1-1-2005

The Check Clearing for the 21st Century Act (Check 21) and Its Effect on Large vs. Small-Sized Corporations and Large vs. Small-Sized Banks

Steven Illingworth

NORTHERN ILLINOIS UNIVERSITY

The Check Clearing for the 21st Century Act (Check 21) and Its Effect on Large vs. Small-Sized Corporations and Large vs. Small-Sized Banks

A Thesis Submitted to the

University Honors Program

In Partial Fulfillment of the

Requirements of the Baccalaureate Degree

With University Honors

Department of

Finance

By

Steven Illingworth

DeKalb, Illinois

May 14, 2005

University Honors Program

Capstone Approval Page

Capstone Title: (print or type):

The Check Clearing for the 21st Century Act (Check 21) and Its Effect on Large vs. Small-Sized Corporations and Large vs. Small-Sized Banks.

Student name (print or type): Steven Illingworth

Faculty Supervisor (print or type): Dr. Diane Docking

Faculty Approval Signature: Dr. Diane Docking

Department of (print or type): Finance

Date of Approval (print or type): May 13, 2005

HONORS THESES ABSTRACT
THESIS SUBMISSION FORM

AUTHOR: Steven Illingworth

THESIS TITLE: The Check Clearing for the 21st Century Act (Check 21) and Its Effect on Large vs. Small-Sized Corporations and Large vs. Small-Sized Banks.

ADVISOR: Dr. Diane Docking

ADVISOR'S DEPT: Finance

DISCIPLINE: Finance

YEAR: 2005

PAGE LENGTH: 20

BIBLIOGRAPHY: Pages 19-20

ILLUSTRATED: Two Charts

PUBLISHED: No

COPIES AVAILABLE: Hard Copy

ABSTRACT:

Check 21 will in some way affect everyone who comes in contact with the United States financial markets. This paper explores how Check 21 will affect large-sized banks (over $100 billion in total assets) compared to the effect it will have on small-sized banks (less than $5 billion in total assets). The effect on large-sized banks should be considerably greater than the effect on small-sized banks. This study also explores the effect on large corporations (over $500 million in annual revenue) compared to the effect on small corporations (less than $50 million in annual revenue). The effect on large corporations should be considerably more than the effect on small corporations.

Both large and small banks will be considerably affected by Check 21. Even though both large and small banks will be impacted by Check 21, because of the magnitude that large banks will be affected, it is my conclusion that Check 21 will have a considerably larger impact on large-sized banks compared to small-sized banks. It is also my finding that large corporations will be considerably more affected than small corporations will be by Check 21.

Information and opinions were obtained from personal interviews from selected banks and corporations - interviews conducted with banking professionals and corporate treasury personnel. Various articles were read and discussed on the topic of Check 21 to ascertain others' feelings regarding their opinions of the impact of Check 21. Along with these secondary sources, one primary source - Check Clearing for the 21st Century Act (Check 21) document – was referenced.

INTRODUCTION

On September 11, 2001 the United States of America suffered one of its most devastating tragedies to date. In a terrorist attack, two planes flew into the World Trade Center Towers in New York City and one plane flew into the Pentagon Building in Washington D.C. These two attacks caused the Federal Aviation Administration to ground all flights in the US for the ensuing four days.[1] Grounding all flights brought the airline industry to a standstill, left passengers stranded, and sent travelers scrambling to find other means of transportation. What was not apparent to most people at the time, but was an extremely problematic situation according to Bank of America, "were all the hundreds of thousands of checks which lay undeliverable, representing millions of dollars of trade in stasis."[2] The grounding of all the flights brought to light the inefficiency of the United States' check clearing system. Elaborating, Bank of America explains that the inefficiency of the check clearing system lay in the fact that "all checks had to be physically presented for payment to paying banks. This requirement entailed the daily transport of billions of dollars worth of checks."[3] Because the checks could not be delivered to the banks upon which they were written, many businesses did not receive their money as expected. This could have caused a major financial crisis in the United States, but the Federal Reserve stepped in and provided a line of credit for those funds that were undeliverable. Because the Fed took this action, the U.S. was able to divert a financial crisis. The Federal Reserve realized, however, that they could not do this every time a financial crisis caused checks to become undeliverable. Thus the Federal Reserve began to formulate an Act entitled "H.R 1474, Check Clearing for the 21st Century Act,"

---

[1] "Check 21 and Check Fraud." Charlotte: Bank of America, 2004.

[2] Vanishing Point: Check 21 and the Future of US Check Processing. 2004. Bank of America. 9 Feb. 2005 <http://corp.bankofamerica.com/public/products/pdf/treasury/wcm_ar_vanishing.pdf>.

[3] "Check 21 and Check Fraud." Charlotte: Bank of America, 2004.

commonly known as Check 21. The Act was unanimously passed by both the House of Representatives and the Senate, and was signed into law on October 28, 2003 by President George W. Bush. It went into effect one year later on October 28, 2004. The final steps to activate Check 21 were taken on July 26, 2004, when the Board of Governors of the Federal Reserve System released its final ruling amending Regulation CC, Availability of Funds and Collection of Checks, to implement the Check 21 Act. A new subpart D was added, which details the requirements of the Check 21 Act that apply to banks, provides an example of consumer awareness disclosure and notices for educating consumer customers about their rights under the Act, and specifies bank endorsement and identification requirements for substitute checks.[4]

WHAT IS CHECK 21?

What is Check 21, and what are the objectives of Check 21? According to the Federal Reserve, in its simplest form "Check 21 is designed to foster innovation in the payments system and to enhance its efficiency by reducing some of the legal impediments to check truncation."[5] The term ''truncate'' means to remove an original paper check from the check collection process. This can be done in lieu of the original paper check by using a substitute check, by agreement, or by using information relating to the original check (including data taken from the MICR line of the original check or an electronic image of the original check).[6] A banking institution must be able to accept an IRD (image replacement document) from another banking institution, but the legislation does not require a bank to participate in the imaging process.

---

[4] The Federal Reserve Board. Check Clearing for the 21st Century Act. 27 Jan. 2005. 9 Feb. 2005 <http://www.federalreserve.gov/paymentsystems/truncation/faqs.htm&gt>.

[5] The Federal Reserve Board. Check Clearing for the 21st Century Act. 27 Jan. 2005. 9 Feb. 2005 <http://www.federalreserve.gov/paymentsystems/truncation/faqs.htm&gt>

[6] Cong. House. Check Clearing for the 21st Century Act. US 108 Cong., 1334 sess. HR 1474. 28 Oct. 2004. Feb. 2005 <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong public_laws&docid=f:publ100.108.pdf>.

The law facilitates check truncation by creating a new negotiable instrument called a substitute check. This is the most important aspect of Check 21's legislation. A substitute check is a paper reproduction of the original check that includes electronically captured images of the front and back of the original check and reproduction of the original MICR line. These substitute checks are also commonly known as Image Replacement Documents, or IRDs. The "Check Clearing for the 21st Century Act" defines a substitute check as "a paper reproduction of the original check that contains an image of the front and back of the original check, bears a MICR line containing all the information appearing on the MICR line of the original check, except as provided under generally applicable industry standards for substitute checks to facilitate the processing of substitute checks, conforms, in paper stock, dimension, and otherwise, with generally applicable industry standards for substitute checks, and is suitable for automated processing in the same manner as the original check."[7] These standards and requirements are illustrated and highlighted in Figure 1.[8] These are the standards that a substitute check must meet in order for that substitute check to be deemed a legal substitute of the

---

[7] Cong. House. Check Clearing for the 21st Century Act. US 108 Cong., 1334 sess. HR 1474. 28 Oct. 2004. Feb. 2005 <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong public_laws&docid=f:publ100.108.pdf>.

[8] http://umb.com/images/gen/sample_check.jpg

original check.

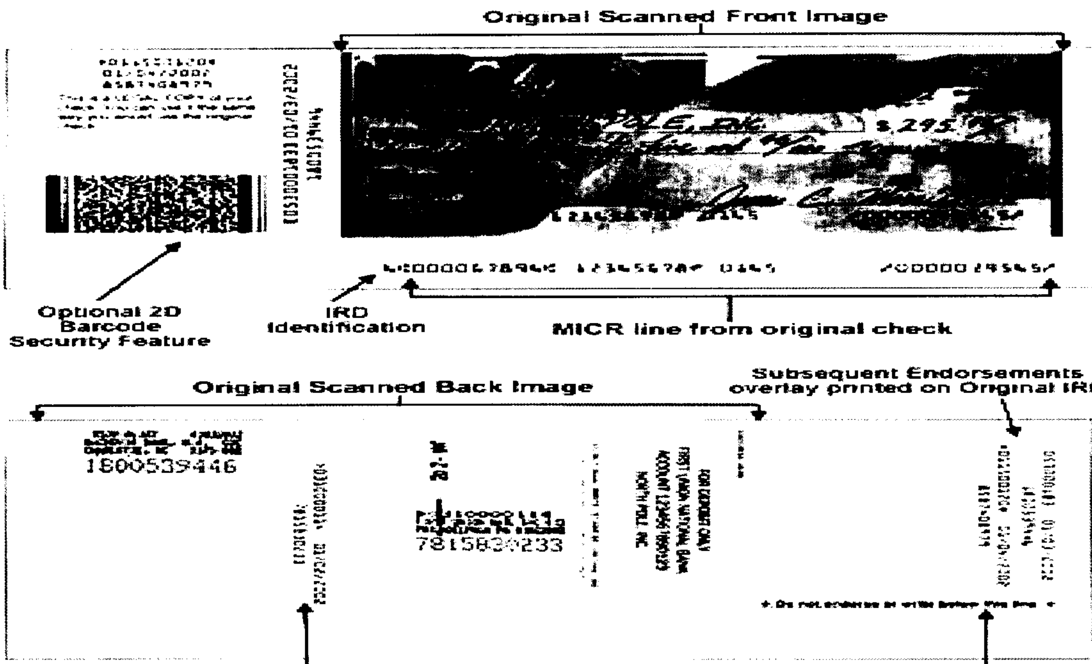

Figure 1

The legislation does not require any individual institution to change its current check-processing method, except that it must accept an IRD if it is presented to the institution. Check 21 leaves open the option of processing checks electronically until it is determined by the banking institution that electronic processing is advantageous to its particular business operation.[9]

THESIS

Check 21 will in some way affect everyone who comes in contact with the United States financial markets. This paper explores how Check 21 will affect large-sized banks (over $100 billion in total assets) compared to the effect it will have on small-sized banks (less than $5 billion in total assets). The effect on large-sized banks should be considerably greater than the effect on small-sized banks. This study also explores the

[9] The Federal Reserve Board. Check Clearing for the 21st Century Act. 27 Jan. 2005. 9 Feb. 2005 <http://www.federalreserve.gov/paymentsystems/truncation/faqs.htm&gt>.

effect on large corporations (over $500 million in annual revenue) compared to the effect on small corporations (less than $50 million in annual revenue). The effect on large corporations should be considerably more than the effect on small corporations.

LARGE CORPORATIONS

Large corporations should see a major cost savings as a result of Check 21. There are several aspects of Check 21 that will result in bottom line savings for large corporations. These cost savings would occur because of technology improvements, reconciliation, and decreased accounts. Check 21 offers larger corporations the opportunity to invest in technology that will allow them to perform remote deposits. Corporations can invest in a device that will take the checks they collect locally, convert them to IRDs, and transmit those images straight to the bank. In an interview with Paul LaRock, Director of Treasury Operations for *The ServiceMaster Company,* he discussed how these truncation devices could help *The ServiceMaster Company* eliminate some of the depository accounts it currently holds in the field[10]. Maintaining fewer accounts open at different banks, this presents a significant opportunity for corporations to cut the costs of monthly bank analysis. In addition to saving money by maintaining fewer accounts, check truncation devices offer companies cost savings by reducing the number of employees required to deposit money and reconcile the accounts. With check truncation devices, employees no longer need to leave the office to deposit checks. They can simply scan the checks into the IRD device and transmit the file to the bank. This process is much more efficient than having the employee leave the office, travel to the bank, wait to make the deposit, and travel back to the office. For some company locations this may not be a problem; however, for a location without banking facilities in close proximity, check

[10] LaRock, Paul. Personal interview. 4 Mar. 2005.

truncation offers a significant time savings. These cost savings may start out small for a lot of corporations, but "as image exchange gradually gains momentum and builds volume, payees that deposit a large volume of checks should be able to work with their banks to keep check fees low, improve efficiency, and optimize availability on transit items."[11]

In a manner similar to current retail lockbox operations, Check 21 offers time savings with regard to account reconciliation. According to Martha Byers, Cash Manager for *The ServiceMaster Corporation,* explains that companies that use a retail lockbox system can obtain a file from the bank that can be imported into their reconciliation software, which makes bank reconciliation much easier and faster than using the manual process.[12] Check 21 offers this same system without the need for a lockbox. According to Clayton Bill, Vice President of Global Treasury Services for *Bank of America,* once the company transmits the imaged check to the bank and once the check is processed by the bank, the bank will be able to transmit a file back to the company that will allow the company to do account reconciliations in nearly the same way that it currently does with retail lockboxes.[13] Check 21 offers companies without lockboxes a way to achieve the same efficiency as companies with lockboxes, without the additional expenses. There is, however, a cost associated with the new efficiency of IRD devices. In the short run, companies will have to invest a significant amount of money in Check 21 technology and software. Though the exact cost of implementation is not known at this point, companies anticipate a significant startup cost associated with Check 21.[14] The IRD devices

---

[11] "Frequently Asked Questions about Check 21 and its Impact on Corporate Treasury." Bethesda: Association for Financial Professionals, 2004.
[12] Byers, Martha . Personal interview. 17 Mar. 2005.
[13] Bill, Clayton. Personal interview. 14 Mar. 2005.
[14] LaRock, Paul. Personal interview. 4 Mar. 2005.

themselves cost anywhere from $400-5,000 each depending upon the model.[15] This cost does not include the software modifications that may be needed in order for the machines to process checks and transmit them to the banks' specifications. The device cost itself may not be prohibitive, but the modification costs are unknown and will more than likely be significant.

Another factor that large corporations must consider regarding Check 21 is disbursement float. According to Norman Goldstein, Professor of Treasury Management at Northern Illinois University, corporations seek to extend disbursement float as much as possible.[16] Check 21 will cause check float to decrease, which will in turn decrease disbursement float. Decreased disbursement float means that corporations have less opportunity to make short-term investments in order to earn interest revenue. Though Check 21 will decrease float by only one or two days, for larger corporations that invest millions of dollars overnight, this could be a significant loss of revenue. ServiceMaster's Treasury Director is not worried about this issue because he feels that the money that is lost through decreased disbursement float will be offset by a decrease in collection float.

Check security under Check 21 is another area of concern for large corporations. Paper-based checks offer numerous security features that can be added to help prevent fraud. Some paper-based security features that corporations can incorporate in their checks include thermochromatic ink, holograms, artificial watermarks, and secured number fonts.[17] With current technology "many of the existing fraud controls in the check payment system have resided in the physical document. These controls become ineffective once the paper check is truncated, and this creates new ways for fraudsters to

[15] Bill, Clayton. Personal interview. 14 Mar. 2005.
[16] Goldstein, Norman . Personal interview. 5 Feb. 2005.
[17] "Check 21, Check Fraud, Identity Theft and Embezzlement." North Hollywood: Safe Checks, 2005.

alter checks and present them for payment."[18] *The ServiceMaster Company* currently employs several different techniques to prevent check fraud. Check 21 introduces the questions of what new security measures should be employed to keep the company safe from check fraud, and what security measures are currently in use that are no longer going to be needed.[19] Most technology that is being used on paper-based checks will become obsolete because of Check 21. In order to innovate new technology "there are industry initiatives in various stages of development to create watermarks, three-dimensional barcodes, electronic seals, and holograms that can be transferred from original check, to electronic image, to substitute check."[20] Once the technology has been perfected it will likely become the new standard for fraud protection. A system that is currently in use that helps with fraud protection for both paper-based checks and imaged or substitute checks is Positive Pay. Positive Pay is an automated fraud detection tool. This service matches the account number, check number, and dollar amount of each check presented for payment against a list of checks previously authorized and issued by the company. All three components of the check must match exactly or the bank will not pay the check.[21] Positive Pay is a security feature that large corporations can employee today that will allow them to decrease check fraud no matter if they are using paper-based checks or image-based checks.

Check 21 offers corporations the ability to image any check no matter if it is a consumer check, corporate check, or money order. *The ServiceMaster Company* is currently using a system called ARC (Account Receivable Checks) for the consumer-

---

[18] "Frequently Asked Questions about Check 21 and its Impact on Corporate Treasury." Bethesda: Association for Financial Professionals, 2004.
[19] LaRock, Paul. Personal interview. 4 Mar. 2005.
[20] "Frequently Asked Questions about Check 21 and its Impact on Corporate Treasury." Bethesda: Association for Financial Professionals, 2004.
[21] SafeChecks-Positive Pay. Safe Checks. 21 Mar. 2005 <http://positivepay.net/info.htm>.

based checks that it receives. Unfortunately, ARC can only be used on consumer checks and cannot process corporate checks. ARC has the ability to take a consumer's check and convert it into an electronic ACH file, then clear the check through the ACH process. One of the problems with ARC is that consumers can request that their checks not be converted into an ACH through ARC. Under Check 21, consumers have no choice as to whether their checks are converted into image files. Check 21 also has the ability to convert corporate checks, money orders, and government checks into image files.[22]

SMALL CORPORATIONS

Unlike the significant impact that Check 21 will have on large corporations, small corporations will not be greatly affected. In a few areas however, small corporations will feel a greater impact because of Check 21 than larger corporations will. Small corporations typically do not have as much cash on hand, nor the borrowing power that the larger corporations have. With Check 21 small corporations will have "less play days with accounts payable because of the decreased float."[23] With the decreased float, corporations must expect that the checks they write will clear immediately. This will force smaller corporations to be more aware of their daily cash balances than they previously were. A benefit of the decreased float for small corporations is that they will have fewer accounts payable on their books.

A problem that small corporations are running into involves their accounts receivable. Typically, small corporations tend to do business with small corporations. With this business setup, small corporations are being forced to look at the credit terms that they are offering to other companies. It appears to Kim Schneider, an accounts receivable employee of Driv-Lok Company that, "our customers seem to be extending

[22] LaRock, Paul. Personal interview. 4 Mar. 2005.
[23] Schneider, Kim. Personal interview. 8 Apr. 2005.

their credit terms a bit longer than usual,"[24] and she credits this pattern to Check 21. She thinks that her company's clients are extending their credit terms because they know that their checks are going to be clearing more quickly, so to avoid bouncing a check they are sending their checks in later than usual.

Lack of knowledge regarding Check 21 is another obstacle that small corporations face. Many small corporations are not aware of Check 21's purpose and what it entails. The employees of Driv-Lok were not informed of Check 21's existence until 30 days prior to its effective date. Their only information about Check 21 and how it would affect their business came through a mailer that their bank sent along with the monthly analysis.[25] This was problematic because it provided no adjustment time for the company. The company could have better prepared itself for Check 21 if it had known what the act was about and when it was going into effect.

Unlike the large corporations, most small corporations will conduct their businesses as usual. Unlike large corporations, small corporations will not be investing a significant amount of money into new technology that will allow them to process checks from remote locations to banks without having to physically deliver the checks. Smaller corporations also handle fewer checks and less money, so the float loss that will occur because of Check 21 will have a better chance of being offset by decreased disbursement float and decreased collection float.

LARGE BANKS

Check 21 will have the greatest impact on large banks. With the six "vanguard" banks (Bank of America, JPMorgan Chase, Comerica, US Bank, Wachovia, and Wells

[24] Schneider, Kim. Personal interview. 8 Apr. 2005.
[25] Schneider, Kim. Personal interview. 8 Apr. 2005.

Fargo) processing over 50% of the nation's check volume,[26] they will be forced to invest more time and money in Check 21 and the technology that Check 21 requires. In the short term, for the larger banks this will be a very expensive process. Larger banks will need to invest in the Check 21 technology necessary for image exchange and the creation of substitute checks. A large part of the initial cost for large banks to date has been the employee hours expended to create agreements between the larger banks regarding image exchange. The issue that the large banks must negotiate is who is liable for the imaged check and at what point. Each bank wants to be liable for the least amount of time during the image exchange process; because everyone wants the same thing, it has been difficult to come to a consensual agreement. According to Judy Schoch, First Vice President for JPMorgan Chase, the real benefits of Check 21 will not be realized until image exchange is implemented. Most of the larger banks are not investing a great deal of their money and efforts into the substitute check portion of Check 21, but rather the image exchange process that Check 21 now allows.[27] With the majority of the image exchange volume not expected until 2006 and 2007,[28] the majority of the cost savings and float savings will not occur until then.

Large Banks must meet the significant cost of educating their customers. With a wide variance in the knowledge base of their customers, the banks found it difficult to educate their customers about Check 21. It appears to Judy Schoch that "the older that the customer was the less they knew about Check 21."[29] The larger banks did a mass mailing to all of their customers providing information about Check 21. Along with the

---

[26] Cornelius, Joe . The Check Clearing for the 21st Century Act. Wachovia Corporation. ServiceMaster, Downers Grove. 1 June 2004.
[27] Schoch, Judy. Personal interview. 1 Apr. 2005.
[28] Cornelius, Joe . The Check Clearing for the 21st Century Act. Wachovia Corporation. ServiceMaster, Downers Grove. 1 June 2004.
[29] Schoch, Judy. Personal interview. 1 Apr. 2005.

mailer the larger banks updated their websites, made presentations to their larger corporate customers, and answered customer questions at individual branches. This education process was a huge but necessary cost for the larger banks.

Another issue that concerns the large banks is the return on their investment in the image exchange technology. As illustrated in Figure 2,[30] check volume has decreased over the past three years and is projected to continue to do so over the next five years. If check volume continues to decrease each year, it will be difficult for banks to recover sufficient cost savings to offset the expense of implementing Check 21 technology.

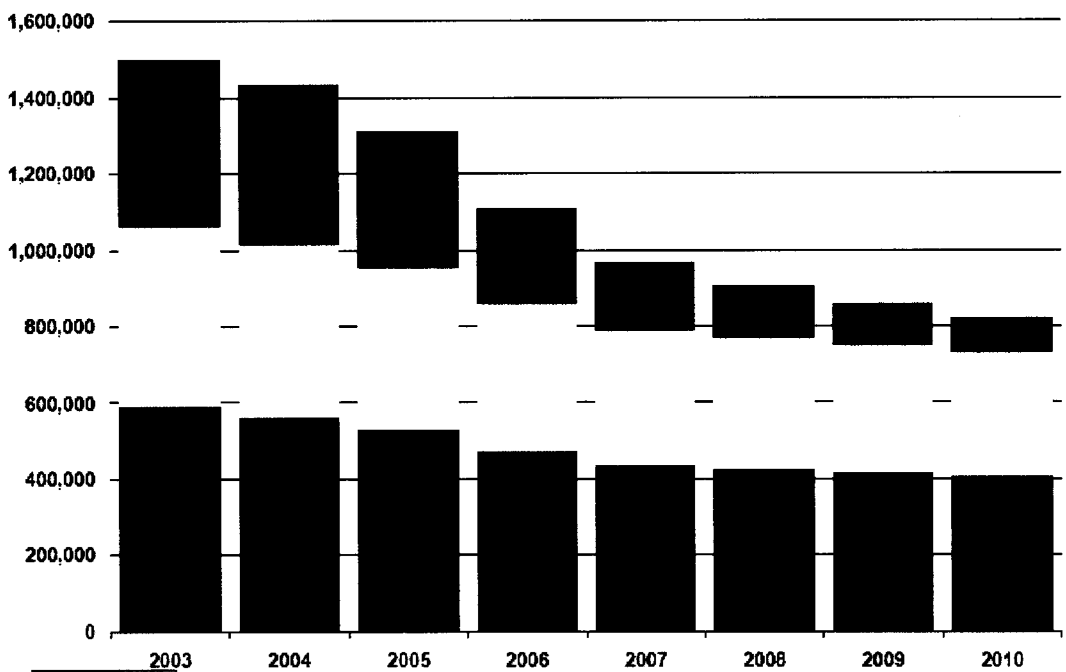

Figure 2

As a result, the larger banks are viewing IRDs as an interim solution and are doing the minimum amount with substitute check creation technology, and focusing instead on image exchange.

Because of the costs that the large banks have had to incur to implement Check 21, they anticipate a substantial cost savings from the system. According to Judy Schoch,

[30] MetaSoft. 2004. 13 Apr. 2005 <http://www.metasoft.com/EOCEXFinal.pdf>.

the costs that the larger banks will incur because of Check 21 will not be passed along to the consumer. As a result, the money that the banks will save in the long run through the implementation of image exchange will be pure profit for them. Though the cost savings will not begin to occur until 2006 and 2007 when image exchange volume begins to pick up, the long term benefits should be significant. The banks should be able to save money with check processing, fraud detection, decrease in float, and new services they will be able to offer because of Check 21 and image exchange. At this point, no one knows how much money the banks will be able to save because of Check 21. However, if they did not expect a long-term cost savings, the large banks would not be investing so much money in Check 21.

SMALL BANKS

The impact that Check 21 will have on smaller banks should be significant in the long run. For small banks, the initial implementation of Check 21 in most cases will be viewed as burdensome. Initially, Check 21 will be difficult for small banks to cost justify considering the significant amount of money required for the new truncation technology that is associated with Check 21. Banks realize that "it's just the electron world. It seems like daily we discuss whether we can afford some technology upgrade or purchase."[31] All banks must invest in new technology that will permit them to accept the digitized checks, but not all banks will invest in the technology that allows them to truncate the checks by converting them to IRDs. According to Rob Eifel, Assistant Vice President & Senior Credit Analyst for National Bank and Trust of Sycamore, the bank's officers believe that the payback period on Check 21 technology is going to be about 3-5

---

[31] Keenan, Charles. "High Wire Act: Balancing Technology Outlays in an Era of Tight Margins." Community Banker. Oct. 2004: ABI Inform. 16 Feb. 2005

years.[32] For some small banks a 3-5 year payback period is too long for them to wait to re-coop the expense of implementing Check 21. Hence, some small banks will not take full advantage of Check 21. Some smaller banks will instead outsource the check truncation process to a third party vendor. This is the method that National Bank and Trust is currently using to meet the needs and demands of its customers, until it is able to implement the technology itself. Outsourcing is currently the most efficient way for National Bank and Trust to process checks.[33]

Another added cost for the small banks will be educating their customers and their staff about Check 21. According to the Federal Government every bank must inform its customers about Check 21, explain how it affects them, and provide the basic information surrounding Check 21. In order to comply with the Federal Government, National Bank and Trust sent out a brochure with the customers' monthly statements that highlights the major elements of Check 21. Along with the brochure, National Bank and Trust dedicated a portion of its website to Check 21.[34] This process is an added expenditure for the banking industry. According to Rob Eifel, there was no significant cost associated with educating the staff of National Bank and Trust about Check 21. The bank conducted a half-day seminar introducing Check 21, and the employees who will be dealing with Check 21 on a daily basis received additional training.

Though Check 21 is a cost burden on small banks initially, there will be long-run significant benefits. With Check 21 there will be fewer paper-based checks processed by the bank. With the decrease in the number of paper-based checks that bank employees will handle, there will be a cost savings associated with employee time savings. Local

---

[32] Eifel, Rob . Personal interview. 10 Mar. 2005.
[33] Eifel, Rob . Personal interview. 10 Mar. 2005.
[34] Eifel, Rob . Personal interview. 10 Mar. 2005.

banks are already beginning to see the cost savings associated with Check 21. A "local Oklahoma Bank, a 2.9 billion bank in Oklahoma City, last year reported gross savings in excess of $40,000 after installing check image capture technologies..."[35] Since Check 21 did not take effect until October 28, 2004, the $40,000 dollar savings was realized over only two months. If that trend were to continue, the result would be an annual $240,000 dollar cost savings, which would be a significant amount of money for a small bank such as Local Oklahoma. A cost savings technique that most small banks will not be able to take advantage of is "point of sale" imaging. In this process "... banks will be able to have their larger corporate customers scan checks right at their businesses, rather than bringing them to the bank for scanning. Not only would the process save labor costs on the part of the bank, but also it could bring in fees for the bank..."[36] However small community banks typically do not have large corporate customers; thus, they will be losing out on possible cost savings and revenue streams.

CONCLUSION

Both large and small banks will be considerably affected by Check 21. Even though both large and small banks will be impacted because of Check 21, because of the magnitude that large banks will be affected, it is my conclusion that Check 21 will have a considerably larger impact on large-sized banks compared to small-sized banks. It is also my finding that large corporations will be considerably more affected when compared to small corporations by Check 21.

---

[35] Murphy, Patricia. "It's a Time of Change for Check Processing." US Banker. May 2004: ABI Inform. 16 Feb. 2005

[36] Keenan, Charles. "High Wire Act: Balancing Technology Outlays in an Era of Tight Margins." Community Banker. Oct. 2004: ABI Inform. 16 Feb. 2005

REFERENCES

Bill, Clayton. Personal interview. 14 Mar. 2005.

Byers, Martha . Personal interview. 17 Mar. 2005.

"Check 21 and Check Fraud." Charlotte: Bank of America, 2004.

"Check 21, Check Fraud, Identity Theft and Embezzlement." North Hollywood: Safe Checks, 2005.

Cornelius, Joe . The Check Clearing for the 21st Century Act. Wachovia Corporation. ServiceMaster, Downers Grove. 1 June 2004.

Cong. House. Check Clearing for the 21st Century Act. US 108 Cong., 1334 sess. HR 1474. 28 Oct. 2004. Feb. 2005 <http://frwebgate.access.gpo.gov/cgi-bin/getdoc.cgi?dbname=108_cong public_laws&docid=f:publ100.108.pdf>.

Eifel, Rob . Personal interview. 10 Mar. 2005.

"Frequently Asked Questions about Check 21 and its Impact on Corporate Treasury." Bethesda: Association for Financial Professionals, 2004.

Goldstein, Norman . Personal interview. 5 Feb. 2005.

Keenan, Charles. "High Wire Act: Balancing Technology Outlays in an Era of Tight Margins."Community Banker. Oct. 2004: ABI Inform. 16 Feb. 2005

LaRock, Paul. Personal interview. 4 Mar. 2005.

MetaSoft. 2004. 13 Apr. 2005 <http://www.metasoft.com/EOCEXFinal.pdf>.

Murphy, Patricia. "It's a Time of Change for Check Processing." US Banker. May 2004: ABI Inform. 16 Feb. 2005

SafeChecks-Positive Pay. Safe Checks. 21 Mar. 2005 <http://positivepay.net/info.htm>.

Schneider, Kim. Personal interview. 8 Apr. 2005.

Schoch, Judy. Personal interview. 1 Apr. 2005.

The Federal Reserve Board. Check Clearing for the 21st Century Act. 27 Jan. 2005. 9 Feb. 2005 <http://www.federalreserve.gov/paymentsystems/truncation/faqs.htm&gt>.

Vanishing Point: Check 21 and the Future of US Check Processing. 2004. Bank of America. 9 Feb. 2005 <http://corp.bankofamerica.com/public/products/pdf/treasury/wcm_ar_vanishing.pdf>.