

## **Are banking customers concerned about cyber security with their financial institution?**

James B. Bexley, PhD  
Sam Houston State University

Karen Sherrill, PhD  
Sam Houston State University

### **Abstract**

This paper examines customers' concerns with cyber security at their financial institutions. We use a survey to poll a variety of people of different ages, who use different types and/or sizes of financial institutions. We examine their general concerns with their financial institution's cyber security. We also ask questions specific to customer usage of mobile applications and internet based applications. We find that the age of the customer is related to the amount of concern that they have, with the youngest age group having the least amount of concern and the oldest age group having the greatest level of concern. We also find that customers who use small community based banks have fewer concerns with using mobile and internet based applications than those that use banks with nationwide locations.

Keywords: Cyber Security, Banks, Customer Concerns, Age, Mobile Applications

## **INTRODUCTION**

With the number of cyber-attacks in the news and the ransom demands placed on corporations by hackers that take control of their data, we wanted to investigate how comfortable people are regarding cyber-based interactions with their financial institution. Are banking customers scared to use mobile applications and internet based applications or do they consider these secure from hackers? Do people have more confidence in larger financial institutions than smaller ones? Do customers perceive that nationwide banks have greater security built into their mobile and internet based applications than the smaller regional or local banks?

As banks try and attract new customers, they need to be aware of customers' perceptions regarding their security. If potential customers perceive that a financial institution's mobile and/or internet applications are not secure from hackers they are not likely to do business with that institution. Are potential customers' perceptions of bank security related to the size of the institution? Also, banks should be cognizant of the level of concerns potential customers may have. They need not spend money to attempt to assuage fears regarding cyber security if the potential customers have no fears. However, if people of a specific demographic have a higher fear level than those of other demographics, it would behoove the financial institution to be aware of this and spend the resources to alleviate those fears.

This paper uses data from a survey administered by students in a commercial banking class to identify the level of concern that customers of financial institutions have regarding cyber security. We further examine if these fears are greater for certain ages or genders. We also examine the level of concern for customers of different sizes and types of financial institutions. We find that the age of the respondent and the size of the financial institution used by the respondent are related to the respondent's level of concern.

## **LITERATURE REVIEW**

There is a dual threat in the cyber-security arena. A survey by idRadar, Inc. (2014) noted that in excess of 250 million individuals had been victims of data breaches and as such there was an increased risk of identity theft since Target's major breach. Additionally, a shocking survey item found that almost 80 percent of those surveyed have done nothing to protect their data. Further, the survey indicated that most respondents don't take time to change their password, and 58 percent said they would not change their password unless forced to do so by the company.

Marshall (2016) found that the hacks into Sony, Ashley Madison, and a number of other large companies has called attention to the consuming public that their data is likely not secure. Despite all the major hacks, there appears to be a lack of concern on the part of consumers to push for protection of their data.

Romeo (2016) quoted a U. S. Census Bureau Report that indicated every time you access the Internet you take a huge risk. It appears that there is a lack of concern for the risk by the average consumer. Low (2017) found that insuring against cyber risk is substantially higher than general liability insurance, but it would be wise protection.

## **METHODOLOGY**

This paper is based on the results of a survey. Each student in a commercial banking class was tasked with administering a number of surveys to individuals of all ages. The students were instructed in the proper methodologies for confidentiality when using human test subjects. The completed surveys were collected by the class professor.

We collect some basic demographic information such as gender and age. We ask the respondents what type or size of financial institution they currently use for their banking. We give five choices; a locally owned community bank, a regional bank, a bank that has locations nationwide, a credit union, or some

other type of financial institution. We then use this data to analyze the responses to questions regarding security concerns.

We assess the concerns people have with their financial institutions via three different questions. First, we ask if the respondent has any general concerns with cyber security at their financial institution. Second, we ask about concerns with mobile (smartphone) banking, and last, we ask about concerns with internet banking. The actual survey is attached as Appendix 1.

We obtain the results for each question for the entire survey population. We then compare the responses of a particular subset of the population to the overall results and determine if there is a statistically significant difference in the population subset's responses versus the overall responses. We use a chi square test to check for statistical significance in the differences. If we find that the difference has a significance level of 10% or better, we consider those results significantly different.

## **OVERALL SURVEY RESULTS**

We have one hundred and ninety-five survey respondents. Ninety-nine of the respondents are male and ninety-six are female, giving us an almost 50/50 split. We ask the respondents to select an age group out of four possible choices; under twenty five, twenty-five to thirty five, thirty-six to fifty, and over fifty. We have 44% in the under twenty-five category and approximately 20% in each of the remaining categories. Table 1 shows the specific percentages.

We asked the respondents what type or size of financial institution they primarily use for their banking needs. Not surprisingly, the majority or 50% use a bank with nationwide locations. 22% use a locally owned community bank, 14% use a credit union, 11% use a regional bank, and 3% chose the other category. This is also shown in Table 1.

We ask respondents to choose one of three statements that best describes their general thoughts regarding cyber security at their financial institution. The first selection is that they have no concerns regarding cyber security with their financial institution. 36% of the respondents selected this response. 38% indicated that they did have concerns about cyber security, but had not taken any actions due to those concerns. The remaining 25% indicated that they are very concerned and have taken actions to protect themselves from threats. These results are shown in Table 2.

We next asked respondents to select from one of five options regarding their thoughts about the security of their financial institution's mobile, or smartphone based applications. 40% of the respondents indicated that they use their institutions mobile applications and have no concerns regarding cyber security with those applications. 33% use their institutions mobile applications, but do have concerns with security and therefore limit their usage to try and protect themselves from threats. Only 10% of the respondents forego usage of their financial institution's mobile applications due to security concerns. Table 2 shows these results.

We ask a similar question with regard to internet based banking applications, and we find that again 40% of the respondents use internet banking and have no concerns with the security of the application. 32% of the respondents use internet banking but limit their usage due to security concerns. Only 7% of the respondents do not use internet banking applications due to concerns about security. These results are also shown in Table 2.

Given all the news about hackers and cyber security breaches, it is surprising that so many customers of financial institutions have such faith in the cyber based applications. This is a positive for banks and

credit unions as it suggests that they are doing an excellent job thwarting the threats or at the least, assuaging the fears.

### **Results by Age and Gender**

We examine each of these questions by the respondent's gender and by the respondent's age. We find that there is no significant difference in the general level of concern, concern using mobile applications, or concern using internet based applications between the genders. Men and women respond almost identically to these questions.

We do, however, see some significant differences between the respondents of different ages. Regarding the overall concerns with cyber security at financial institutions, not surprisingly, the youngest age group, the respondents that are less than twenty-five have the lowest selection rate, only 13%, for the choice of very concerned and taking action. While all age groups are at the same risk, this age group does not know of a time when the internet was not in existence and was not used for day to day activities so it is reasonable that they are the most comfortable with the technology and have the least amount of concern.

And following the same line of reasoning, we would expect that the oldest age group, the over fifty year old respondents would have the highest levels of concern as the technology is new and it is not how they are accustomed to operating. And the data supports this assumption, 48% of the over fifty age group chose the very concerned option.

One result that is surprising, is the age of the respondents that most often chose that they had no concerns with the overall cyber security of banks is the thirty-six to fifty year olds. 51% of this age group had no concerns with cyber security. This is a higher percentage than for the twenty-five to thirty-five and the under twenty-five age groups, which is somewhat surprising.

These results are all statistically significant and the specific data including the significance levels are shown in Table 3.

We also see some differences based on age regarding concerns with mobile applications. The differences are with the under twenty-five and over fifty age groups. 51% of the under twenty-five age group have no concerns about security with their financial institutions' mobile applications. This is higher than the overall rate of 40%. Conversely, only 15% of the over fifty age group have no concerns with security of mobile applications. Consequently, when we examine the percent of respondents that do not use their financial institutions' mobile applications due to concerns with security, we find that only 2% of the under twenty-five age group fall in this category while 27% of the over fifty group forego usage due to security concerns. Smart phones represent a new technology to the over fifty respondents while the under twenty-five age group has always had the technology available and are thus more comfortable with it. These results are shown in Table 4.

We see similar age based differences in internet banking usage. Fifty percent of the less than twenty-five age group use internet banking and have no concerns about the security of the applications. This is a higher rate than the overall population, only 40% of the overall population have no concerns. Only twenty-four percent of the over fifty age group use internet banking with no security concerns. This is consistent with the mobile application results. These results are shown in Table 5.

### **Results by Type of Financial Institution**

We next examine respondents' concern levels based on the size or type of financial institution that they use. We analyze if the concerns are greater for the customers of smaller banks or for customers of credit

unions as opposed to customers of the larger banks that may have more resources available to protect themselves from threats.

We find that the overall concern level is lowest for those that bank at regional banks than for any other size or type of financial institution. Fifty-four percent of the respondents that bank at regional banks were not concerned at all about cyber security at their financial institution. Respondents who use community banks, nationwide banks, and credit union all had a much lower rate of selecting no concerns. These results are shown in Table 6.

However, when we examine concerns with mobile and internet applications we find that the customers at the community banks are most comfortable using the services without worry of security threats. Only 19% of the community bank customers limit their usage of the mobile applications due to security concerns which is significantly lower than the overall rate of 33%. Likewise, only nineteen percent of respondents that use a community bank limit their internet banking activities due to security concerns. This is significantly lower than the overall rate of thirty-two percent and lower than respondents that use any of the other financial institutions. These results are shown in Table 7 and Table 8.

Respondents had the option of choosing “other” to describe the type of financial institution that they currently use. There were so few responses in this category that we could not obtain accurate results when testing for differences so this category is not reported.

## **CONCLUSION**

Given the number and extent of cyber-attacks on institutions in the news in the past five years we expected that people would be worried about their assets in their financial institutions. We find that a little over a third of the people surveyed had no concerns about cyber security threats at their financial institutions. Only a quarter of those surveyed were very concerned.

We find no differences in levels of concern between males and females. However, we do find significant differences based on age. Not surprisingly, the youngest age group, under twenty-five has the fewest concerns and feels the safest using both mobile (smartphone based) and internet applications for their banking needs. And the oldest age group, the over fifty age respondent’s had the most concerns. This is consistent with familiarity with the technology. The under twenty-five year olds do not treat smart phones and internet technologies as new technologies.

We expected that we would find a significant difference in concern levels based on the type or size of financial institution that the respondents use. Our expectation was that since the nationwide banks have more resources available that they might have stronger measures in place to protect from cyber threats and that this perception might be prevalent with the respondents as well. However, we find to the contrary, that the respondents that use the smaller institutions were actually less concerned than the respondents who use the nationwide institutions. We found no difference in security concerns among those respondents who use credit unions. This is good news for the smaller institutions as it suggests that concerns about security do not drive potential customers to the larger, nationwide banks.

Further research could be done to examine comfort levels with more traditional products such as credit cards, ATM cards and debit cards. Also, it would be interesting to examine security concerns in different geographies across the country. Are community and regional banks in Texas unique or does this comfort level exist in other regions as well?

## **REFERENCES**

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**Table 1: Demographics**

This table shows the number and percent of respondents based on gender, age, and type of financial institution the respondent uses. There were 195 total respondents.

		N	%
Gender			
	Male	99	50.77%
	Female	96	49.23%
Age			
	< 25	86	44.10%
	25-35	37	18.97%
	36-50	39	20.00%
	> 50	33	16.92%
Type of Institution			
	Locally owned community bank	43	22.05%
	Regional bank	22	11.28%
	Nationwide bank	97	49.74%
	Credit Union	27	13.85%
	Other	6	3.08%

**Table 2: Overall results**

This table shows the results for the entire survey population. The first section shows the results to question 2, the second section shows the results for questions 3 regarding security concerns with mobile applications, and the third section shows the results for questions 4 regarding security concerns with internet banking applications.

<b>General Thoughts</b>		
	N	%
Not concerned	71	36.41%
Concerned but no action taken	75	38.46%
Very concerned	49	25.13%
<b>Mobile Usage</b>		
Use mobile applications and have no security concerns	78	40.00%
Use mobile applications but limit usage due to security concerns	64	32.82%
Do not use mobile applications due to security concerns	20	10.26%
Do not use mobile applications but not for security reasons	23	11.79%
Institution does not offer mobile services	10	5.13%
<b>Internet Usage</b>		
Use internet banking and have no security concerns	77	39.49%
Use internet banking but limit usage due to security concerns	62	31.79%
Do not use internet banking due to security concerns	14	7.18%
Do not use internet banking but not for security concerns	36	18.46%
Institution does not offer internet banking	6	3.08%



**Table 3: Results by Age**

This table shows the results to survey question 2 by age. Panel A shows the results for the age groups < 25 and 25 to 35 years old. Panel B shows the results for the 36 to 50 and > 50 age groups. The p value from a chi square test for significance is shown in parenthesis. One asterisk indicates that the results are different at a significance level of 10%, two asterisks 5%, and three asterisks 1%.

## Panel A

	Less than 25		25 to 35	
	N	%	N	%
Not concerned	33	38.37% (0.7536)	9	24.32% (0.1562)
Concerned but no action taken	42	48.84% (0.1039)	15	40.54% (0.8119)
Very concerned	11	12.79% (0.0200)	13	35.14% (0.2073)

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## Panel B

	36 to 50		Over 50	
	N	%	N	%
Not concerned	20	51.28% (0.0820)	9	27.27% (0.3091)
Concerned but no action taken	10	25.64% (0.1286)	8	24.24% (0.1164)
Very concerned	9	23.08% (0.7865)	16	48.48% (0.0060)

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**Table 4: Concerns with Mobile Usage by Age**

This table shows the results to survey question 3 by age. Panel A shows the results for the age groups < 25 and 25 to 35 years old. Panel B shows the results for the 36 to 50 and > 50 age groups. The p value from a chi square test for significance is shown in parenthesis. One asterisk indicates that the results are different at a significance level of 10%, two asterisks 5%, and three asterisks 1%.

**Panel A**

Mobile Usage	Less than 25		25 to 35	
	N	%	N	%
Use mobile have no security concerns	44	51.16% (0.0819) *	11	29.73% (0.2389)
Use mobile but limit use due to security concerns	32	37.21% (0.4747)	15	40.54% (0.3636)
Do not use mobile due to security concerns	2	2.33% (0.0226) **	4	10.81% (0.9191)
Do not use mobile but not for security reasons	5	5.81% (0.1229)	6	16.22% (0.4559)
Institution does not offer mobile services	3	3.49% (0.5465)	1	2.70% (0.5245)

**Panel B**

	36 to 50		Over 50	
	N	%	N	%
Use mobile have no security concerns	18	46.15% (0.4757)	5	15.15% (0.0061) ***
Use mobile but limit use due to security concerns	9	23.08% (0.2305)	8	24.24% (0.3269)
Do not use mobile due to security concerns	5	12.82% (0.6361)	9	27.27% (0.0067) ***
Do not use mobile but not for security reasons	5	12.82% (0.8570)	7	21.21% (0.1389)
Institution does not offer mobile services	2	5.13% (1.0000)	4	12.12% (0.1217)

**Table 5: Concerns with Internet Application by Age**

This table shows the results to survey question 4 by age. Panel A shows the results for the age groups < 25 and 25 to 35 years old. Panel B shows the results for the 36 to 50 and > 50 age groups. The p value from a chi square test for significance is shown in parenthesis. One asterisk indicates that the results are different at a significance level of 10%, two asterisks 5%, and three asterisks 1%.

**Panel A**

Internet Usage	Less than 25		25 to 35	
	N	%	N	%
Use internet banking and have no security concerns	43	50.00% (0.1006) *	11	29.73% (0.2621)
Use internet banking but limit usage due to security concerns	24	27.91% (0.5146)	15	40.54% (0.3003)
Do not use internet banking due to security concerns	3	3.49% (0.2317)	3	8.11% (0.8425)
Do not use internet but not for security concerns	14	16.28% (0.6593)	8	21.62% (0.6531)
Institution does not offer internet banking	2	2.33% (0.7271)	0	0.00% (0.2797)

**Panel B**

Internet Usage	36 to 50		Over 50	
	N	%	N	%
Use internet banking and have no security concerns	15	38.46% (0.9047)	8	24.24% (0.0940) *
Use internet banking but limit usage due to security concerns	12	30.77% (0.8999)	11	33.33% (0.8609)
Do not use internet banking due to security concerns	3	7.69% (0.9103)	5	15.15% (0.1254)
Do not use internet but not for security concerns	7	17.95% (0.9398)	7	21.21% (0.7087)
Institution does not offer internet banking	2	5.13% (0.5199)	2	6.06% (0.3890)

**Table 6: General Concern Level by Type of Institution**

This table shows the results to survey question 2 based on the respondents' current banking institution. Panel A shows the results for the respondents that currently use either a community bank or a regional bank. Panel B shows the results for the respondents that use a bank with nationwide locations and those that use a credit union. The p value from a chi square test for significance is shown in parenthesis. One asterisk indicates that the results are different at a significance level of 10%, two asterisks 5%, and three asterisks 1%.

**Panel A**

	Community bank		Regional Bank		
	N	%	N	%	
Not concerned	15	34.88%	12	54.55%	*
		(0.8504)		(0.0971)	
Concerned but no action taken	17	39.53%	5	22.73%	
		(0.8959)		(0.1470)	
Very concerned	11	25.58%	5	22.73%	
		(0.9506)		(0.8050)	

**Panel B**

	Nationwide bank		Credit Union	
	N	%	N	%
Not concerned	34	35.05%	6	22.22%
		(0.8197)		(0.1466)
Concerned but no action taken	40	41.24%	12	44.44%
		(0.6475)		(0.5506)
Very concerned	23	23.71%	9	33.33%
		(0.7913)		(0.3631)

**Table 7 Concerns with Mobile Usage by Institution**

This table shows the results to survey question 3 based on the respondents' current banking institution. Panel A shows the results for the respondents that currently use either a community bank or a regional bank. Panel B shows the results for the respondents that use a bank with nationwide locations and those that use a credit union. The p value from a chi square test for significance is shown in parenthesis. One asterisk indicates that the results are different at a significance level of 10%, two asterisks 5%, and three asterisks 1%.

**Panel A**

Mobile Usage	Community bank		Regional Bank	
	N	%	N	%
Use mobile have no security concerns	14	32.56%	9	40.91%
		(0.3644)		(0.9343)
Use mobile but limit use due to security concerns	8	18.60%	7	31.82%
		(0.0662)	*	(0.9243)
Do not use mobile due to security concerns	5	11.63%	3	13.64%
		(0.7906)		(0.6254)
Do not use mobile but not for security reasons	10	23.26%	2	9.09%
		(0.0490)	**	(0.7065)
Institution does not offer mobile services	6	13.95%	1	4.55%
		(0.0365)	**	(0.9060)

**Panel B**

Mobile Usage	Nationwide bank		Credit Union	
	N	%	N	%
Use mobile have no security concerns	43	44.33%	9	33.33%
		(0.4793)		(0.5060)
Use mobile but limit use due to security concerns	38	39.18%	11	40.74%
		(0.2834)		(0.4148)
Do not use mobile due to security concerns	9	9.28%	3	11.11%
		(0.7924)		(0.8914)
Do not use mobile but not for security reasons	7	7.22%	2	7.41%
		(0.2249)		(0.4991)
Institution does not offer mobile services	0	0.00%	2	7.41%
		(0.0232)	**	(0.6235)

**Table 8: Concerns with Internet Application by Institution**

This table shows the results to survey question 4 based on the respondents' current banking institution. Panel A shows the results for the respondents that currently use either a community bank or a regional bank. Panel B shows the results for the respondents that use a bank with nationwide locations and those that use a credit union. The p value from a chi square test for significance is shown in parenthesis. One asterisk indicates that the results are different at a significance level of 10%, two asterisks 5%, and three asterisks 1%.

**Panel A**

Internet Usage	Community bank		Regional Bank	
	N	%	N	%
Use internet banking and have no security concerns	18	41.86% (0.7736)	7	31.82% (0.4839)
Use internet banking but limit usage due to security concerns	8	18.60% (0.0857)	9	40.91% (0.3877)
Do not use internet banking due to security concerns	6	13.95% (0.1473)	2	9.09% (0.7450)
Do not use internet but not for security concerns	9	20.93% (0.7082)	3	13.64% (0.5763)
Institution does not offer internet banking	2	4.65% (0.6041)	1	4.55% (0.7117)

**Panel B**

Internet Usage	Nationwide bank		Credit Union	
	N	%	N	%
Use internet banking and have no security concerns	41	42.27% (0.6483)	7	25.93% (0.1733)
Use internet banking but limit usage due to security concerns	33	34.02% (0.7022)	11	40.74% (0.3537)
Do not use internet banking due to security concerns	4	4.12% (0.3065)	2	7.41% (0.9658)
Do not use internet but not for security concerns	19	19.59% (0.8167)	5	18.52% (0.9943)
Institution does not offer internet banking	0	0.00% (0.0809)	2	7.41% (0.2578)

## Appendix 1

### QUESTIONNAIRE CYBER SECURITY IN BANKING

We respect your privacy and do not want you to put your name on this form nor does it involve any purchase or obligation on your part. Your responses will be very helpful in a research project. Please take a few minutes to respond to the following questions by placing an “X” following the appropriate answer.

Sex: Female \_\_\_ Male \_\_\_

Age group: Under 25 years of age \_\_\_ 25 to 35 \_\_\_ 36 to 50 \_\_\_ Over 50 years of age \_\_\_

1. Currently, I primarily bank with: (select only one)
  - a. Locally owned community bank \_\_\_
  - b. Regional community bank \_\_\_
  - c. Bank that operates nationwide \_\_\_
  - d. Credit Union \_\_\_
  - e. Other \_\_\_
  
2. Which of the following statements best describes your general thoughts regarding cyber security with your current financial institution? (Check only one)
  - a. \_\_\_ I am not concerned about cyber security with my financial institution.
  - b. \_\_\_ It concerns me, but I’ve not taken any actions to prevent threats.
  - c. \_\_\_ It is very concerning and I have taken action to protect myself from threats.
  
3. Which of the following statements best describes your mobile (phone) banking activities? (Select only one)
  - a. \_\_\_ I currently use mobile banking and have no concerns about the security of my bank’s apps.
  - b. \_\_\_ I currently use mobile banking but am concerned about security and limit my activities using the mobile app.
  - c. \_\_\_ I do not use my bank’s mobile app because I am concerned about security.
  - d. \_\_\_ I do not use my bank’s mobile app, but not for security reasons.
  - e. \_\_\_ My bank does not offer mobile banking.
  
4. Which of the following statements best describes your internet banking activities? (Select only one)
  - a. \_\_\_ I currently use internet banking and have no concerns about the security of my bank’s internet site.
  - b. \_\_\_ I currently use internet banking but am concerned about security and limit my activities using the internet.
  - c. \_\_\_ I do not use my bank’s internet capabilities because I am concerned about security.
  - d. \_\_\_ I do not use my bank’s internet capabilities, but not for security reasons.
  - e. \_\_\_ My financial institution does not offer internet capabilities.

THANK YOU FOR TAKING TIME TO ASSIST US WITH OUR RESEARCH.

Are banking customers