

# How Fast Will Banks Adopt New Technology This Time?

By Drew Dahl, Andrew Meyer and Neil Wiggins

New technologies that support financial services—technologies commonly referred to as “fintech”—are expected to change the face of the banking industry. Fintech experts predict that banks of the future will offer elaborate social network platforms, enable customers to use mobile phones to identify investment opportunities and “run almost entirely” on algorithms and robots.<sup>1</sup>

Many banks will get to this future sooner, others will get there later and some may never get there at all. This implies that the customers of some banks will be left behind, at least temporarily, in accessing technological innovations that are readily available elsewhere. Who are they?

We offer insight into this question of what *might* happen with respect to the introduction of new technologies by looking back at what *did* happen following introduction of an earlier technology: bank websites. If the past is prologue, this may foretell how technological innovations in banking will be diffused in the future.

## Background

In 1999, many people still had fresh in their minds memories of savings account ledgers, passed back and forth between depositor and teller. The majority of American households did not have access to the Internet. And, for the first time, banks were required to identify, in reporting forms filed with regulatory agencies, whether they had a Uniform Resource Locator (URL)—a tacit acknowledgement of the arrival of a new technology. From 1999 to 2016, the percentage of banks with URLs increased from less than 35 percent to nearly 100 percent.

Although it is beyond the scope of this paper to identify costs and benefits of

establishing a URL in 1999, we assume that the former were sufficient to discourage immediate adoption by some banks and that the latter were sufficient to encourage eventual adoption by almost all banks.<sup>2</sup> We hypothesize, in particular, that the balance of costs and benefits was impacted by a bank’s size and geographic location.

With respect to size, economies of scale in the provision of financial services suggest that larger banks adopt new technologies more quickly. To the extent that establishing a website has a fixed cost component, bigger banks can more easily accommodate it.

With respect to geography, websites lag in rural areas, and there appear to be many possible reasons as to why. Perhaps most important is limited Internet access for people living outside cities; in 2000, less than 32 percent of rural households had Internet access, compared with nearly 44 percent in urban households.<sup>3</sup> Rural banks also may have fewer employees with the expertise necessary to provide technological services and fewer customers interested in them. Not everybody wants to chat on chat boxes, access personalized financial services based on artificial intelligence, be recognized by Alexa or apply for loans as if playing a video game.

## URL Adoption in the Early 2000s

We identified 8,522 commercial banks in existence in 1999 (and for which information on assets and geographic location was available). Of these banks, 3,035, or 36 percent, reported a URL (Table 1), while the remaining 5,487 did not.

Early adopters were larger, with mean assets of \$1.5 billion, compared with those that had not adopted at that time, with mean

**TABLE 1**  
**URLs at Banks in 1999**

	Available	Unavailable
Number	3,035	5,487
Average Assets	\$1,510	\$202
Percentage Urban	58%	42%

SOURCE: Call Reports of Condition and Income (Call Reports) that are filed with regulators and published by the Federal Financial Institutions Examination Council.

NOTES: “Available” indicates banks that reported a URL, and “Unavailable” indicates banks that did not. Dollar amounts are expressed in millions.

assets of \$202 million. Banks located in urban areas inside metropolitan statistical areas (MSAs) accounted in 1999 for nearly 60 percent of banks that had adopted URLs but less than 40 percent of banks that did not.

Of the banks that did not offer URLs in 1999, 4,673 of them subsequently reported URLs or, alternatively, existed continually through 2016 without ever reporting one. These banks comprise the sample for which we examine time to adoption (Table 2). The remaining banks either merged out of existence or were closed before reporting a URL.

Banks introduced URLs relatively quickly, with a majority having done so by 2001. But even in 2016, a handful of laggards reported URLs for the first time. Only 98 banks never reported a URL. These banks, moreover, were characterized by apparent reporting anomalies that obscured website availability; some affiliated banks, for example, did not report the existence of a URL even though their customers could access accounts online via their parent holding companies. It seems reasonable to assume near universality of URLs within the banking industry today.

**TABLE 2**  
**Adoptions of URLs by Year**

2000 1,144	2001 856	2002 424	2003 606
2004 359	2005 353	2006 240	2007 160
2008 137	2009 77	2010 58	2011 48
2012 31	2013 27	2014 34	2015 14
2016 7	Never 98		

SOURCE: Call Reports of Condition and Income (Call Reports) that are filed with regulators and published by the Federal Financial Institutions Examination Council.

Banks in rural areas were slower to adopt URLs than banks in urban areas, with the former averaging 4.94 years and the latter 3.18 years (first and second rows, Table 3). The difference of 1.76 years (second row) is statistically significant at the 1 percent level (as are all differences reported in this table).

The differences by geographic location persist regardless of whether banks are above or below a \$100 million asset threshold. Among banks in the smaller size category, the difference between urban and rural location is 1.67 years (sixth row), while the difference is 0.31 years for banks in the larger size category (eighth row). We conclude that the urban/rural divide is more pronounced among smaller banks.

Larger banks adopted URLs more quickly than smaller banks, 2.56 years versus 4.97 years (third and fourth rows), for a difference of 2.41 years (fourth row). For rural banks, the difference across size categories was 2.71 years (10th row), while for urban banks, the difference across size categories was 1.35 years (12th row)—smaller than in rural areas but still significant. Even in cities, bank size makes a difference in the diffusion of technology.

### The Adoption of Technologies Today

Factors that influenced the introduction of URLs in the early and mid-2000s may not be the same as those that will influence the spread of fintech services today. Incentives of banks to offer fintech services, for instance, may differ today in response to differences in customer demand or differences in the supply of services by competitors outside the banking industry. Widespread

access to the Internet makes a difference, of course: A customer of a small, rural bank that does not offer technological services can acquire them remotely, albeit with some additional dollar costs or inconveniences.

Nevertheless, a “bifurcation of banking between branch and digital based on geography,” as discussed by Grace Noto, a commentator on bank innovation, still persists.<sup>4</sup> Economies of scale, presumably, still play a role in product offerings. Internet usage continues to vary by geographic location, with 69 percent of the population of rural areas and 75 percent in urban areas using the Internet in 2015.<sup>5</sup> And small banks, as well as rural banks, remain disadvantaged in attracting technologically qualified employees and in obtaining technological expertise from third-party vendors at reasonable costs.<sup>6</sup>

To the extent that patterns in the adoption of URLs are representative of patterns of adoption of technologies today, our results suggest that customers of smaller and rural banks will be unable to access new technologies as quickly, or as efficiently, as customers of other banks. The customers at smaller and rural banks appear to be the ones who are more likely to be left behind, at least temporarily, as fintech options in banking expand.

Nearly 20 years ago, many banks and their customers weren’t interested in websites. Today, virtually all banks offer them. It remains to be seen if it will take another 20 years for some banks and their customers to catch up with today’s fintech. 

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### ENDNOTES

- 1 See Digits.
- 2 It is possible that the reporting requirement itself may have influenced bank adoption of URLs.
- 3 See U.S. Census Bureau.
- 4 See Noto.
- 5 See Carlson and Goss.
- 6 See Community Banking in the 21st Century.

### REFERENCES

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**TABLE 3**  
**Differences in Adoption Rates by Size and Geographic Location**

Bank Category	Number of Banks	Average Years to Adopt	Difference
Urban	1,731	3.18	
Rural	2,942	4.94	1.76
Smaller	3,350	4.97	
Larger	1,323	2.56	2.41
Smaller Urban	960	3.78	
Smaller Rural	2,390	5.45	1.67
Larger Rural	552	2.74	
Larger Urban	771	2.43	0.31
Smaller Rural	2,390	5.45	
Larger Rural	552	2.74	2.71
Smaller Urban	960	3.78	
Larger Urban	771	2.43	1.35

SOURCE: Author’s calculations based on Call Reports of Condition and Income (Call Reports) that are filed with regulators and published by the Federal Financial Institutions Examination Council.

NOTES: Smaller banks have assets less than \$100 million; larger banks have assets greater than \$100 million. All differences are statistically significant at the 1 percent level.