

[10] This was in line with analysts' estimates at the time.