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Lessons of the Last Bubble

Smaller bets can make the next technological boom more productive and enduring.

by **Tim Laseter, David Kirsch, and Brent Goldfarb**

Q uiz time: What percentage of dot-com startups have failed?

If you are like most people we have informally surveyed, you probably estimated around 90 percent. A

few people posit a slightly lower failure rate; some say the rate was 98 percent or more. Virtually no one assumes that the numbers of dot-com failures and successes have been roughly equal, but that's what our research found. Of nearly 2,000 business-to-business (B2B) e-Marketplaces launched during the dot-com days, 55 percent remained active for at least two years after September 2002, when the Nasdaq hit its lowest point. (See "Through the Service Operations Looking Glass: An Empirical Model of B2B eMarketplace Failures," by T. Laseter, E. Rosenzweig, and A. Roth, Darden School working paper.) We conducted a separate study of a random sample of companies seeking venture-capital funding in 1999 and found that the five-year survival rate was 48 percent. (See "Small Ideas, Big Ideas, Bad Ideas, Good Ideas: 'Get Big

Fast' and Dot Com Venture Creation," by David Kirsch and Brent D. Goldfarb, Robert H. Smith School of Business research paper no. RHS-06-049, Nov. 2006, <http://ssrn.com/abstract=946446>.)

The misperceptions are understandable. Fresh are the memories of such mega-failures as Webvan and eToys, along with the Nasdaq's staggering \$4.4 trillion drop in market capitalization over the course of the 30 months between its peak in March 2000 and that September 2002 nadir. We now know that the collective business psyche overreacted to the market potential of the Internet, and that led to an inevitable correction. Some pundits are starting to proclaim a new "Web 2.0" era, arguing that we overreacted on the downside as well.

Karl Marx once said that "history repeats itself, first as tragedy, second as farce." But understanding the lessons of the early dot-com era may help us avoid both tragedy and farce in the face of the next emerging opportunity — whether it be nanotechnology, green energy, globalization, or Internet Boom 2.0. Many of the lessons are counterintuitive, which may explain why his-



tory has indeed repeated itself all too often.

Too Few Failures

The 50 percent failure rate of the dot-com era still seems high, until we put it into perspective. Compare the dot-coms to other business realms: From 1996 to 1998, for example, the survival rate for independent restaurants open for three years ran 39 percent. That is, a form of business with a very measurable market, using cooking technology that has existed for decades or more, failed 61 percent of the time. By comparison, the failure rate of Internet-based businesses tapping unknowable market opportunities with an unproven technology platform seems far more tame.

Perhaps this data simply suggests that the dot-com era was an overall success. Despite the trillions

businesses in the long run.

As Kenichi Ohmae suggested in *The Invisible Continent: Four Strategic Imperatives of the New Economy* (HarperBusiness, 2000), the dot-com era was like the exploration boom that launched the United States' westward movement in the 18th and 19th centuries. The Internet opened up an entirely new continent for colonization. Many venture pioneers sought to settle this new land. Upon reflection, the fact that so many companies survived suggests that the first wave of the dot-com revolution suffered from too *little* entry, not too much. The hype-happy phase of the bubble created a land-grab mentality, with early entrants seeking to control the high ground rather than continue exploring. And, when the bubble burst, new explorers could not get the funding to start a new

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The first dot-com wave suffered from too *little* entry, not too much.

of dollars of market capitalization lost when the Internet bubble burst, maybe one should celebrate that the losses were not greater. But we disagree with this perspective. In fact, we bemoan the low failure rate.

To be clear, we do not wish that more startups had failed. Rather, to us, the low failure rate indicates that too few entrepreneurs were funded and too few new ventures launched. Had twice as many been launched, the short-term failure rate for individual businesses might have been higher, but a larger number of successful business models would probably have emerged, and these would have led to more enduring

expedition of the remaining uncharted territory. Had the fall not been so dramatic, more firms could have sought to productively exploit the new terrain.

First-Mover Fallacy

A key contributor to the land-rush mentality was the first-mover fallacy: a belief that the winners would be the ones who got there first and got big fast. Conventional wisdom argues that the first company to stake out a position will dominate its industry — especially during a rapid growth period like the early days of the Internet. But history has proven that the opposite is often

true: Commodore, Osborne, and Kaypro pioneered the personal computer industry in the early 1980s but did not establish dominant positions. Rigorous academic research has shown that early movers may achieve a market share advantage, but they do not systematically achieve greater profits or a higher survival rate.

A look at Internet retailing substantiates the idea that you don't have to be a first mover to succeed. Founded in 1994, Amazon is the clear leader in Internet sales, but it did not achieve full-year profitability until 2003. Although it remains marginally profitable today (4.2 percent net income for 2005), Amazon still has cumulative net income of negative \$2 billion. Another early "e-tailer," eToys, fared even worse. Founded in 1996, eToys went public in 1999 and declared bankruptcy in 2001. By contrast, Newegg, which sells new and used computer and electronic equipment, didn't launch until 2001 and is now the second-largest pure-play Internet retailer, with 2005 sales of \$1.3 billion.

First movers do not necessarily find the most fertile ground. Those who wait to explore later, or more patiently, benefit from the experiences of earlier settlers. They can bypass the hulking shells of unsustainable structures built by the first-generation pioneers and salvage the best ideas buried in the wreckage. Consider FreshDirect, the online grocer, which offers a direct delivery model much like that of Webvan. FreshDirect serves 250,000 customers in the greater New York City area from a central distribution center in Queens, just outside midtown Manhattan. A privately held company with an estimated \$150 mil-

lion in annual sales, FreshDirect ranked 68th among American Internet retailers in 2005, and (according to *Forbes* magazine's September 18, 2006, issue) became profitable within the past year.

Unlike Webvan, which viewed the "last mile" as a golden opportunity and sought to be the first mover, FreshDirect took inspiration from Internet pioneer Dell. The founders sought to redesign the grocery supply chain, using a rapid-assembly "build-to-order" approach to provide fresher products at lower costs. They recognized that developing this capability would take time and focused experimentation. The company continues to patiently refine and expand its business from its Queens location rather than pursue rapid, unprofitable growth. When the model matures and the timing is right, FreshDirect is expected to expand beyond New York. But in the meantime, it happily pursues its niche in one of the largest grocery markets in the world. (See "Was There Too Little Entry During the Dot Com Era?" by Brent D. Goldfarb, David Kirsch, and David A. Miller, Robert H. Smith School of Business research paper no. RHS-06-029, April 24, 2006, <http://ssrn.com/abstract=899100>.)

Overhyped Networks

During the early days of the New Economy, previous models of success were easily dismissed. Dot-com businesses were not supposed to operate by the same rules as traditional firms. The new calculus posited that the Internet generated "network effects," which made the first-mover strategy critical. The fate of early personal computer hardware companies was irrelevant; the example of

Microsoft setting the industry standard for PC operating systems offered a more relevant example. The pundits proclaimed that "network effects" would rule the new "network economy." Unfortunately, many investors learned that just because the Internet is a network doesn't mean it offers significant network effects to every business.

The phrase *network effects* — or its more formal economic equivalent, *network externalities* — refers to the phenomenon of a network's value increasing as more members join. Consider the network effects of Skype, the Internet communications company that enables free voice and video communications among its members. As each new member joins, the value increases for existing members because each member now has additional potential points of contact.

Bob Metcalfe, founder of The 3Com Corporation and developer of the Ethernet technology for networking computers, adapted the theory to technology businesses in what became known as Metcalfe's Law. He argued that the value of a network grows as the square of the number of users. (See "The Big, the Bad, and the Beautiful," by Tim Laseter, Martha Turner, and Ron Wilcox, *s+b*, Winter 2003.) Online auction mecca eBay, another company that clearly benefits from network effects, acquired Skype for \$2.6 billion in September 2005, when the company boasted 54 million users. A year later, the network had more than doubled to 113 million users spread across virtually every country in the world.

Intellectually appealing in its simplicity, Metcalfe's Law seemed to offer a justification for the astronomical valuation of early dot-coms

and provided a mandate to move first and get big fast. Simple insights generally prove more useful than complex theories. But simplistic application of a concept replaces critical thinking far too often. In the end, the value of a network effect depends on the business model. It obviously works for eBay: More individual buyers bring on more individual sellers who bring on more buyers in a virtuous circle. But a retailer of new products — using traditional stores or the Internet — doesn't experience this same network advantage.

Bigger Is Riskier

Independent of network effects, a “get big fast” strategy offers both benefits and risks. On the one hand, scale economies certainly accrue to a big company. Wal-Mart can buy and then transport goods at a lower cost because it sells more than \$300 billion in goods each year. In addition to having the resources to scour the world in search of the lowest-cost suppliers, Wal-Mart can invest in state-of-the-art radio frequency identification (RFID) technology to run its distribution network. The distribution network has enough density for economical cross-docking operations, which transfer goods between trucks without the extra cost of storing them for long periods of time. As a result, Wal-Mart turns its inventory eight times per year versus a median of four times for the industry as a whole.

But a “get big fast” strategy in pursuit of scale economies has a dark side, especially in unpredictable markets. Webvan, for example, was founded in 1996, went public in 1999, and filed for bankruptcy protection in 2001. In the summer of 1999 it reported that revenues

from the six months ending in June totaled \$395,000, with net losses of \$35.1 million. Despite those financial results, the company signed a \$1 billion contract with Bechtel Corporation to build 26 distribution centers across the country, modeled on its unproven pilot operation in Oakland, Calif.

Webvan ultimately built three of the highly automated, large-scale distribution centers, and none of them reached break-even utilization levels. Each distribution center offered sales potential equivalent to 18 traditional grocery stores — a

complexity of a highly automated business model and uncertain demand. Even though the model might have proven advantageous over time — with more experimentation — the “get big fast” thinking created a risk profile that was simply too extreme.

The Herd Instinct

Why did so many companies try to be the first mover and pursue a “get big fast” strategy despite the questionable economic and strategic logic of that approach? Part of the blame clearly falls at the feet of the

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huge amount of capacity to bring online at one time in a mature industry. Webvan's projections had estimated costs based on high utilization rates; but at the 30 to 40 percent utilization rates actually achieved by the facilities, the company's costs were well above those of the traditional model, and its cash quickly dissipated.

By contrast, Wal-Mart achieved its scale over a very long time. Sam and Bud Walton opened the first Wal-Mart in 1962, but only after Sam had spent a dozen years running five-and-dime stores for the Ben Franklin chain. Eight years later, in 1970, Wal-Mart went public with \$44 million in sales from 18 stores. It also opened its first distribution center that year. Sam Walton expanded much more slowly and only after proving the profitability of the small-town discount store strategy. Webvan tried to grow rapidly while struggling with the

venture capitalists. Venture capitalists play a critical role in the economy by funding business ideas early in the life cycle when the risk of failure is high. By having a portfolio of such investments, venture-capital funds offer extraordinary returns even when only a small fraction of the businesses succeed. In normal times, venture-capital firms view thousands of ideas from passionate entrepreneurs, but generally fund just a handful of businesses each year. Furthermore, they parcel out the money gradually as the companies prove the viability of their business models.

But during the heady days of the dot-com era, the venture capitalists found themselves with a surfeit of money as more and more investors wanted a piece of the action. Although far more projects were chasing those funds than had been the case in past years, the venture-capital firms did not neces-

sarily have the resources to screen all of those ideas with consistent rigor. Since investors couldn't maintain their formerly high levels of fundamental due diligence at the faster pace of the bubble years, they began to make investment decisions by looking to the decisions of other venture investors. As with the buffalo on the prairie, a few leading examples charging off with abandon can create a stampede. And when no one knows with confidence where to go, the safest path is to follow the herd.

Sociologists have a fancy name for this herd instinct: mimetic isomorphism. They have documented

share rather than profits. But the venture capitalists — and then the capital markets — agreed to fund the massive investments and simultaneous losses. The only way to avoid the day of reckoning on profits was to continue promising more growth and seeking more money to fund it. Even before it went public, Webvan scored a \$1 billion market capitalization by promising exponential growth from a mere \$4 million in revenues — less than one-fourth of the annual sales of a single grocery store.

Although following the herd may appear rational in periods of high uncertainty whenever the herd

turns and heads in the opposite direction with equal abandon. When the dot-com craze reversed itself, millions of investors lost a large proportion of their retirement accounts. And more than 100,000 dot-com employees lost their jobs in the 10 months from October 2000 to July 2001. When bubbles pop, many people get hurt.

To avoid the bubble, we recommend lots of little experiments that send the herd in many different directions. Avoiding the “get big fast” strategy and the herd instinct allows for a more thorough investigation of the terrain. Many members of the herd will fall upon barren terrain and die, but in the long run, careful nurturing of the fruitful routes will produce a greater herd than overgrazing of the fertile patches discovered by the lucky few.

Who was the biggest employer of Harvard MBAs in 1982? A “hot” tech company called Atari.

its prevalence in industries as varied as trucking and banking. That research has also demonstrated the rationality of copying others. Although copying rarely produces a breakthrough outcome, it does keep an organization from being left behind. Only a brave buffalo goes against the stampede. And unless that buffalo is extremely agile, it may well be crushed by the herd.

Unfortunately, once the process of mimetic isomorphism gets started, it is hard to stop. The only way to get funding during the dot-com heyday was to identify a new market and promise exponential growth (à la Metcalfe's Law). That exponential growth required huge funds that siphoned money away from potential late starters who could learn from the initial failures. The “get big fast” strategy produced more losses as companies focused on market

dynamic is evident, there is reason to be wary that an opportunity has peaked. Jeffrey Immelt, CEO of GE, recently warned an auditorium of MBA students at the Darden Graduate School of Business to avoid the herd instinct; he cited his own experience upon exiting Harvard in 1982. He noted that he and only one other classmate joined the staid General Electric Company that year, just months after Jack Welch took the helm and launched what would become a phenomenal 20-year period of growth. What was the biggest employer of Harvard MBAs in 1982? A “hot” technology company called Atari; it took on 17 graduates. (By 2002, of course, when Welch retired, Atari was long dissolved, its brand name sold to Hasbro Interactive.)

The biggest risk of the herd instinct comes when the stampede

More Bubbles Ahead?

There's already evidence that history will repeat itself, in the form of new business bubbles. Consider nanotechnology, the science of controlling materials and devices at a molecular scale. In March 2001, the National Science Foundation issued a report forecasting a nanotechnology market of \$1 trillion by 2015. Products already employing nanotechnology include stain- and wrinkle-resistant fabric, digital cameras, and tennis equipment. Could nanotechnology produce another bubble economy with overhyped expectations followed by a painful correction? A recent report identified more than 800 companies involved in nanotechnology, including many public companies. Does that figure represent enough experimentation for a market estimated to grow at 44 percent per year for the next dozen years?

Renewable (“green,” or non-fossil-fuel-based) energy represents another example of promising but unknowable market potential that would benefit from lots of experimentation. In 2000, Clean Energy Incorporated forecast a market of \$23 billion by 2005; the actual market was \$24.2 billion. Although reasonably accurate overall, the forecasts overestimated the potential for fuel cells by a factor of two while significantly underestimating the potential for solar energy. Current forecasts are for nearly fivefold growth over the next decade, but the question remains: Will the growth come from fuel cells, solar devices, wind energy, or other new forms of renewable energy? Given such uncertainty, lots of little bets are likely the best course.

The phenomenal growth in business process outsourcing (BPO) and offshoring may be the latest example of a herd already in a stampede. The International Data Corporation estimated the 2005 BPO market at \$627 billion, growing from a market of \$60 billion seven years ago. India, a country with a GDP of just over \$500 billion, “exported” \$16.1 billion in IT services and \$5.1 billion in BPO services in 2006, according to Plunkett Research Ltd. The cost savings potential from outsourcing and offshoring clearly warrants serious managerial attention, but how many of these decisions reflect a herd mentality rather than serious consideration of the long-term strategic implications? The worldwide market for offshored research and engineering services now tops \$18 billion. Can the developed world afford to give up critical competencies in intellectual property creation? Can businesses afford not

to tap into the intellectual resources available from developing countries? One thing is certain: The best results will come from serious reflection and experimentation that challenges our assumptions, not from simply following the herd.

Finally, the market for RFID tags plus the supporting systems and services totaled \$2.7 billion in 2006, and forecasts predict growth to \$26.2 billion over the coming decade. Since the invention of the technology, nearly 2.4 billion RFID tags have been sold across a wide range of industries. But few people realize that the invention dates back to 1944. Many small bets with a mix of successes and failures have occurred during the intervening years. Wal-Mart’s commitment to RFID technology may now produce the tipping point that triggers widespread adoption. This could lead to bigger bets going forward. At the same time, 62 years of exploration have already identified the most fertile terrain, and the competitive gains from RFID may not be as massive as many observers predict.

Test All Assumptions

Karl Popper, a leading scientific philosopher of the 20th century, argued for challenging conventional wisdom: “By criticizing our theories, we can let our theories die in our stead.” A new business venture is a theory tested in the real world. We should test many such hypotheses, but we should also test our assumptions even before we let the market prove or disprove our business theory. In the dot-com heyday, smaller bets would have given more insight into how to bet more wisely the next time, and the munificent capital of that era might not have been squandered so much. Proving

that something does not work — falsifying a hypothesis — can be even more valuable than finding supporting evidence. Popper also noted that “no matter how many instances of white swans we may have observed, this does not justify the conclusion that *all* swans are white.”

During the dot-com bubble, large sums of money went toward big bets on first movers intent on getting big fast. Observing some big successes in businesses with network effects or scale economies, investors concluded that all of the swans were white. In reality there were also black swans — and a fair number of geese, ducks, and egrets as well. The market results — and societal results — would have been better had the capital been more patient and had it gone into a more diverse range of exploratory investments. Although more businesses would have failed, the failures would have been smaller and would have provided less costly lessons. Multiple smaller experiments would have generated far more insight into the real drivers of value creation on the Internet and produced more exploration of the undiscovered terrain.

Uncertain times abound; despite Marx’s claim of inevitability, business managers can avoid repeating the past. The dot-com era taught us that testing ideas with small bets and constantly challenging conventional wisdom offer the best path to finding the right market timing. Whatever the current uncertainties facing your market — nanotechnology, green energy, Indian and Chinese enterprise, or something else altogether — don’t allow your future to become tragic or farcical. History does not have to repeat itself. +

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