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# A Study on How Mobile Banking Has Affected the Banking Industry: Has Mobile Banking Improved Bank Performance?

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A Study on How Mobile Banking Has Affected the Banking Industry: Has Mobile  
Banking Improved Bank Performance?

By: Courtney Elizabeth Cleveland

A thesis submitted to the faculty of The University of Mississippi in partial fulfillment of  
the requirements of the Sally McDonnell Barksdale Honors College.

Oxford May 2016

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2016  
Courtney Elizabeth Cleveland  
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## ABSTRACT

COURTNEY ELIZABETH CLEVELAND: A Study on How Mobile Banking Has Affected the Banking Industry: Has Mobile Banking Improved Bank Performance?

(Under the direction of Ken Cyree)

This paper explores the effect of mobile banking on the banking industry. It further seeks to investigate if banks improve financial performance as well as customer conversion and retention due to mobile banking. The research sifts through early entries in mobile banking features, data transfer technology evolution along with hand-held mobile device advances. Population demographics are also reviewed to understand which segment is more inclined to use mobile banking applications, giving banks insights and analytics for focused advertising. Data security needs and bank personnel skills evaluation show a shift in personnel skill-set evolution from historical employees. Overall, the data suggests that bank performance does improve on the balance sheet and in customer conversion/retention when the bank has leading-edge mobile banking features along with disciplined cost reduction in front-line tellers and reduction in brick-and-mortar investments.

## ACKNOWLEDGEMENT

I would like to thank my advisor, Dean Cyree for his guidance and input on this thesis. His knowledge in the world of banking has been of great use and far supersedes mine. I also want to thank him for his patience in the task of writing a paper with me. I want to thank my second two readers, Dean Wilder and Dr. Hawley for their intriguing questions and edits. Thank you to the Sally McDonnell Barksdale Honors College for allowing me to be a student within their body for the past four years and learn from the great minds surrounding me. I also want to thank them for the opportunity to travel to Boston and begin my research for this thesis. Finally I want to thank my parents for encouraging me in everything I do and for the hours they spent helping me make sense of my thoughts.

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## **I. Introduction**

The landscape of banking is changing. Customer expectations are evolving and banks are looking for new ways to attract and satisfy profitable customers. I hypothesize that one way for banks to satisfy customers profitably is through mobile banking. Digital leaders in surrounding industries are pushing the banking industry to improve their digital performance. I explore the evolution of mobile banking within the banking industry and how it has affected change. In the instance of this thesis, mobile banking includes online websites, mobile apps, and SMS banking channels. The timeframe from the introduction of mobile banking and its growth thereafter to the current time or as data is available is the evaluation period. I explore what products or services are offered, why it appeals to customers, and what the bank gains by offering mobile banking. I also briefly explore the key influences or enablers on mobile banking and the impact of such. I hypothesize that mobile banking reduces costs for the bank, thereby improving their performance. Additionally, I investigate if the new banking delivery method shift customer behavior and becomes a required product offer just to compete.

To investigate my hypothesis, I have researched studies commissioned by the banking community regarding consumer behavior, read academic papers and publications, conversed with banking professionals in this field and academic leadership



about this subject matter. I have formed my own opinions from the dialogue and data that I have tested with my research and mentor group, allowing me to arrive at my own conclusions in which I will share through this writing. I will first discuss the applicable literature, the history of the market and opportunities for mobile banking, the effects on the banking industry, and finally my conclusions.

## **II. Literature Review**

I have researched and read a variety of sources to bring a broad perspective to this thesis. Opinion pieces, such as the Wall Street Journal or The Financial Brand, offer professional spotlights on customer thoughts regarding mobile banking and the direction in which it is headed. Studies by consulting groups like Accenture and Javelin Strategy & Research and bank surveys offer valid and timely data on the trends and past performance of mobile banking. Academic papers provide prior research in related fields and offer their conclusions. All references in this paper have been of great value and have stirred my own conclusions about mobile banking and the role it plays in the industry today.

The Federal Reserve conducted research about mobile banking that was helpful in understanding the trends occurring in this industry. They summarized rising adoption rates and the fact that growth in mobile banking has followed the same pattern as growth in smart phone usage. The study depicts banking activities that customers use on mobile apps the most. They also highlighted the customer concern of security when choosing to adopt mobile banking.

A paper by Robert DeYoung featured in the Journal of Banking and Finance finds that Internet banking, a predecessor to mobile banking, does help community banks to improve their profitability. He also found that there was a movement from checking

accounts and demand deposit accounts to money market deposit accounts associated with the growth of Internet banking.

Ram Acharya noted in his paper, based on online banking applications and bank performance, that banks with a wider mix of products and ways to access them have better profit efficiency. His research concluded that banks would have to continue offering digital delivery channels to stay competitive.

Bank of America recently started conducting an annual millennial snapshot survey to measure the impact of this tech-savvy generation on the banking industry as they move into their prime spending years. They concluded that technology is a strong driver in money management (Bank of America, 2015).

### **III. History of Mobile Banking**

Mobile banking was first introduced in the late 90s-early 2000s when the Internet began to gain popularity. A few select large banks like Wachovia and Wells Fargo started to offer simple services on their bank websites such as viewing checking account balances and finding the nearest ATM, yet they did not offer interactive services. At this point in time, it was unclear as to what the evolution would be, but many thought that it may be limited to personal computers with much less thought of laptops, notebooks, smart phones or even wrist watch technology that are prevalent today. Smart phones were far from concept then, where as they are widely used today, which has proven to be a driver of mobile banking growth. Needless to say, mobile banking in its infancy did not thrive in the early days for several reasons in addition to the above reasons.

Bank websites were accessed through non-user-friendly web browsers and were difficult to use. Poor functionality, slow screen refresh speed and a limited quantity of features contributed to why customers did not readily adopt banking channels beyond physical branches and ATMs. Costly web hosting and website design services and the inability to revise or refresh the functionality made it difficult, or more importantly risky, for the banking industry to move key service offerings to the web-based channel. Security in banking was and is always a fundamental concern. This foundational element

was thought to be a key challenge to offering services beyond just read-only, non-interactive offerings.

Profitability and investor performance were key aspects to evaluate by both commercial banks and investment banks when investing in mobile banking technology. It was unclear in the early days how current or concept mobile services would interact with the existing offerings, and the employee base, as well as support the bank brands that had been built on personal customer service.

#### **IV. Mobile Banking versus Mobile Payments**

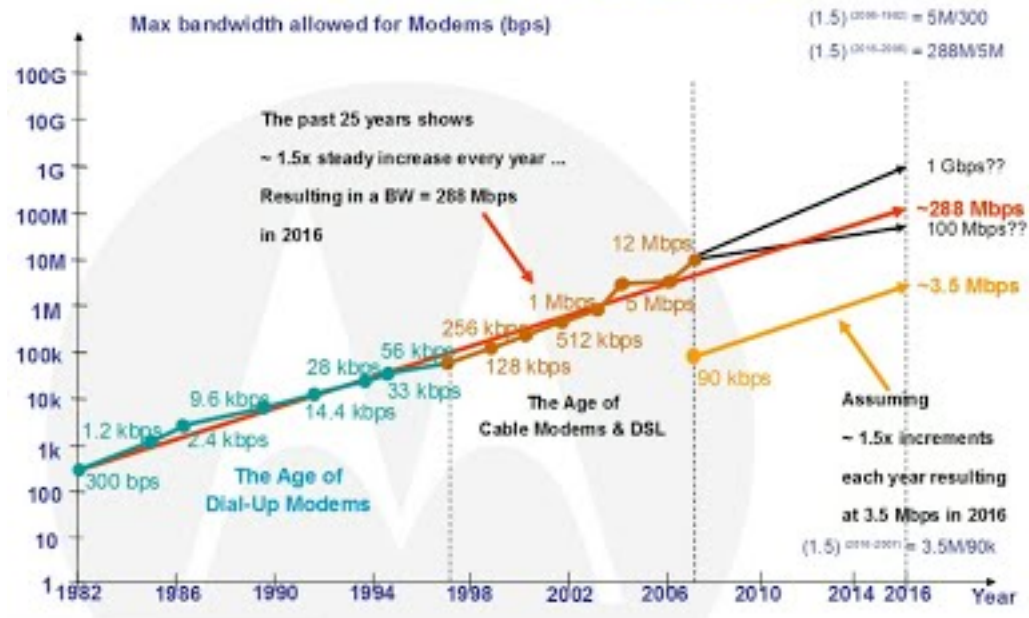
Mobile payment services preceded mobile banking and were widely accepted by merchants and consumers alike. Mobile payments are either person-to-person payments from a phone or person-to-merchant point of sale payments from a phone. An early form of use saw dial-up technology used from merchant facilities to banks or bank clearing houses to make immediate credit card transactions. The dial-up technology was slow and limited to few simultaneous users. Often multiple attempts were needed to complete the transaction, which could frustrate both merchants and consumers. Over time the evolution of Internet services and telephone company technology, including the deployment of fiber-optic cables and wireless technology, started a more robust expansion of this early use.

Mobile banking is using a cellular phone or smart phone to access bank accounts and perform accounting features. It also includes accessing other features of bank websites such as loan applications and interactive investment banking data to mention a few. Over the course of a couple years, the two streams of use converged through one application (app), and by using the same encompassing technology, sharply expanded the combine feature use. (Canright, 2012).

## **V. Change in Technology**

The evolution of several technologies thrust mobile banking into mainstream use. The rapid changes in telephone transmission, from copper wires to fiber-optic cables to wireless broadband and its expanded bandwidth, have allowed platforms to expand and in some cases re-launch mobile banking. It is not the intent to develop the details of this telephone evolution in this writing, yet it is important to note the impact of this evolution on mobile banking. If not for these new technologies, mobile banking may have floundered with limited features and mediocre reception. Data can be viewed in Table 1.

# 25 Years of Bandwidth



Source: Innova Global Technology Inc. (2016) [The graph shows a representation of bandwidth growth over the past 25 years.] *25 Years of Bandwidth*. Retrieved from <http://www.innovaglobal.com/cat-3-cat5-cat-5e-cat-5e-cat-6-cat-7-copper-fiber-optic-cable-infrastructure-installation>

With the advancement of wire and wireless technologies, banks had to adapt as well. When they first rolled out mobile banking, they used technology called WAP, or wireless application protocol, browsers. These are standard formats for digital programs. Some banks started making their own apps from the start, which is now the more common trend. Some banks offered different apps for different features. For example, account balance checking, finding nearby ATMs/branches, or transferring funds could be done in one app and more sophisticated services like personal financial management



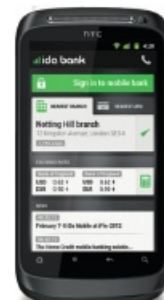
(PFM) could be done from a second app. Eventually, the services merged into one user-friendly app to save customers from “mobile fatigue.” It is also important to note another industry advancement and that is the evolution of personal computing programs in the windows technology and onward to the mobile device application (app) development (Johnson, 2011).

This is reflected in Table 2, the mobile banking overview by ida Mobile in the June 14, 2012 presentation given by Lorenzo Bolognini.

## A short history of mobile banking

- SMS Banking
- WAP Banking
- Mobile Internet Banking
- Mobile banking apps

CITI <space> BAL <space>  
Last 8 digits of your  
ATM number <space>  
MPIN to 2201

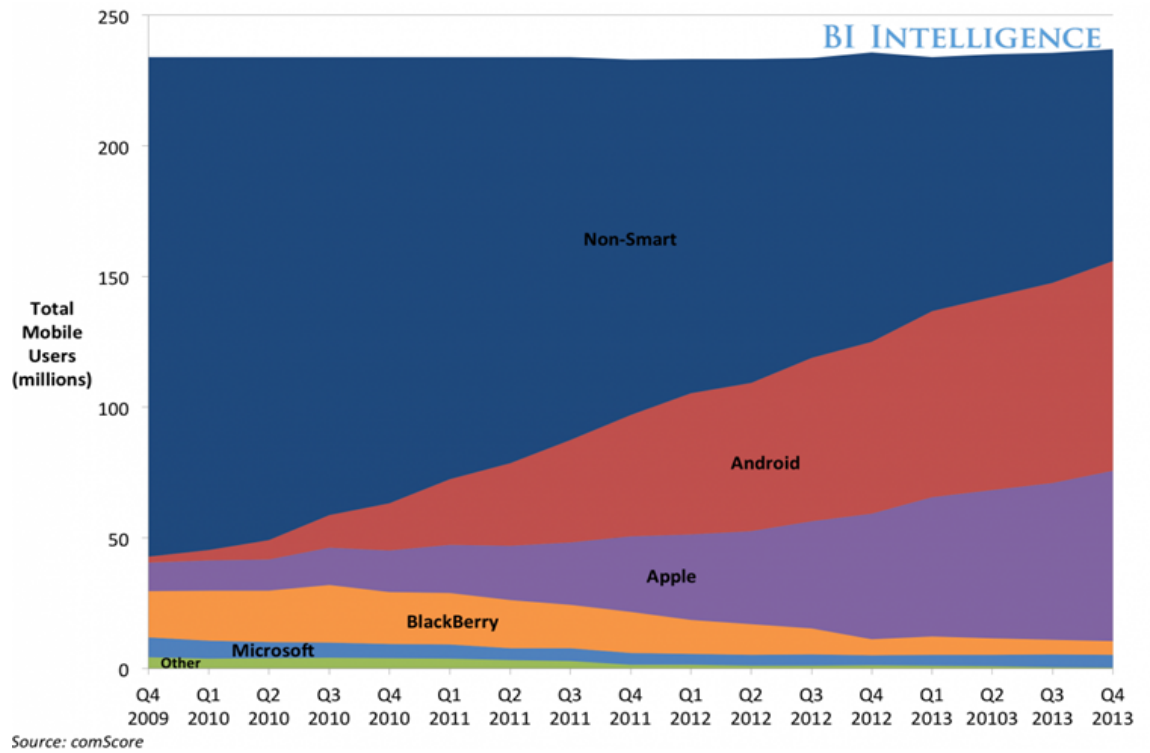


ida mobile

Source: iDa Mobile. [The visual conveys the four main types of technology behind mobile banking.] *A short history of mobile banking*. Retrieved from <http://pt.slideshare.net/lbolognini/mobile-money-13321960>

Table 3 reflects the sharp growth in app development that has been adopted by consumers. Regardless of the type of mobile technology (i.e., android, Apple, etc.), consumer demand for applications or app use was seeing an exponential growth. The functionality of these apps was becoming more user-friendly while the depths of services were expanded across all industries. Specific to banking, these apps were bringing the full array of brick-and-mortar banking onto a mobile device. Web and application designers were launching technology that was being acquired, utilized, and marketed by large and small institutions including the banking community. The point to be made from this chart is that banking institutions were enjoying the benefits of the explosion of app development by independent and corporate developers alike. It gave the banks an opportunity to select from the many options that would fit their brand and product profile.

## U.S. Mobile Market Share by Platform



Source: ComScore (2014). [The graph shows the growth of several different mobile platforms and their market share.] *U.S. Mobile Market Share by Platform*.

[PowerPoint slides] Retrieved from Paul Wiggins of Jack Henry and Associates

I submit that the growth in data transmission technology, mobile devices and app development were instrumental in the growth of mobile banking.

## **VI. Growth in Users**

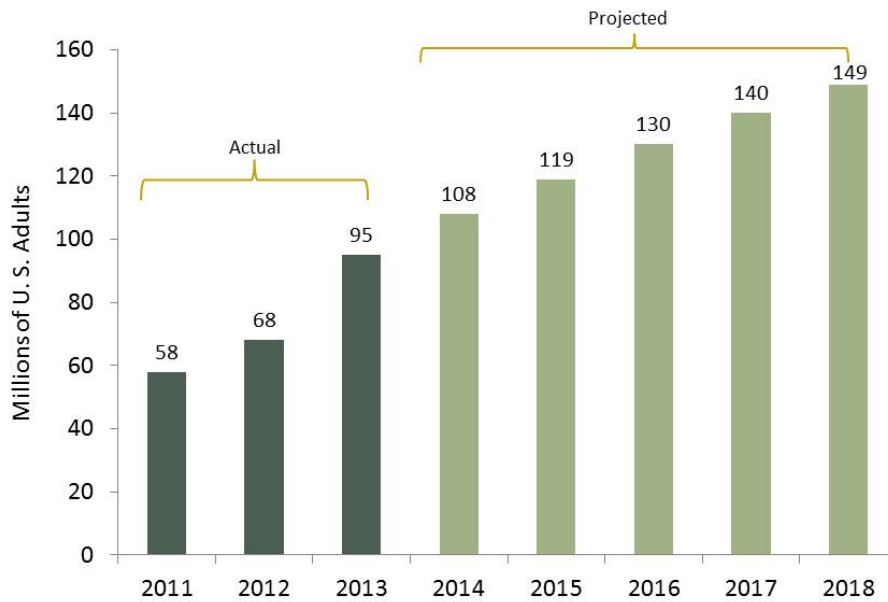
As the technologies improved in data transmission and app development, mobile banking made a second entrance around 2009 and has seen steady increases each year in banking institutions offering mobile services. In 2014, 78% of financial institutions offered mobile banking (Board of Governors of the Federal Reserve, 2015). The question that many banks had to answer in this season of re-launch was to what degree they would offer services? Would the mobile service offering be the cost of entry or could it become a competitive advantage? It became evident very quickly that banks had to offer more advanced services just to compete for the business of consumers. The industry even began to see online/mobile-only banks enter the market, validating the need to have mobile services even if you were a brick-and-mortar emphasized organization.

As it relates to user adoption, the Javelin Strategy & Research Group reports a strong growth curve beginning in 2011 and a sharp increase in 2013. Their projections suggest a fairly linear growth year-on-year through 2018. It also suggests that if you extrapolate the data from 2013 to 2018, the number of adult users will be approaching 150 million. Refer to Table 4.

## Mobile Banking Adoption Increased by 40% in 2013

(percent of U.S. adults using mobile banking in past 12 months)

©2014 Javelin Strategy & Research



Source: Javelin Strategy and Research (2014). [The bar graph depicts the growth in

mobile banking adoption by adults in the U.S. from 2011 to 2019.] *Mobile*

*Banking Adoption Increased 40% in 2013*. Retrieved from

<https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=8&ved=0ahUKEwjAoL78qczMAhWHMyYKHYGGBKEQFghJMAc&url=https%3A%2F%2Fwww.javelinstrategy.com%2Ffile%2F19721%2Fdownload%3Ftoken%3DpkjQISMH&usg=AFQjCNFVRxFxEZISbHNbpBBzDFPWFuX7tw&bvm=bv.121421273,d.eWE>

## **VII. Growth in Smart Phones**

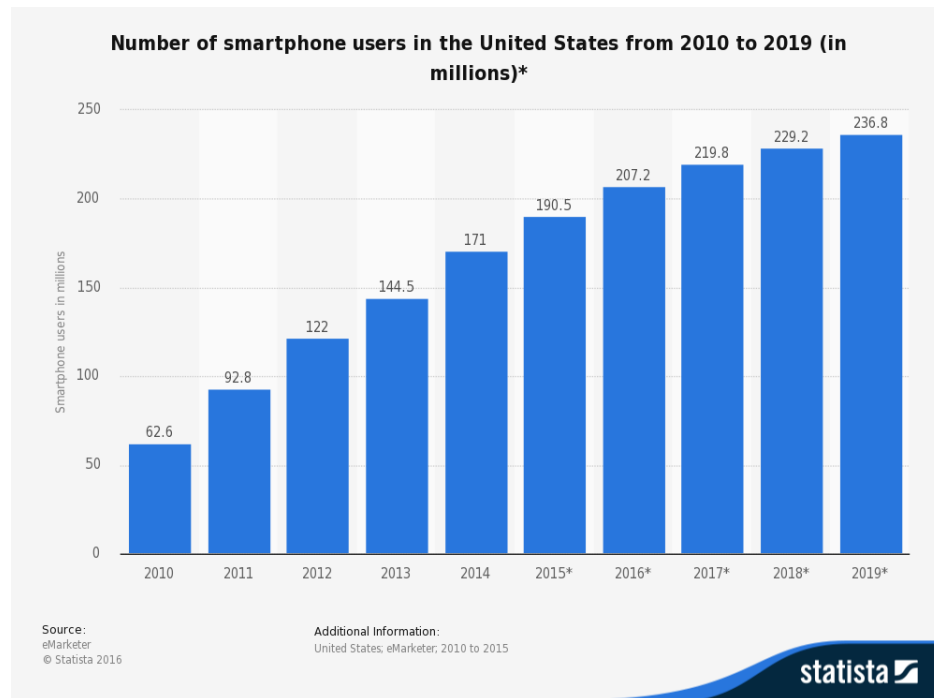
As the data transmission industry evolved, mobile technology followed suit by taking advantage of this newfound bandwidth. The introductions of the iPhone and other smart phones with similar platforms have been a steady factor in the growth of mobile banking. Smart phones have digitized many everyday tasks for Americans. The efficiency it brings to everyday tasks allows many Americans to regain valuable time spent in commuting and engaging in brick-and-mortar banking.

Some age groups adapt quicker to a digital experience, like Gen. X and Y, or millennials. These groups are an integral part of growing mobile banking because they are poised to become core-banking customers in the near future. They also make up the largest generation in the U.S. population. Individuals that fall within these generation lines will begin to become employed, look for loans, buy homes, start families, etc. They are not quite at that stage yet because of factors like student debt and a poor job market, but their affinity for anything digital will be of great importance when choosing how they want to bank. Their use of banks will become a determining factor in bank performance.

The U.S. Chamber of Commerce estimates the millennials' economic impact to be \$200 billion of direct purchasing power and \$500 billion of indirect spending. Their

research also found that “Millennials are 2.5 times more likely to be early adopters of technology than are older generations” (U.S. Chamber of Commerce Foundation, 2016).

A study from Javelin Strategy & Research, quoted by Maria Aspan, states that mobile banking customers “tend to be younger and richer than the typical consumer” and “45% have at least \$50,000 in investible assets with their banks” (Aspan, 2013). On top of that, 43% of mobile banking customers have an annual salary of at least \$75,000. With this target clientele, the banks must continue to offer more features to bring new customers into their brand and hold or advance their market share. Table 5 below shows almost the same growth curve that mobile banking customers’ adoption reflects.



Source: Statista (2016). [The bar graph shows the growth in adult smartphone users in the United States.] *Number of smartphone users in the United States from 2010 to 2019*. Retrieved from <http://www.statista.com/statistics/201182/forecast-of-smartphone-users-in-the-us/>

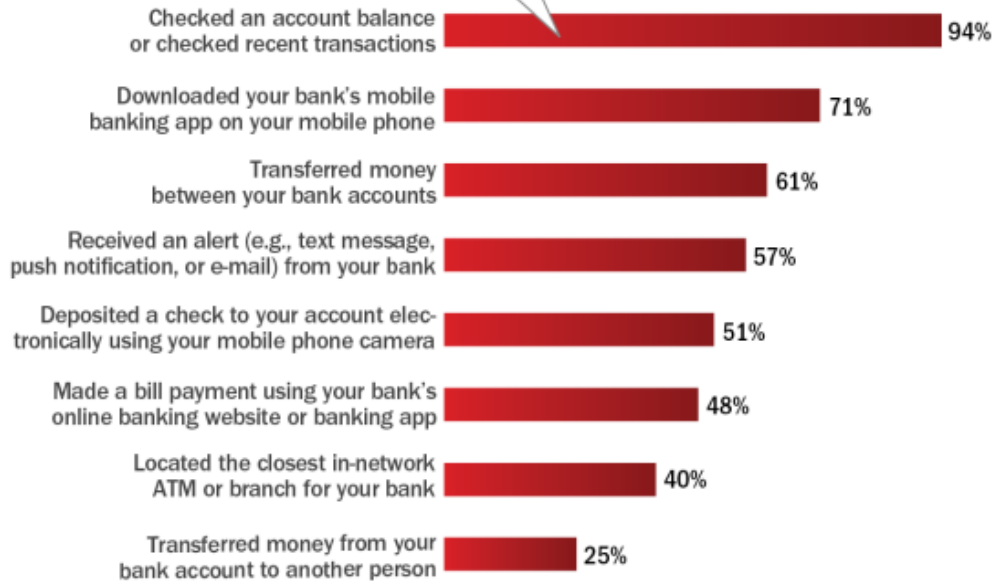
## **VIII. Current State of Mobile Banking**

A study by five of the Federal Reserve Banks states that 78% of banks already offer mobile banking, 16% plan to offer it within the next year, and 4% do not plan to offer it all. The data suggests that having mobile banking as a primary channel offering is really part of the price of entry into the commercial banking world. Having and evolving mobile banking features will be required to maintain relevance (Board of Governors of the Federal Reserve, 2015).

The research from the Federal Reserve is reflected in Table 6, which summarizes the usage of key mobile banking activities.



## Most common mobile banking activities



Note: The number of respondents who were mobile banking users was 829.

Source: Federal Reserve © March 2015 The Financial Brand

Source: Marous, J. (2015, August 10). Mobile Banking Usage to Double. Retrieved March 08, 2016, from <http://thefinancialbrand.com/53431/global-mobile-banking-usage-study/>

Banking executives and their analytical talent pool have to deploy unconventional skills in tracking technology changes to ensure their bottom line is sound. Once upon a time, the balance sheet, 10K and annual report really focused on the risk of the portfolio. Employing finance and accounting-based workforce was adequate to ensure the shareholders' investments were safe and performing. Today, banks are employing people and consultants to track speed of change and evolution of technologies that could increase the pace of channel evolution or even open new channels. Additionally, this

requires that the speed of decisions of the banking industry must have to evolve to keep pace with the tech industry (American Banker, 2015).

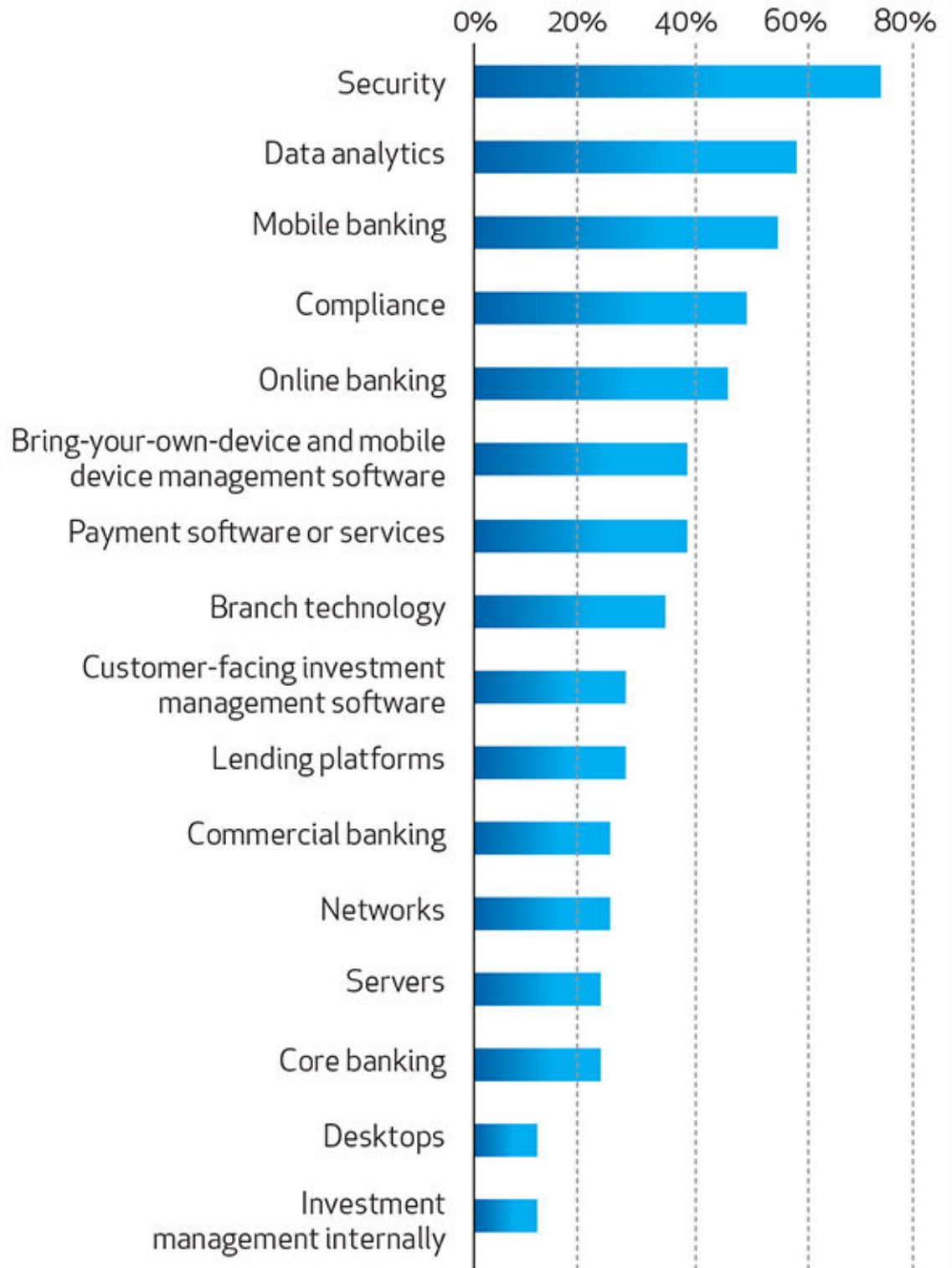
## **IX. Customer Concerns**

In every study performed, whether by banks, consulting agencies, newspaper or whoever else, concerns about security is the number one reason listed across the board for why individuals are resistant to adopting mobile banking. Having armed guards at the door and a Brinks truck were once the key security steps required to maintain the security of the customer investments, but with mobile banking, this is no longer the only customer concern.

With the evolution of mobile banking, the security requirements have also required advancement. Banks quickly reached out to high-tech firms to hire their top talent or secure consulting contracts to support software required to manage mobile banking.

Today, most companies have a seat on the board entitled Chief Security Officer. They have a staff of conventionally and unconventionally educated employees who look after the security of the electronic banking activities. Conventionally educated typically means educated at colleges and universities who have developed curricula to train students in this area. Unconventional training could come from former hackers and self-made talent who can think like a criminal such that technology gaps can be closed before the public discovers them. Again, this area of the organization was non-existent 20+ years ago, reflecting the need to evolve to survive. Refer to Table 7.

## WHERE BANKS ARE INCREASING TECH SPEND



Source: American Banker (2015). [The table shows what technology banks are spending money on in decreasing order of percentage of money.] Where Banks are Increasing Tech Spend. Retrieved from <http://www.americanbanker.com/news/bank-technology/banks-to-spend-more-on-tech-in-2016-especially-security-1077200-1.html>

The second most commonly listed reason for resistance to adopting mobile banking is customers not being aware of the services that are offered. Marketing for mobile banking was initially done mainly through in-branch advertising and banner advertising on bank websites. The paradox of these efforts is that the channels used to advertise mobile banking are the very channels that the banks are looking to transition customers away from in order to grow the mobile channel. Studies show that other forms of marketing would be more effective.

One alternative is social media. Social media is already a mobile phenomenon, and many users of social media are readily open to adopting mobile banking to satisfy their banking needs. Another method is through cookie tracing. Most mobile devices leave the cookie tracing option open to track website use. The marketers can target-market to the users who have propensity to click through select websites. This methodology is very effective in one-to-one marketing and where messages can be tailored to the potential target.

Table 8 shows an example of Chase.com target email click to website.

**CHASE** Chase.com | Find ATM / Branches | Contact Us

Chase Mobile™ How It Works Demo Security FAQ

## Text your account. It texts you back.

**Chase Mobile**  
 Personal checking, savings and credit card customers have 24-hour access to view balances, transaction history, credit card due date and amount without having to log on.

**Fast:**  
 Get access to your accounts within seconds anywhere your cell phone has service.

**Secure:**  
 At Chase, we use multiple safeguard technologies to keep your information secure.

**Free:**  
 There's no charge from Chase, but standard text messaging and other rates from your wireless provider still apply.

**Try** Chase Mobile

**Chase Mobile Resources**

- ▶ Chase Mobile Help Line: 1-877-210-1672, 7 AM to 9 PM, local time, 7 days a week
- ▶ [Demo](#)
- ▶ [Commands](#)
- ▶ [Device and Carrier Info](#)

The image shows two mobile phones. The left phone displays a text input screen with "SEND TO CHASE 21273" and "BAL". The right phone displays a text message from Chase with the following content:

```

MESSAGE FROM CHASE
CHK1 AVAIL $750
CARD $1800
AVAIL CROT $2200
BACK
  
```

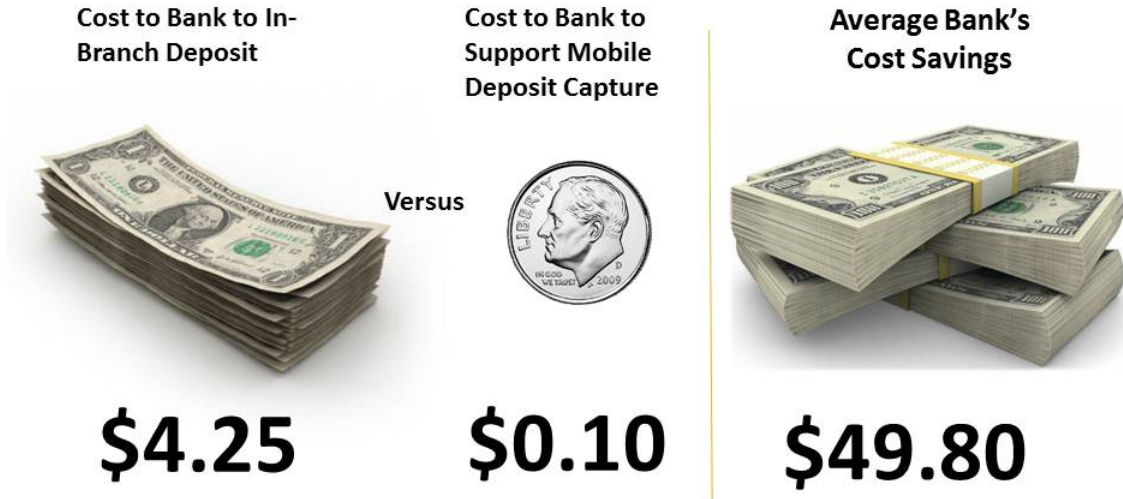
Source: Finovate (2008). [The chart depicts a Chase Bank advertisement for their text-banking feature.] *Text your account. It texts you back.* Retrieved from <http://finovate.com/category/chase-bank/page/4/>

## **X. Profit and Revenue Growth Opportunities**

Anytime banks introduce new payment channels or services, there is the opportunity to profit. As this new technology use became widely popular, it also became a price of entry to compete. Most banks made mobile banking a free offering and focused on front-line and back-office workforce reduction to save money. This was and is a significant tactic to offer this channel just to compete. Therefore, it requires a major shift for bank executives to not seek revenue for a major part of their product offerings. Those who find ways to do this most efficiently can win the battle of lowest cost provider, thus maintaining stronger margins than less efficient competitors. The main way noted to increase profit is realizing reduced costs affected by mobile banking. Twenty-nine percent of banks listed cost reduction as a reason to offer mobile banking as found by a study done by The Federal Reserve Banks of Atlanta, Boston, Dallas, Minneapolis, and Richmond (Board of Governors of the Federal Reserve System, 2015).

Table 9 is a simple example from Javelin Strategy & Research regarding in-branch and online deposits from their 4Q15 study.

## An Average FI Can Save Almost \$50 Annually with each Customer that Uses Mobile over Branch for a Single Monthly Deposit



Source: Monahan, Mary. (2013, July 2). Leveraging an Omnichannel Approach to Drive \$1.5B in Mobile Banking Cost Savings. Retrieved April 20, 2016 from <https://www.javelinstrategy.com/coverage-area/leveraging-omnichannel-approach-drive-15b-mobile-banking-cost-savings>

By converting deposit services to a mobile channel, banks are able to realize the savings of less in-branch deposits. The research by Javelin estimates \$1.5 billion in cost savings for the banking industry. “Since 2010, branch visits have dropped dramatically by 10 percentage points, while mobile banking has risen by the same amount” (Monahan, 2013). In an article from the American Banker in 2013, Citigroup stated they were closing 44 branches as part of a cost savings plan. PNC told investors they would be able



to lay off 40-45 tellers because they were handling over 7,000 mobile transactions daily. Banks are seeing more and more customers utilize mobile banking over branch visits.

A Wells Fargo employee stated that mobile banking helps strengthen the banks' relationships with customers. The more the bank satisfies the customer with simpler services, the easier it is to initiate conversations about more profitable financial products. Bank of America also tied their year-over-year growth in mobile banking, 31% in 2013, to their branch closures (Aspan, 2013).

Research conducted by Ram Acharya, Albert Kagan, and Srinivasa Rao Lingam proved that by offering an additional online banking channel, community banks significantly improved their performance (Ram, 2008). Research by Robert DeYoung found similar results. DeYoung studied small commercial banks that offer online banking and their financial performance as a result. He concluded that by offering online banking, banks had increased profitability. "These earnings increases are primarily driven by increases in noninterest income from service charges on deposit accounts. This implies that the added convenience of transactional Internet banking led some bank depositors to purchase additional fee-based services and/or to willingly pay extra for the services they previously purchased at bank branches" (DeYoung, 2007). A paper published in 2012 studied the relationship between self-service technology investments, specifically ATMs, and financial performance of firms. The conclusion was that SSTs do improve financial performance (Hung, 2012).

I believe the research by the above-mentioned papers fully supports the hypothesis that mobile banking could improve bank performance. ATMs and then online banking both preceded mobile banking in the same line of technological advancements

and services offered. In Hung's conclusion, he states that, "In addition to ATMs, several kinds of self-service technologies, such as telephone banking, internet banking and mobile banking, have been utilized to deliver their services by the banking industry. The impacts of these alternative SSTs and their interacting effects remain unknown and deserve further examination" (Hung, 2012). The methods of research used by these scholars would be an excellent platform to effectively measure improved performance as a result of mobile banking.

## **XI. Top-Performing Banks in the Nation in Mobile Banking**

In 2009, the Tampa Tribune wrote an article about research that graded banks on how well they were doing with mobile banking. They spoke to banks in the Tampa area and nationally. Banks that were graded as exceptional and very good happen to be national banks such as BB&T, Wells Fargo (a first mover), USAA, Bank of America, and Chase to list a few in the first two categories. Banks graded ‘below average’ include Regions and SunTrust.

In her June 30, 2015 article, Virginia C. McGuire of NerdWallet compiled a matrix of the best mobile banking institutions and some of their mobile banking features and benefits as well as improvement areas. Table 10 reflects a significant change from 2009 to 2015 in adopters and features offered.

| <b>Best Institution</b> | <b>Best for customers who want...</b>  | <b>Room for improvement</b> |
|-------------------------|--|-----------------------------|
| Bank of America         | The ability to make appointments at a branch via an award-winning mobile app | Spending tracker            |

|                 |  |   |
|-----------------|--|---|
| BB&T            | A good text banking service, in English or Spanish   | A fully functional person-to-person payment system                                      |
| Capital One 360 | A well-rounded online bank with a strong all-around mobile app   | The person-to-person payment feature was hard to use and has been temporarily suspended |
| Chase           | A good central place to manage their Chase bank and credit card accounts   | Budget tracking, smartwatch app   |
| Citibank        | Smartwatch compatibility, plus the option to see account balances without logging in through the Citi Mobile snapshot tool | Increased speed, improvements to smartwatch app   |
| PNC             | Sophisticated budgeting and wealth-management tools  | Wealth-management tool for customers without high balances                              |
| SunTrust        | To get a quick glimpse of balances without signing on  | Improved transaction history display  |

|             |  |                               |
|-------------|--|-------------------------------|
| U.S. Bank   | Photo bill pay, which lets you pay a paper bill electronically by snapping a picture | A free mobile deposit service |
| Wells Fargo | Access to Wells Fargo bank accounts, credit card, mortgages, and reward accounts     | Smartwatch app                |

(McGuire, 2015)

## **XII. Performance Review over Time Period of Top Banks**

From 2007-2010, Wells Fargo saw a significant reduction in deposit service charges and net servicing fees. Deposit service charges dropped from \$11,298 in 2007 to \$2,904 in 2010. Net servicing fees decreased from \$89 to \$10. Regions Bank had decreasing numbers for deposit service charges and net servicing fees as well. Deposit service charges in 2011 were \$810,842 and decreased every year to \$695,253 in 2014. Net servicing fees for Regions Bank were \$205,253 in 2010. By 2014, net servicing fees had dropped to \$104,187. These are not conclusive numbers, nor do they show a cause-and-effect relationship between the increase in mobile banking and the decrease of these revenues. However, they are stepping stones to look at performance numbers over the years that mobile banking has grown.

### **XIII. Risks & Recommendations**

First, for banks to see evidence of improved bottom-line performance related to mobile banking, they will have to realize cost savings. Transaction costs for mobile banking are less than every other service channel. However, if mobile banking is only added and nothing else is reduced or eliminated, there is not a large amount of cost savings. The biggest way savings can be realized is by reducing the amount of branches in a general geographic area. Teller and branch location fee reduction could cause a big shift in noninterest expenses. Back office efficiency will also be required to achieve required cost savings.

Secondly, the popularity of mobile banking is starting a customer behavior change. Attitudes towards mobile banking are shifting away from personal service to convenience and efficiency. The spread of this attitude and behavior will aid mobile banking in becoming the channel of choice for banking. This will require unique marketing to effectively communicate the message and a compelling call to action. If customers choose to use their app consistently over a visit to the branch or phoning the call center, those channels will start to phase out. Although, eliminating branches altogether is not a likely option. For singular occasions like problem solving, many customers still prefer a person-to-person conversation.

Lastly, security advancements must be cutting-edge to ensure integrity of the full aspect of banking features. Any breach could drive customers away and have a

significant leak in cash flow, causing investors to withdraw support. This area is one of the most crucial areas in which to invest for the success of the firm. The banks must employ staff and train them, or perhaps buy consultant services, to stay abreast of evolving technologies thwarting the ever-changing hacker strategies.



#### **XIV. Opinion and Conclusion**

In conclusion, my research explored two alternative possibilities regarding the impact of mobile banking on the banking industry: does the overall bank performance improve or does mobile banking just keep the bank in the competition? I submit that the data supports the latter conclusion more than the former.

As stated earlier, the industry as a whole has the opportunity to save over a billion dollars in costs from adopting mobile banking. Mobile deposits are much cheaper for the bank to process than in-branch deposits. Some of the largest banks like Wells Fargo have seen a reduction in non-interest income categories, like net servicing fees that could be a result of mobile banking growth.

My reasoning is that mobile banking has redirected the banking industry leadership to have a broader view than just core financial elements. It has required that a keen eye be kept on other leading edge technologies such as data transmission and broadband as well as mobile device evolution. Each of these technologies has an evolution that is accepted much faster by consumers than core financial instruments such as short-term and long-term interest rates, government bonds and stock trends that usually require a historical view to map the future. Security is another area of focus, in that a security guard and a Brinks truck will not be enough to ensure consumer security in this new environment. These focus areas have shifted or even added resources to the bank payrolls with different skill sets to ensure the ability to compete.

Additionally, the banks that can minimize the traditional cost of brick-and-mortar banking, yet keep that channel viable while evolving the mobile channel to keep and attract customers, will be the winners. It is unclear at this point if anyone has separated from the pack. I think that banks will find their stride in cost reduction over the next five years as a result of mobile banking requiring them to be more cutting-edge thinkers and more nimble in implementation of changes required in the services offered and security required. Mobile banking will need to become the primary or most used channel for banks to actually reduce brick and mortar costs.

Given the migration to mobile banking and the appetite for new features, I suggest that having an attractive mobile banking product offer keeps the bank in competition for the customer's business and loyalty, particularly as the demographics of users changes to more millennial's who are very transient in their use of features and benefits. An example is how retirement plans have evolved to become more mobile and transferable to attract this demographic as they move through cycles of jobs, services, products, brands, etc. Banks and the entire banking industry will have to evolve to maintain a market share with the mindset of this growing demographic.

The uncertainty of mobile banking is with customer retention or loyalty. Once that aspect is sorted out and banks can fully develop integrated plans with products, service offers and retention plans, the performance indicators will begin to more fully reflect success in improving year-on-year. That said, I believe research in this area over the next 3-5 years will prove the existence of performance improvements. Until such time, I will hold to my primary opinion that mobile banking is a required channel required to enter the game and not the end-all route to better financial performance.

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