



**BY ZHU WANG, ECONOMIST**

**W**hat a difference a decade makes. When Security First Network Bank, the first Internet-only bank, started its service in 1995, online banking was a brand new concept that few consumers had ever heard of. Ten years later, online banking has become an indispensable part of average American life. Now, about 40 million U.S. households actively use their online bank accounts by checking balances, paying bills or transferring funds. The Internet has dramatically transformed consumers' banking experience.

However, implementing this banking innovation was not a smooth and painless process for the banking industry. The Internet-only banks that pioneered the

adoption and development of this new technology did not fare well despite their early success. Before 2000, about 50 dot-com banks had entered the industry and were generating great market value. However, as the graph on page 24 illustrates, by 2003, their stock price index dropped by 80 percent from the peak, and nearly half of them exited, either by being sold, closed or declaring bankruptcy.

### **Motivation**

The shakeout of Internet-only banks was not at all an isolated phenomenon, but part of a broader picture of the dot-com boom/bust cycle. As Internet technology became commercially available in the middle of the 1990s, a huge

wave of dot-com firms that conducted their business exclusively online entered the market. During a short period in the late 1990s, about 7,000 to 10,000 new substantial dot-com companies were established. However, by 2003, nearly 5,000 of them exited, of which about 4,000 were sold and 1,000 closed or declared bankruptcy. From peak to bottom, the Dow Jones Internet stock index plummeted by 93 percent and the Nasdaq composite lost 78 percent of its value.

What can explain the striking market turbulence of dot-coms in general and the shakeout of dot-com banks, specifically? It might be tempting to suggest market irrationality—a financial bubble. But even if a bubble did exist, it still remains a mystery what changes of real fundamentals, if any, could have induced the bubble to form and burst in the first place. Finding a deeper answer to this question may provide insight to industry executives in dealing with technology innovation and market turbulence in the future.

### The trajectory of innovation

To better understand the rise and fall of dot-coms, the key is to look into the nature of Internet innovation and the resulting dynamic competition among firms of different types in the market, in particular, online pure-plays, firms that do business purely on the Internet, versus traditional brick-and-mortar firms.

It may be hypothesized that when the Internet initially arrived, new dot-com firms found it profitable to enter the market to compete with the incumbent brick-and-mortar firms. Their entry was especially facilitated by the lower entry cost associated with the online technology. That may explain the early entry and early success of dot-coms.

However, the incumbent firms also had the option to get online. If the Internet turned out to be complementary to existing brick-and-mortar technology, the dot-coms would eventually lose their advantage. That may explain the dot-coms' later exits.

Moreover, it took time for Internet innovation to diffuse among incumbent firms. Before many brick-and-mortar firms could successfully

turn themselves into click-and-mortar, there was room for dot-coms to thrive. However, as more and more incumbents went online, less and less room was left for dot-coms to survive. That may explain why the shakeout eventually started.

During this dynamic process of industry evolution, the share of online sales to total sales kept rising, while the share of dot-coms kept falling.

In the early days of e-commerce, the market was excited about the potential competitive advantages that Internet firms had over traditional ones. By eliminating its physical operations, the pure-plays could lower substantially the cost of entry into the market. Internet firms enjoyed further advantages, including access to wider markets, lower inventory costs, ability to bypass intermediaries, lower menu costs enabling more rapid response to market changes, ease of bundling complementary products, ease of offering 24/7 access, and so on.

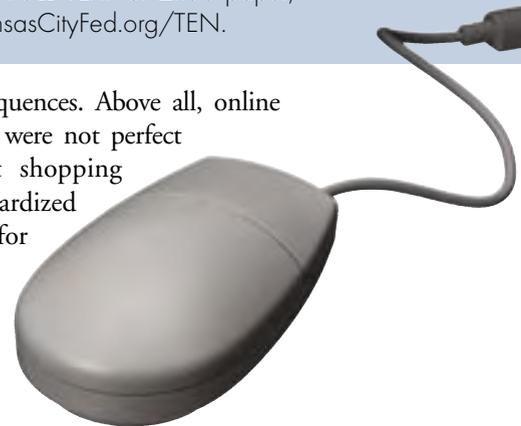
However, the market experienced that eschewing physical space for cyberspace did not

## FURTHER RESEARCH

Zhu Wang's full paper, "Technology Innovation and Market Turbulence: A Dot-com Example" explains market turbulence as industry dynamics triggered by technology innovation. When a major technology innovation arrives, a wave of new firms implement the innovation and enter the market. If the innovation complements existing technology, some new entrants will be forced out as incumbent firms adopt the innovation. It is shown that the diffusion of Internet technology among traditional brick-and-mortar firms is indeed the driving force behind the rise and fall of dot-coms and the growth of e-commerce.

TO READ THE FULL TEXT of Zhu's paper, go to [www.KansasCityFed.org/TEN](http://www.KansasCityFed.org/TEN).

come without consequences. Above all, online and offline channels were not perfect substitutes. Internet shopping fits better with standardized goods and services, for instance, buying books, which do



not require personal contact with the item or a large physical shopping space. Conversely, it fits less well for the category of “experience” goods and services, such as clothing, where customers need first-hand experience with the item. Also, Internet firms incur extra costs by running high-tech systems that require a more expensive labor force and by offering additional physical delivery channels.

Most important, click-and-mortar firms create a multichannel enterprise that is greater than the sum of the individual channels because they have great sources of synergy across the online and offline channels. The sources include common infrastructures, common operations, common marketing, and common customers.

An example of the use of a common infrastructure is when a firm relies on the same

others that can enable them to take better advantage of an innovation like e-commerce.

Eventually, traditional firms were able to capitalize on these synergies between their existing and new online service delivery channels to beat the dot-coms at their own game.

## Banking on dot-coms

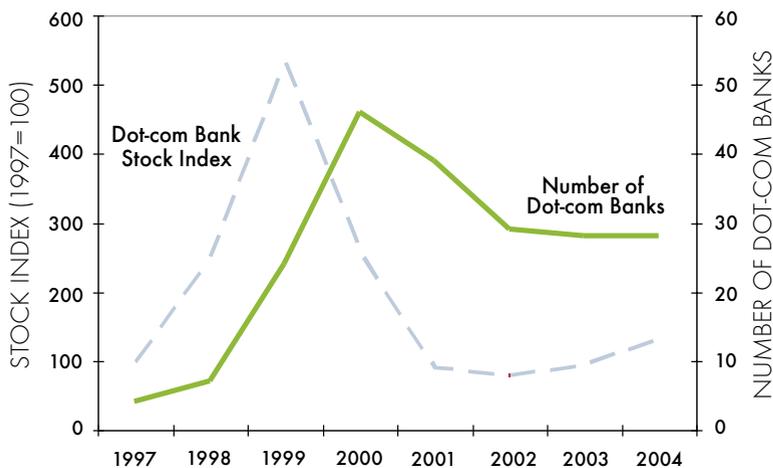
As suggested, the key to explaining the dot-com shakeout in the banking industry is to compare the competitive positions of pure Internet banks against their competitors with brick-and-mortar branches. Similar to other e-commerce industries, the core strategy of an Internet-only banking model is to reduce overhead expenses by eliminating the physical branch channel. However, it turns out that the online channel is not a perfect substitute for the

branch channel, but rather, a good complement. The number of ATMs or brick-and-mortar offices per bank actually has been increasing since the mid-1990s, together with the increasing adoption of online banking.

Exploring the synergy between online and offline channels reveals that a click-and-mortar bank typically delivers standardized, low-value-added transactions such as bill payments, balance inquiries, account transfers and credit card lending through the inexpensive Internet channel, while delivering specialized, high-value-added transactions such as small business lending, personal trust services and investment banking through the more expensive branch channel. By providing more service options to its customers, a click-and-mortar bank is able to retain its most profitable customers and generate more revenue from cross-selling.

A study by the Federal Reserve Bank of Chicago compared the performance between Internet-only full-service banks and their branching counterparts from 1997 to 2001. The results show that Internet-only banks, on average, had a lower asset return. That is because of their lower interest margins and fee income, lower levels of loan and deposit generation, lower business loans, and higher noninterest expense

## STOCK INDEX AND NUMBER OF DOT-COM BANKS



logistics system or shares the same IT infrastructure for both online and offline sales. An order processing system shared between e-commerce and physical channels is a good example of a common operation. This can enable, for example, improved tracking of customers’ movements.

These various synergy sources are represented in the many forms of complementary assets that click-and-mortar firms possess, such as existing supplier and distributor relationships, experience in the market, a customer base, and

on equipment and skilled labor.

As more and more banks go online, the competitive pressure in the online banking market has surely increased. According to data collected by federal banking regulators, 75 percent of depository institutions have adopted a website in 2004 compared to 35 percent in 1999, and 60 percent reported websites with transaction capability in 2004 compared to 37 percent in 2000. Even more important, the online technology gap between Internet banks and traditional banks also has been closing. Based on the research conducted by GomexPro, six Internet banks ranked among the top ten for the "Best Online Banking Service" in 1999, but the number dropped to two in 2001, then to one in 2003.

Consequently, online-only banks have lost market share to their multichannel competitors. As the table to the right reveals, the number of unique visitors to multichannel banks climbed from 6.4 million in July 2000 to 13.4 million in July 2001, while the traffic to online-only banks fell from 1.2 million to 1.1 million. In the meantime, the shakeout of online-only banks started in 2000, with the number declining from around 50 in 2000 to less than 30 in 2003.

Security First Network Bank, the first dot-com bank, was one of the casualties. Acquired by Royal Bank of Canada in 1998, its Internet operations were discontinued in 2002, and Internet transaction accounts were sold to RBC Centura Bank. Other dot-com survivors have generally adjusted their strategies, trying to avoid head-on competition with big click-and-mortars. For example, ING Direct, the largest dot-com bank today, offers services on saving accounts but not checking, and encourages their customers to keep their old bank accounts.

## Final thoughts

As discussed, the dot-com shakeout can be explained as equilibrium industry dynamics triggered by the Internet innovation that is complementary to the old brick-and-mortar technology.

## TRAFFIC TO BANKING SITES HOME & WORK USERS

	July 2000	July 2001	% Change
<b>Total Websites</b>	76.9 million	92.2 million	19.8%
<b>Banking Sites</b>	10.4 million	18.5 million	77.6%
<b>Multichannel Banking</b>	6.4 million	13.4 million	110.5%
<b>Online-Only Banking</b>	1.2 million	1.1 million	-8.1%
<b>MULTICHANNEL BANKS</b>			
<b>Chase</b>	957,000	3.7 million	281.1%
<b>Wells Fargo</b>	2 million	3.5 million	74%
<b>Citibank</b>	1.7 million	3.5 million	101.9%
<b>Bank of America</b>	1.5 million	3.3 million	119.4%
<b>Bank One</b>	536,000	1.1 million	112.5%
<b>Fleet</b>	501,000	900,000	79.6%
<b>ONLINE-ONLY BANKS</b>			
<b>Netbank</b>	688,000	461,000	-33%
<b>Juniper</b>	N/A	382,000	N/A
<b>E*Trade Bank</b>	359,000	238,000	-33.7%
<b>Wingspan Bank</b>	282,000	closed	N/A
<b>SOURCE: Juniper Media Metrix</b>			

In a market impacted by a significant technology innovation, the shakeout of new entrants tends to occur if the following conditions are met: (1) the innovation creates some advantages for pure-play entrants (e.g. low entry cost and/or low operation cost); (2) the innovation is complementary to existing technology; and (3) it takes time for the innovation to diffuse among incumbents using traditional technology.

Empirical evidence reveals that those are indeed the features of e-commerce in general and online banking in specific. Therefore, the dot-com shakeout would occur even without any market uncertainty or irrationality, though those factors also probably played a role in this process.

Nowadays, consumers may see how seamlessly the Internet has integrated itself into the economy, but they may also want to give some thought to how market forces have found their way through the turbulence to make all this happen.

Senior writer Toni Lapp contributed to this report.

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**COMMENTS/QUESTIONS** are welcome and should be sent to [teneditors@kc.frb.org](mailto:teneditors@kc.frb.org).