

Determinants of Internet Banking

Abstract

In this paper, we investigate the factors that contribute to the adoption of web-based services by credit unions in the United States. We find that credit unions adopt internet banking services when they provide a higher proportion of individual loans such as real estate loans and credit card loans and when there is increased competition from other financial institutions. We find the probability of credit unions adopting internet banking to be negatively related to penetration ratio (the ratio of number of current members to number of potential members) indicating that they adopt internet banking to attract new customers. Credit unions provide internet banking services when they serve large number of members. We also find that the probability of credit unions offering transactional internet banking is positively related to the percentage of the young population in the counties where the credit unions are located.

JEL Classification: G20, G21

Keywords: Credit unions, Informational and Interactive Internet Banking, Transactional Internet Banking

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Suggestions and Comments are Appreciated and Welcome**

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1. Introduction

Web-based financial services, such as online banking, allow banks to reduce their costs by replacing the traditional services of bank employees and eliminating the need for investments in physical bank branches¹. A bank can then pass on their savings to customers through lower interest rates on loans or higher interest rates on deposits, for example. With web-based services, customers are able to transact online in a timely and accurate manner and it allows banks to provide an additional delivery channel to offer their services. The internet broadens a bank's geographical reach and it can help the bank build its current relationship with its customer base through integrated services. There exists many important benefits to web-based financial services such as evolving the banking business model, increasing profitability and efficiency, attracting new customers, retaining the existing customer base, differentiating from the competition, and offering new products and services through the internet. As follows, web-based financial services may increase a bank's asset growth.

Credit unions in the United States provide financial services in a similar fashion as a typical bank. These credit unions can provide customers one of the three types of websites: informational, interactive, and transactional websites. An informational website is simply a platform that describes products and services, provides a brief history of the credit union, and provides a concise overview of their objectives, among other things. An interactive website is a website designed for its members to access information such as bank account or loan statements. Lastly, a transactional website is the most extensive of the three websites. Customers may buy and/or use services online.

¹ Hernando and Nieto (2007) show that the adoption of internet banking as a delivery channel leads to a reduction in a bank's overhead expenses.

For example, customers may use online bill pay to pay their credit cards, deposit money, transfer funds, and manage their credit more efficiently². In this age of technological revolution², there are still many credit unions that have made the strategic decision to not provide any web-based services to their customers. In their annual reporting of data to the National Credit Union Association (NCUA), all credit unions are required to disclose whether they have a website. If the credit union operates a website, then it also identifies which of the three categories the website belongs to. This unique data provides us with an opportunity to investigate the determinants of internet-based banking. We define a basic website as a website that is either informational or interactive. We compare the credit unions that provide web-based services (basic and transactional) with those that do not operate a website to determine the factors that increase the likelihood of adoption of web-based services at a credit union.

In this paper, we identify the factors that contribute to the adoption of web-based services by credit unions in the United States. We find that product mix (type of loan offered), competition from other financial institutions, efficiency as measured by loan to deposit ratio, size as measured by the number of members and the age of members plays a central role in deciding whether to adopt web based services. Credit unions offering products geared towards individual consumers such as mortgage and credit card loans are more likely to offer web-based services to its customers. If the product is geared towards businesses, then such products do not influence the adoption of web-based services by credit unions. We use interest rate spread (difference in average loan rate and average deposit rate) as a proxy of competition amongst banks and find that lower spreads increase the probability of web-based services at credit unions. This finding suggest that if there are several other banks and credit unions operating in the same locality as the credit union, then

² Our definition is similar to DeYoung (2005) who defines a transactional website as a website offering services such as money transfers, online payments, and reviewing account balances.

the credit union is more likely to establish web-based services either to differentiate it from other banks or to match the services offered by banks if they are already providing web-based services.

Providing web-based services to consumers has two cost components, the establishment costs and the ongoing maintenance expenses. Hence, it will be more feasible for the profitable credit unions to offer web-based services to its customers. We use net return on assets and loan-to-deposit ratio as a measure of the profitability and efficiency of credit unions. Though we don't find any influence of net return on assets on the likelihood of a credit union establishing any type of website for its customers, we find that the loan-to-deposit ratio positively affects the likelihood of a credit union establishing a transactional website.

Credit unions can provide web-based services to attract new customers especially when there is a high potential for growth in its membership. Hence, we conjecture that a higher penetration ratio (ratio of number of current customers to number of potential customers) is a negative and significant factor affecting a credit union's probability of adopting a transactional website. In other words, a credit union with a higher market share is more likely to decide not to implement costly web-based services since it already has captured a presumably significant portion of local market share. Moreover, our results show the size of the credit union (as measured by the number of members the credit union has) is also a significant factor in a credit union adopting a transactional website. A large credit union may be able to reach its customer base more efficiently through the use of a website.

The characteristics and behavior of individual customers can also influence the probability of credit unions adopting web-based services. We argue that younger generations are more accustomed to internet-based services because of their technological know-how and lower security concerns. Age also affects the adoption of technology in another way. Individuals born before the

rapid growth in personal computing could be more risk averse when it comes to transacting online. Hence, credit unions with a younger customer base are more likely to provide web-based services. Confirming our hypothesis, the test results show that credit unions with an older customer base are less likely to develop a transactional website.

We further perform robustness tests where we use a sample matching technique and identify a treatment group (credit union with website) and a control group (credit union with no website). We match the credit unions in both groups based on state, county, and size. We find that credit card and real estate loans, number of members, penetration, spread, and efficiency all remain significant factors that affects whether or not a credit union adopts a transactional website given they did not have a website. We find that penetration, spread, and efficiency are either not significant or lose/gain significance and alternate direction when a credit union from basic website updates to transactional website. We also find that spread and loan-to-deposit ratio do not seem to play a significant role in whether a credit union with a basic website adopts a transactional website.

We contribute to the literature by identifying the significant factors that influence basic and transactional website adoption by credit unions in the United States using financial data as reported by credit unions as opposed to survey data used in the literature so far. We use the credit union data from the National Credit Union Administration's (NCUA) website for the years 2000 through 2010³. In addition, we are able to differentiate the factors influencing the adoption of different types of website such as informational, interactive, and transactional websites. Our findings can be generalized to banks in the United States because of the similarities between banks and credit unions. Banks and credit unions are in the same industry and offer similar product and services.

³ For the year 2008, the NCUA does not provide data on whether credit unions have a website or not. Hence, we exclude 2008 from our analysis.

The remainder of this paper is as follows. Section 2 highlights our hypothesis for each factor. In Section 3 we provide details of the data used in this study and in section 4, we discuss the methodology and results. In Section 5 we perform robustness tests. Section 6 concludes our analysis with an overview of the results.

2. Hypotheses

2.1. Product Mix

We investigate if the product mix (the type of loans in the portfolio of loans) of credit unions influence its decision to adopt internet services. We argue that if credit unions offer products that are geared towards individual consumers, then it will be beneficial for the credit union to offer web-based services to its customers. If the product is geared towards businesses, where they prefer face to face interactions, then such products will not influence the adoption of web-based services by credit unions. In an early study Hannan and McDowell (1984) examine the relationship between technology adoption and several regulatory, firm, and market characteristics and show a bank's product mix can affect the adoption of technological innovations. We use the proportion of real estate loans and credit card loans as a proxy for individual consumer products and the proportion of business loans as a measure of a business product to study its effect on the probability that credit unions develop a website. The volume of individual loans, in terms of number of loans made, is much larger than the volume of business loans. It is economically efficient for credit unions to deliver the information about services through the internet where they upload information about their product mix to their websites and customers can access the information at any time. For example, a customer with an unsecured credit card and real estate loan may view his transactions online to manage his personal finances more effectively.

Hypothesis 1a: *The higher the proportion of real estate and credit card loans, the more likely a credit union is to develop a website. The proportion of business loans, do not influence the likelihood of adoption of internet banking at credit unions.*

Web-based services, such as online payments, provide customers with the ability to transact quickly (for example, pay their bills) and view their account summaries. The latter ability plays a key role in the demand for web-based services. Typically, we do not expect businesses to transact online as commonly as individuals because businesses operate on a larger scale than individuals and operate their business in person. Generally, businesses record their financial transactions in an accounting ledger and reconcile the transactions with the help of accountants. Thus, a business' need to view a summary of their daily transactions may not be as useful as an individual customer's need to view their own account summary. Based on the above argument, we hypothesize that individual loans such as real estate and credit card loans increase the probability of transactional banking at credit unions whereas business loans do not influence the probability of transactional online banking at these credit unions.

Hypothesis 1b: *The higher the proportion of real estate and credit card loans, the more likely a credit union is to develop a transactional website as compared to informational and interactive website.*

2.2. Competition

Zhu, Kraemer, and Xu (2003) find that competitive pressure is a significant driver of e-business adoption by a firm. In the context of financial institutions, we argue that if there are several other banks and credit unions operating in the same locality as the credit union, then the credit union is more likely to establish web-based services either to differentiate it from other financial institutions or to match the services offered by financial institutions if they are already

providing web-based services. One way to differentiate from the competition is to develop an easy-to-use, extensive, and effective online platform. Or, if a credit union's competitors already provide web-based services, then we expect a credit union to also provide web-based services to prevent the possibility of losing customers to their competition. A high level of competition directs management to develop strong web-based services even to the point of differentiating themselves by the user interface of the website⁴. We use the interest rate spread which is the difference in the average loan rate and average deposit rate, as a proxy for competition. The higher the spread, the lower the competition and vice versa.

Hypothesis 2a: *The more competition a credit union faces the more likely it is to develop a website.*

Hypothesis 2b: *The more competition a credit union faces the more likely it is to develop a transactional website as compared to informational and interactive websites.*

2.3. New Customers

Corrocher (2006) finds that providing services over the internet is for the purpose of attracting new customers rather than retaining the existing customer base, as it pertains to banking firms. It is plausible that credit unions have a motivation to develop websites to attract potential customers. An online platform provides potential customers with information about the credit union's products and services, policies, and demographic details such as nearby branches and ATM locations. The website can help customers make better informed decisions about the financial institution's financial health via financial statements and history during economic downturns. Such information, available online, may serve as quality measures to interested customers. The penetration ratio provided by credit unions is the ratio of number of current members to the number of potential members and it provides the proxy for the number of potential

⁴ Credit unions could differentiate themselves by providing more online services (currency exchange, wire transfers, etc.) stronger security (more data encryption), and a more solid user interface.

customers that a credit union can attract to its existing customer base. The higher the ratio, the less market there is to capture. We expect a lower penetration ratio to be associated with a higher probability of establishing a website.

Hypothesis 3a: *The lower the penetration ratio, the more likely it is to develop a website.*

Hypothesis 3b: *The lower the penetration ratio, the more likely it is to develop a transactional website as compared to informational and interactive websites.*

2.4. Financial Condition

Karakaya and Khalil (2004) provide evidence that the financial condition of a business affects the likelihood of internet adoption. Any firm including a financial institution developing a website must incur an initial investment to establish the necessary infrastructure. In addition to the initial setup costs, the institutions must also incur maintenance costs and operational costs such as IT support, connectivity support, and data encryption, to name a few. Hence, given the costs outlined above, it is intuitive that credit unions with more capital may have the ability to develop a website relative to credit unions with less capital. One measure of capital efficiency is the loan-to-deposit ratio. A higher loan-to-deposit ratio indicates the credit union is investing more of its relatively low-yielding deposits (liabilities) in loans (assets) that yield higher rates than the liabilities. Thus, a higher loan-to-deposit ratio signals more profitability given that other risks have been hedged against. For example, the previous statement may not be true if the credit union has not done its due diligence of running credit checks. Moreover, a higher ratio indicates the possibility that customers may need to transact online. We expect that the higher the loan-to-deposit ratio, the more likely it is to develop a website because the cost of website development may be covered by retained earnings and maintained with current and future profitability. Similarly, we conjecture that a higher net ROA increases the probability that a credit union offers

web-based services. In other words, the more profitable a credit union, the more likely it is to have the means to invest in its technological infrastructure. As mentioned, if developing and maintaining a website is costly, then it follows that more profitable credit unions are able to develop a website.

Hypothesis 4a: *The higher a credit union's loan-to-deposit ratio and the higher a credit union's return on assets [ROA], the more likely it is to develop a web-site.*

Hypothesis 4b: *The higher a credit union's loan-to-deposit ratio and the higher a credit union's return on assets [ROA], the more likely it is to develop a transactional website relative to an informational and interactive website.*

2.5. Size

Furst, Lang, and Nolle (2000) show that bank profitability is correlated with internet banking and large banks are the first to adopt new innovations. Likewise, Courchane, Nickerson, and Sullivan (2002) suggest firms that adopt internet banking are larger relative to their rivals. Hence, there is a possibility that credit union characteristics such as size may affect the probability that a credit union develops a website. For example, large credit unions with vast networks of branches can save significantly by having a strong web-based platform that provides its members with transactional capabilities such as online deposits and transfers. The latter decreases the operational burden⁵ on a credit union's employees, increases a credit union's efficiency, and may lead to a decrease in brick and mortar investments. Thus, although incurring an initial investment cost, larger credit unions can save in money in the long-run through efficiency savings and increased profitability from lower burden. Small credit unions, such as local community credit unions, may not benefit as much if their operational burden is relatively low. In an extreme example, a one branch credit union does not benefit as much from developing a website because they will continue

⁵ Burden is defined as non-interest expense minus non-interest income. A lower burden improves profitability in the subsequent banking model. $NI = [NII - Burden - PLL][1 - T]$.

operating their one branch, conditional on the demographics of its customers. Therefore, we posit that larger credit unions are more likely to develop a website than smaller credit unions. To proxy for size, we collect data on the number of customers a credit union has. We use number of members, rather than total assets or some measure relative to total assets, because total assets is incorporated in our net ROA measure. Thus, we are able to prevent multicollinearity issues in our model.

Hypothesis 5a: *The greater the number of members the more likely that a credit union develops a website.*

Hypothesis 5b: *The greater the number of members the more likely that a credit union develops a transactional website relative to an informational and interactive website.*

2.6. Age of Members

Sathye (1999) examines the theory of perceived risk and finds security concerns and lack of internet banking awareness affect the adoption of internet banking. We argue that a generational divide between a credit union's customers affects the probability that a credit union develops a website. Since older generations are more skeptical of internet financial security, they prefer to transact face-to-face rather than online. Similarly, younger generations are inclined to transact online given their relative comfort with the internet. Sathye (1999) explains that security concerns affect whether individuals participate in online banking. Thus, we argue that a credit union in a market with a higher proportion of young customers are more likely to develop a website. More specifically, such a credit union is more likely to develop a transactional website given the comfort of younger people with doing online transactions. To measure this effect of age as a binary variable, we use the U.S. census data and define young people as those whose age is less than 35years.

Hypothesis 6a: *The younger the population, the more likely that a credit union develops a website.*

Hypothesis 6b: *The younger the population, the more likely that a credit union develops a transactional website relative to an informational and interactive website.*

3. Data

We collect yearly credit union data from the National Credit Union Administration's (NCUA) website. The NCUA data is available beginning from 1994; however, the data available on the website adoption is available beginning in 1999. Additionally, the credit union data on the different types of websites (informational, interactive, or transactional) is available starting in 2000. Hence, we use post-2000 data for our research analysis. The NCUA data is not provided for the year 2008; hence, we exclude this year [2008] from our cross-sectional analysis. The data on the age of population is collected from the U.S. Census Bureau, Population Division. The latest release date for the population data is October 2012 where the data is available until 2010. Thus, in this study we use a nine year sample (from 2001 to 2010, excluding 2008) where there are 18,904 firm-years with no website. Per Figure 1, the number of credit unions without a website has reduced significantly from close to 2,900 in the year 2001 to about 1,250 in the year 2010. The number of credit unions with transactional websites has increased from, approximately, 700 in the year 2001 to about 2,900 credit unions in 2010. We remove the credit unions with negative spread values (where average deposit rate is higher than average loan rate) and credit unions with a penetration ratio greater than one (i.e. the number of current members is greater than the number of potential members). After removing the credit unions with data outliers, our sample for the credit unions without a website consists of 18,816 firm-years. In our sample, the number of firm-years with either informational, interactive, or transactional websites is 29,646. After removing the credit unions with a negative spread and a penetration ratio greater than one, we remain with

29,611 firm-years. The summary statistics are presented in Table 1. From the table, it is clear that credit unions with websites have a higher proportion of real estate and credit card loans. Moreover, credit unions with websites are larger, have higher net interest margins, and are more efficient.

4. Methodology & Results

Thus far, we have argued that certain factors will affect the probability that a credit union develops a website. To examine the factors that lead a credit union to develop a website, we estimate a binary logistic regression model to predict the probability that a credit union develops a website based on several covariates over the period 2001-2010, excluding 2008 when the data is unavailable. More specifically, based on our hypotheses, our statistical model specifies the probability of a credit union adopting web-based services (via a website) as a function of institution-specific, performance, and demographic variables.⁶

$$\Pr(\text{Adoption}|\text{Website}) = f(\text{real estate loans}, \text{credit card loans}, \text{business loans}, \text{spread}, \text{penetration ratio}, \text{efficiency ratio}, \text{net ROA}, \log \text{ of number of members}, \text{membership age})$$

The explanatory variables in our model are defined as:

Real estate loans = real estate loans/total assets

Credit Card Loans = credit card loans/total assets

Business loans = business loans/total assets

Spread = average interest earned on liabilities – average interest paid on deposits

Penetration Ratio = number of members/number of potential members

Loan-to-Deposit Ratio = (total loans + leases) / (totals shares + deposits)

Net ROA = net income/total assets

⁶ The logistic regressions are run as cross-sectional analyses for each year in the dataset.

Number of members = the natural log of number of members

Membership Age = percent of population over the age of 35 in the county

In the above equation, we simultaneously test for a credit union's dependence on loan portfolio, demographics, and performance for establishing web-based services. The different types of loan products help to proxy the need of customers to use online services. The various performance measures help measure the effect of profitability and efficiency on the probability of a credit union developing a website. The performance measures give some measure to the financial feasibility of adopting web-based services. The demographic factors measure the effect of certain credit union and population characteristics, such as its size and customer age, on the likelihood that a credit union develops a website. The demographic variables help proxy for demand-side factors which affect whether or not a credit union adopts web-based services. We run three variations of the above general model. The differences in the models arise from differences in the specifications of the binary dependent variables. The covariates remain the same in each model. Model 1 defines the factors that contribute to a credit union with no website developing any type of website. Similarly, model 2 specifies the probability that credit unions with a basic website develops a transactional website. In this paper we define a basic website as a website that is either informational or interactive. Lastly, model 3 specifies the probability that credit unions with no website develops a transactional website. In Tables 2, 3, and 4 we report the results from model 1, 2, and 3. That is, we examine the factors that lead a credit union to go from state 1 to state 2 e.g. from no website to a website, from basic website to transactional website and from no website to transactional website.

We also run differences-in-means tests for the entire sample and between credit unions with transactional websites versus credit unions with basic websites and between credit unions

with basic websites versus credit unions with no website. We report the results of these tests in Tables 5, 6, and 7. Lastly, as a robustness check, we use a sample matching technique and identify a treatment group (credit union with website) and a control group (credit union with no website). The credit unions in both groups are matched based on state, county, and size. To clarify, both credit unions should be located in the same state and county. In addition, the credit union in the treatment group is matched with the credit union closest in size to the credit union in the control group. In these sets of tests, the age variable is dropped because it is the same for both groups since we are matching at a state and county level. The results for various treatment groups are reported in Tables 8, 9, and 10.

4.1 Type of Loans

In Tables 2, 3, and 4, we report the results of the logistic regression for the odds that a credit union adopts any type website, that it adopts a transactional website from a basic website, and that it adopts a transactional website from no website (Model 1, 2, and 3). For the types of loans, we find that real estate loans and credit card loans are positive and highly statistically significant at the 1% level in every year of the sample period in all three regression models. We also find that the coefficient on business loans is statistically insignificant in every year of the sample period. The transactional and individual-consumer nature of real estate and credit card loans plays a significant role in leading to a creation of a website. In other words, since consumers typically check their statement balances on a daily basis or make payments online, we find evidence that individual-related loans significantly increases the probability that a credit union develops a transactional website for its clients. The results indicate that significant benefits are perceived by credit unions when credit unions having no website develops an informational, interactive, or transactional website. Additionally, we report that credit unions perceive gains when

they upgrade from having a basic website (informational or interactive) to a more complete website (transactional). From Table 6, credit unions with transactional websites have a significantly larger proportion of credit card and real estate loans than credit unions with basic websites.

4.2 Competition

In Tables 2, 3, and 4 we report the results of the effect of competition on the probability that a credit union develops a website. First, we find evidence that interest rate spread is negative and at least statistically significant at the 5% level in every year of the sample period in models 1 and 3. In model 2, the spread is negative and significant in the first half of the sample and loses significance in the second half of the sample. The result is consistent with our expectations because the lower the spread, the higher the probability that a credit union establishes a transactional website. Recall, a low spread indicates that a credit union is facing competition from other financial institutions. Thus, we find evidence that the more competition a credit union has, the more likely a credit union adopts a transactional website or any website given the credit union had no website. However, we also report that competition is not an important factor in adopting a transactional website if the credit union already operates a basic website. Thus, it seems the credit union management believes operating a basic website is sufficient when facing increasing competition.

4.3 New Customers

Next, we find that the penetration ratio is negative and statistically significant at the 1% level for every year in the sample period in all three models. We find strong evidence that the lower the penetration ratio, the more likely a credit union is to develop a transactional website or any kind of website. The finding is consistent with our hypothesis because we expect a higher penetration ratio does not motivate a credit union to develop a website since the credit union already has a high proportion of the potential customer base.

4.4 Financial Condition

As expected, we find that the loan-to-deposit ratio is positive and at least statistically significant at the 5% level for every year in the sample period, except 2010, in models 1 and 3. In other words, the more efficient a credit union, the higher the chance that it develops a transactional website or any of the three types of websites. However, model 2 provides deviation from the other two models in that the loan-to-deposit ratio is not significant in most years and the direction of the variable changes frequently.

Interestingly, the results for net ROA are ambiguous and, generally, not statistically significant in most years. We find that the direction of net ROA alternates throughout the sample period. The profitability of a credit union, in terms of net ROA, seems to behave closer to expectations in model 2 in that the variable is consistently positive in every year in the sample whereas its direction alternates in different years in models 1 and 3.

4.5 Size

We find that the number of members is positive and statistically significant at the 1% for every year in the sample in all three models. Thus, the larger the credit union the more likely it is to adopt any website or a transactional website. From Tables 5, 6, and 7, we report a positive and significant mean difference in size between the three states of technological innovation (no website, basic website, and transactional website).

4.6 Age of Members

We report the results of the proxy for membership age (proportion of members above 35 years old). We find that membership age is negative in all years in the sample period. However, in model 1, age is not significant in most years. Additionally, membership age is statistically significant in every year in model 2 and almost every year in model 3. The higher the proportion

of members over the age of 35, the less likely that a credit union develops a website. The results show there is an age gap between customers using transactional websites and customers using basic websites or no website (models 2 and 3). Thus, the effect of membership age may be conditional on the type of website that a credit union develops because older members may feel more comfortable visiting informational and/or interactive websites rather than transactional websites. This may be true since basic websites do not require any personal information from the client, therefore, they are by nature less risky than transactional websites.

5. Further Analysis

5.1 Differences-In-Means

We analyze our results from Tables 2, 3, and 4 further by examining the differences in the means of each covariate between different states i.e. between not having a website, having a basic website, and having a transactional website. Table 5 reports the differences in means of the covariates for the entire sample in three scenarios; a credit union with no website developing a basic website, a credit union with no website developing a transactional website, and a credit union with a basic website adopting a transactional website. Additionally, the differences in means of each of the covariates is reported for the three scenarios by year in Tables 6 and 7. From Table 5, we show that the differences in means are significant for the entire sample for each of the three scenarios, except net ROA. We report no significant difference between the average net ROA in any scenario. Our analysis indicates that credit unions with informational or interactive websites have a high proportion of real estate, credit card, and business loans than credit unions with no website. Similarly, credit unions with transactional websites have even higher proportions of real estate, credit card, and business loans. Additionally, the performance measures seem to indicate that credit unions with websites have more competition (lower spread) than credit unions with no

website. Further, credit unions with transactional websites have more competition than credit unions with a basic website as measured by average interest rate spread. The average net operating profit margin and loan-to-deposit ratio are significantly larger for credit unions with websites relative to credit unions with no website. Also, the average net ROA is not statistically different between credit unions with websites and credit unions without websites. The demographic variables, age of credit union and number of members, are significantly larger for credit unions with websites than credit unions without websites. The same is true for credit unions with transactional websites than credit unions with basic websites. Similarly, the proportion of customers over the age of 35 is larger for credit unions with no websites as compared to credit unions with websites. The latter results, with the exception of net ROA, are consistent with our hypotheses.

5.2 Matched-Sample Test

We report the results from our matching technique in Tables 8, 9, and 10. The results from Tables, 8, 9, and 10 are analogous to the results from Tables 2, 3 and 4, respectively. Table 8 and 10 report that credit card and real estate loans, number of members, penetration, spread, and efficiency all remain significant factors after matching based on state, county, and size that affects whether or not a credit union adopts a transactional website given they did not have a website. Table 9 reports that penetration, spread, and efficiency are either not significant or lose/gain significance and alternate direction which is consistent with the results from model 2 reported in Table 3. Once again, spread and loan-to-deposit ratio do not seem to play a significant role in whether a credit union with a basic website adopts a transactional website. Lastly, net ROA is not significant in any of the three models as previously reported.

6. Conclusion

This research paper examines the determinants that lead a credit union to establish web-based services. First, we find that real estate and credit card loans increase the likelihood that a credit union develops a website. The two covariates are statistically significant in every year of the sample in each model specification. Second, the performance measures of a credit union such as penetration ratio and spread are also significant factors that affect the likelihood of a credit union adopting a website. Curiously, net ROA (profitability) does not affect the odds of having a website in any of the models. Third, evidence supports that larger credit unions are more likely to have a website. In addition, larger credit unions are more likely to adopt a transactional website. The number of members is consistently significant in each model specification. We report that membership age is a determining factor in whether a credit union specifically establishes a transactional website. We also show that credit unions with transactional websites have larger proportions of real estate, credit card, and business loans than credit unions with basic websites and credit unions with no websites. Similarly, credit unions with transactional websites have more competition, better profit margins, lower penetration ratios, more members, and younger members than credit unions with basic or no websites

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Figure 1.
The number of credit unions conditional on the type of website adopted.

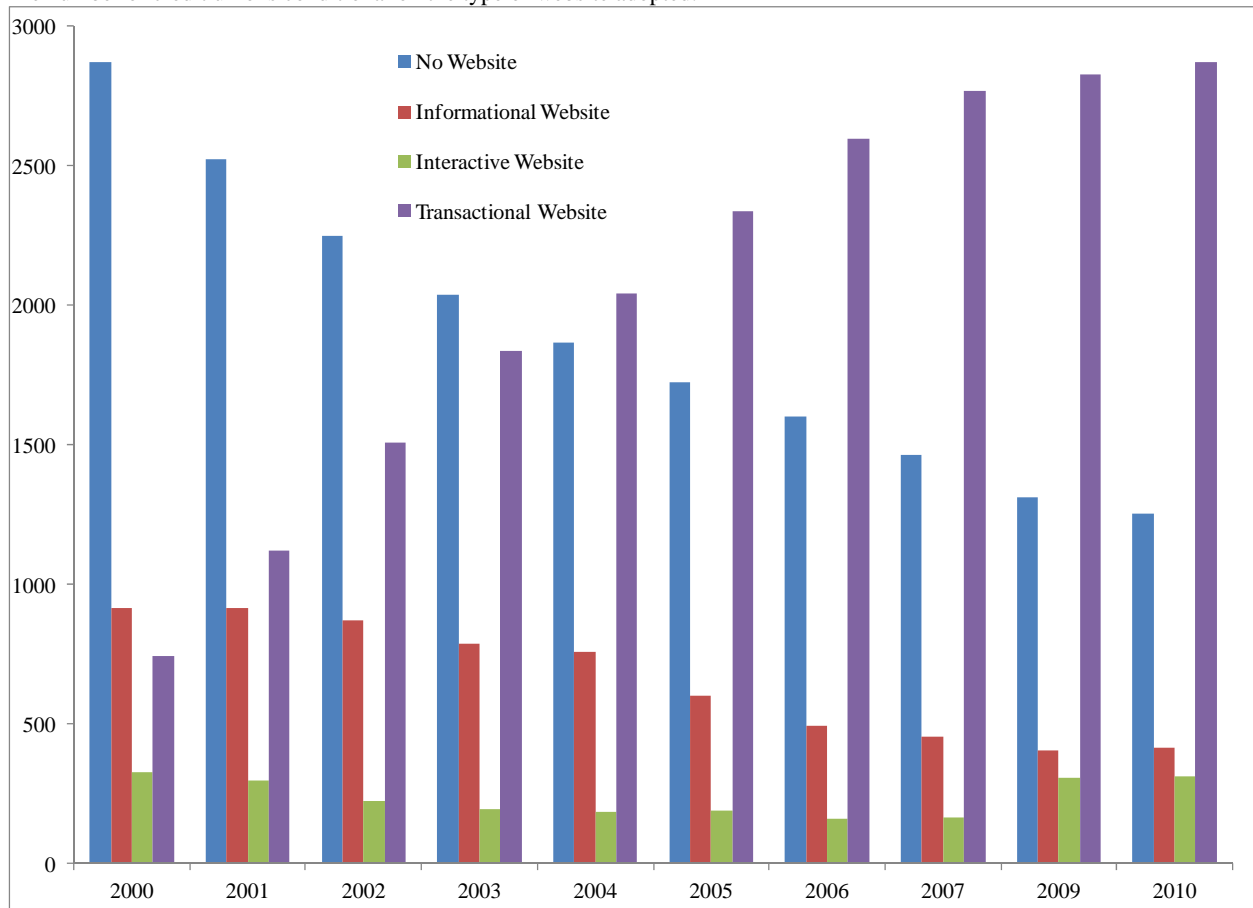


Table 1. Summary Statistics.

In Panel A, the summary statistics of credit unions with no website is provided.

	N	Mean	Std. Dev.	Minimum	Maximum
Real Estate Loans	18816	0.0503	0.0973	0	0.7769
Credit Card Loans	18816	0.0074	0.0238	0	0.5701
Business Loans	18816	0.0017	0.0200	0	0.9479
Interest Spread	18816	0.0664	0.0245	0	0.1800
Avg. Deposit Rate	18816	0.0214	0.0131	0	0.1500
Avg. Loan Rate	18816	0.0878	0.0229	0	0.1800
Net Operating Margin (000s)	18816	4.87	16.67	0	400
Size (\$MM)	18816	7.07	33.15	0.0097	2,839.67
Penetration Ratio	18798	0.5719	0.2446	0.0000	1.0000
Efficiency Ratio	18816	0.6454	0.2810	0.0013	7.1399
Age	18816	46	14	0.0000	84.0000
Net ROA	18816	0.0057	0.0160	-0.3460	1.1766
Number of Members	18816	1,446	2,390	0	136,108
% of Population > 35 years	18659	0.5234	0.0488	0.2010	0.9058

In panel B, we present the summary statistics of credit unions with any kind of website (informational, interactive, or transactional).

	N	Mean	Std Dev	Minimum	Maximum
Real Estate Loans	29611	0.2008	0.1519	0	0.8420
Credit Card Loans	29611	0.0303	0.0298	0	0.3943
Business Loans	29611	0.0097	0.0395	0	0.9502
Interest Spread	29611	0.0569	0.0141	0	0.1657
Avg. Deposit Rate	29611	0.0173	0.0100	0	0.0689
Avg. Loan Rate	29611	0.0742	0.0140	0	0.1800
Net Operating Margin (000s)	29611	127.45	470.25	0	28,000
Size (\$MM)	29611	123.36	618.34	0.032	4,419.84
Penetration Ratio	29601	0.4069	0.2704	0.0014	1.0000
Efficiency Ratio	29611	0.7024	0.1882	0.0017	2.7919
Age	29611	51	14	3.0000	93.0000
Net ROA	29611	0.0057	0.0095	-0.5327	0.4343
Number of Members	29611	15,267	59,971	104	3,637,213
% of Population > 35 years	29404	0.5217	0.0500	0.2010	0.9058

Table 2.

The results from the logistic regression of Model 1 (Any Website vs. No Website). The dependent variable equals 1 when a credit union has an informational, interactive, or transactional website and 0 when the credit union does not have a website.

	2001	2002	2003	2004	2005	2006	2007	2009	2010
INTERCEPT	-0.50	-0.39	-1.04	-1.18 ^b	-0.40	0.10	-0.27	-0.17	0.34
CREDIT CARD	15.64 ^a	22.25 ^a	23.39 ^a	16.91 ^a	15.88 ^a	19.22 ^a	15.52 ^a	15.33 ^a	16.77 ^a
REAL ESTATE	4.43 ^a	4.11 ^a	3.17 ^a	3.44 ^a	3.33 ^a	3.91 ^a	4.10 ^a	3.43 ^a	3.96 ^a
BUSINESS LOANS	-1.60	-0.93	-0.94	1.61	0.75	2.88	1.37	-0.59	0.46
% OF POP. >35 YRS.	-2.21 ^a	-1.71 ^b	-0.18	-0.11	-1.02	-1.46	-0.73	-0.64	-1.19
PENETRATION	-0.87 ^a	-0.96 ^a	-0.93 ^a	-0.97 ^a	-1.09 ^a	-1.42 ^a	-1.42 ^a	-1.27 ^a	-1.31
# MEMBERS	0.0003 ^a	0.0004 ^a	0.0005 ^a	0.0006 ^a	0.0007 ^a	0.0007 ^a	0.0008 ^a	0.001 ^a	0.001 ^a
AVG. INT. SPREAD	-6.05 ^b	-11.01 ^a	-13.57 ^a	-13.76 ^a	-13.89 ^a	-11.71 ^a	-10.87 ^a	-13.95 ^a	-13.55 ^a
LOAN-TO-DEPOSIT	0.36 ^c	0.44 ^b	0.61 ^a	0.84 ^a	0.69 ^a	0.61 ^a	0.59 ^a	0.50 ^a	0.23
NET ROA	0.23	5.43	5.95	-4.84	-4.01	-0.51	-2.71	-3.33	-0.42
NUMBER OF OBS	4815	4784	4811	4816	4811	4817	4816	4780	4770
-2 LOG L	3913.92	3756.63	3580.54	3429.15	3339.91	3257.0	3168.75	2708.27	2626.81

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 3.

The results from the logistic regression of Model 2 (Transactional vs. Basic). The dependent variable equals 1 when the credit union operates a transactional website and 0 when the credit union operates an informational or interactive website.

	2001	2002	2003	2004	2005	2006	2007	2009	2010
INTERCEPT	1.88 ^a	1.37 ^b	2.74 ^a	1.54 ^a	1.48 ^b	1.60 ^a	0.99	2.69 ^a	2.71 ^a
CREDIT CARD	9.62 ^a	8.49 ^a	10.26 ^a	9.40 ^a	11.46 ^a	9.95 ^a	11.89 ^a	12.20 ^a	13.12 ^a
REAL ESTATE	3.02 ^a	2.04 ^a	2.21 ^a	2.38 ^a	2.85 ^a	2.88 ^a	2.73 ^a	3.63 ^a	2.85 ^a
BUSINESS LOANS	-1.09	-0.86	-0.47	-0.05	-0.36	0.07	-0.47	4.24 ^b	3.15 ^c
% OF POP. >35 YRS	-4.84 ^a	-3.47 ^a	-4.58 ^a	-3.18 ^a	-2.92 ^a	-2.79 ^a	-2.12 ^a	-2.64 ^a	-2.44 ^a
PENETRATION	-0.3	-0.55 ^a	-0.81 ^a	-0.64 ^a	-0.55 ^a	-0.70 ^a	-0.45 ^a	-1.01 ^a	-0.99 ^a
# OF MEMBERS	0.00005 ^a	0.00007 ^a	0.00009 ^a	0.0001 ^a	0.0001 ^a	0.0001 ^a	0.0003 ^a	0.00003 ^a	0.00006 ^a
AVG. INT. SPREAD	-16.25 ^a	-12.68 ^a	-14.65 ^a	-8.48 ^b	-4.44	0.49	-0.21	-1.82	-4.64
LOAN-TO-DEP.	0.40	0.72 ^b	0.48 ^c	0.42 ^c	0.34	0.13	0.16	-0.30	-0.31
NET ROA	-1.54	11.47	10.51 ^c	8.93	12.49 ^b	11.70 ^c	4.09	7.16	10.98
NUMBER OF OBS	2318	2580	2798	2962	3108	3229	3365	3502	3558
-2 LOG L	2662.36	2922.83	2923.36	3002.73	2857.27	2632.85	2426.39	3029.80	3019.15

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 4.

The results from the logistic regression of Model 3 (Transactional vs. No Website). The dependent variable equals 1 when the credit union operates a transactional website and 0 when the credit union operates an informational or interactive website.

	2001	2002	2003	2004	2005	2006	2007	2009	2010
Intercept	-0.171	-0.5776	-0.8374	-1.7886 ^b	-1.1645 ^c	0.0234	-0.1381	-0.2817	0.3258
Credit Card	16.72 ^a	24.79 ^a	27.60 ^a	19.99 ^a	19.25 ^a	22.38 ^a	18.99 ^a	18.55 ^a	20.48 ^a
Real Estate	6.03 ^a	5.12 ^a	4.21 ^a	4.76 ^a	4.27 ^a	4.78 ^a	5.04 ^a	4.13 ^a	4.81 ^a
Business Loans	-3.70	-0.77	-0.99	1.15	0.45	3.85	1.57	0.43	1.04
% of Pop. >35 yrs	-6.26 ^a	-3.86 ^a	-2.13 ^c	-1.40	-1.55	-3.04 ^a	-2.29 ^b	-1.81	-2.46 ^b
Penetration	-0.78 ^a	-1.17 ^a	-1.34 ^a	-1.15 ^a	-1.22 ^a	-1.53 ^a	-1.61 ^a	-1.55 ^a	-1.77 ^a
# of Members	0.00035 ^a	0.0004 ^a	0.00057 ^a	0.0007 ^a	0.0008 ^a	0.00076 ^a	0.00086 ^a	0.0015 ^a	0.0015 ^a
Avg. Int. Spread	-9.42 ^b	-13.46 ^a	-14.95 ^a	-13.99 ^a	-14.29 ^a	-9.15 ^a	-10.01 ^a	-13.87 ^a	-14.60 ^a
Loan-to-Dep.	0.78 ^b	0.78 ^b	0.67 ^b	1.19 ^a	0.89 ^a	0.70 ^a	0.62 ^a	0.55 ^b	0.3103
Net ROA	-4.77	12.34 ^c	13.51 ^c	-4.44	1.85	0.87	-3.49	-6.08	-0.56
Number of Obs	3613	3702	3842	3883	4024	4170	4201	4076	4052
-2 Log L	1744.53	2009.24	2075.97	2037.59	2181.99	2334.77	2279.37	1842.52	1741.90

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 5.

This table shows the differences-in-mean of each covariate between three categories of websites (none, basic, and transactional) over the entire data sample. Net profit margin is indicated in thousands and size is indicated in millions of dollars. Age refers to the number of years since the credit union's establishment.

	NO SITE (18,816)	BASIC (8,967)	TRANS (20,644)	DIFFERENCE IN MEANS		
	Mean	Mean	Mean	No vs Basic	No vs Trans	Trans vs Basic
REAL ESTATE LOANS	0.050	0.139	0.228	0.088 ^a	0.177 ^a	0.089 ^a
CREDIT CARD LOANS	0.007	0.024	0.033	0.017 ^a	0.025 ^a	0.008 ^a
BUSINESS LOANS	0.002	0.005	0.012	0.003 ^a	0.010 ^a	0.007 ^a
AVG. INT. SPREAD	0.066	0.060	0.056	-0.007 ^a	-0.011 ^a	-0.004 ^a
AVG. DEP. RATE	0.021	0.019	0.016	-0.002 ^a	-0.005 ^a	-0.003 ^a
AVG. LOAN RATE	0.088	0.079	0.072	-0.009 ^a	-0.016 ^a	-0.007 ^a
NET PROFIT MARGIN (000S)	4.87	30.56	169.54	25.67 ^a	164.67 ^a	138.98 ^a
SIZE (\$MM)	7.07	32.18	162.97	25.11 ^a	155.90 ^a	130.79 ^a
PENETRATION	0.572	0.486	0.373	-0.086 ^a	-0.199 ^a	-0.113 ^a
LOAN-TO-DEP.	0.645	0.678	0.713	0.032 ^a	0.068 ^a	0.035 ^a
AGE	46	48	53	2 ^a	7 ^a	5 ^a
NET ROA	0.006	0.006	0.006	0.000	0.000	0.000
# OF MEMBERS	1446	5497	19511	4051 ^a	18,065 ^a	14,014 ^a
% OF POP. > 35 YEARS	0.523	0.524	0.521	0.000	-0.003	-0.003

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 6.

This table shows the differences-in-mean of each covariate between credit unions with a transactional website and a basic website for each year in the data sample.

	2001	2002	2003	2004	2005	2006	2007	2009	2010
REAL ESTATE LOANS	0.08 ^a	0.07 ^a	0.08 ^a	0.09 ^a	0.11 ^a	0.11 ^a	0.12 ^a	0.11 ^a	0.10 ^a
CREDIT CARD LOANS	0.01 ^a	0.01 ^a	0.01 ^a	0.01 ^a	0.01 ^a	0.01 ^a	0.02 ^a	0.01 ^a	0.01 ^a
BUSINESS LOANS	0.0006	0.002	0.002 ^c	0.004 ^a	0.006 ^a	0.007 ^a	0.008 ^a	0.01 ^a	0.01 ^a
AVG. INT. SPREAD	-0.004 ^b	-0.004 ^a	-0.005 ^a	-0.004 ^a	-0.004 ^a	-0.003 ^a	-0.004 ^a	-0.005 ^a	-0.006 ^a
AVG. DEP. RATE	-0.001 ^a	-0.001 ^a	-0.001 ^a	-0.0001	0.001 ^a	0.001 ^a	0.001 ^b	-0.001 ^a	-0.0009 ^a
AVG. LOAN RATE	-0.005 ^a	-0.005 ^a	-0.006 ^a	-0.005 ^a	-0.003 ^a	-0.002 ^a	-0.004 ^a	-0.006 ^a	-0.007 ^a
NET PROFIT MARGIN (000S)	81.19 ^a	92.10 ^a	109.50 ^a	134.01 ^a	126.22 ^a	149.40 ^a	155.92 ^a	162.21 ^a	187.48 ^a
SIZE (\$MM)	139.37 ^a	133.17 ^a	133.24 ^a	134.00 ^a	129.69 ^a	127.64 ^a	136.29 ^a	127.83 ^a	147.90 ^a
PENETRATION	-0.03 ^a	-0.06 ^a	-0.09 ^a	-0.10 ^a	-0.10 ^a	-0.12 ^a	-0.12 ^a	-0.12 ^a	-0.13 ^a
LOAN-TO-DEP.	0.04 ^a	0.05 ^a	0.06 ^a	0.07 ^a	0.06 ^a	0.05 ^a	0.04 ^a	0.06 ^a	0.06 ^a
AGE	3.09 ^a	2.72 ^a	3.10 ^a	3.61 ^a	3.49 ^a	3.55 ^a	4.35 ^a	3.82 ^a	3.92 ^a
NET ROA	0.0006 ^a	0.001 ^a	0.001 ^a	0.002 ^a	0.002 ^a	0.0008 ^b	0.0004	0.001 ^b	0.003 ^a
# OF MEMBERS	19,107 ^a	16,971 ^a	16,008 ^a	15,526 ^a	14,781 ^a	14,183 ^a	14,645 ^a	12,874 ^a	13,871 ^a
% OF POP. > 35 YEARS	-0.01 ^a	-0.01 ^a	-0.01 ^a	-0.009 ^a	-0.008 ^a	-0.008 ^a	-0.007 ^a	-0.006 ^a	-0.006 ^a

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 7.

This table shows the differences-in-mean of each covariate between credit unions with a basic website and no website for each year in the data sample.

	2001	2002	2003	2004	2005	2006	2007	2009	2010
Real Estate Loans	0.095 ^a	0.092 ^a	0.084 ^a	0.088 ^a	0.081 ^a	0.082 ^a	0.073 ^a	0.083 ^a	-0.011 ^a
Credit Card Loans	0.022 ^a	0.02 ^a	0.016 ^a	0.014 ^a	0.013 ^a	0.013 ^a	0.010 ^a	0.012 ^a	-0.007 ^a
Business Loans	0.002 ^b	0.003 ^a	0.003 ^b	0.005 ^a	0.005 ^a	0.004 ^a	0.004 ^b	0.003 ^a	0.002 ^a
Avg. Int. Spread	-0.004 ^a	-0.006 ^a	-0.008 ^a	-0.008 ^a	-0.008 ^a	-0.008 ^a	-0.008 ^a	-0.010 ^a	-0.002 ^a
Avg. Dep. Rate	-0.004 ^a	-0.003 ^a	-0.003 ^a	-0.002 ^a	-0.0005	0.0008 ^c	0.0003	-0.0007 ^b	0.004 ^a
Avg. Loan Rate	-0.008 ^a	-0.009 ^a	-0.010 ^a	-0.010 ^a	-0.009 ^a	-0.007 ^a	-0.007 ^a	-0.010 ^a	0.002 ^a
Net Profit Margin (000s)	25.07 ^a	20.50 ^a	17.05 ^a	26.11 ^a	33.62 ^a	19.52 ^a	18.52 ^a	34.47 ^a	-.98 ^a
Size (\$MM)	31.12 ^a	25.28 ^a	20.49 ^a	18.67 ^a	16.23 ^a	12.70 ^a	8.67 ^a	38.02 ^a	-12.58 ^a
Penetration	-0.08 ^a	-0.08 ^a	-0.08 ^a	-0.09 ^a	-0.09 ^a	-0.10 ^a	-0.09 ^a	-0.10 ^a	-0.01 ^a
Loan-to-Dep.	0.03 ^a	0.03 ^a	0.04 ^a	0.05 ^a	0.04 ^a	0.04 ^a	0.043 ^a	0.04 ^a	0.01 ^a
Age	2.70 ^a	2.44 ^a	2.19 ^b	1.53 ^a	1.36 ^b	1.27 ^c	0.43	1.37 ^b	-1.17 ^c
Net ROA	-0.0001	0.0007 ^b	0.0008 ^b	0.0003	-0.001 ^c	-0.0003	-0.0004	0.001	-0.001 ^a
# of Members	5,640 ^a	4,303 ^a	3,422 ^a	3,083 ^a	2,652 ^a	2,207 ^a	1,489 ^a	3,598 ^a	-2,096 ^a
% of Pop. > 35 years	-0.002	-0.001	0.003*	0.003	0.001	0.001	0.002	0.002	0.002

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 8.

This table shows the results from the matched sample test between any website and no website.

	2000	2001	2002	2003	2004	2005	2006	2007	2009	2010
Intercept	-1.9888 ^a	-1.7304 ^a	-1.4284 ^a	-1.3759 ^a	-1.1674 ^a	-1.4883 ^a	-0.7692 ^a	-0.5305 ^b	-0.776 ^a	-0.6208 ^b
Credit Card	11.8846 ^a	14.1925 ^a	20.7079 ^a	23.0864 ^a	15.7751 ^a	13.1627 ^a	20.1508 ^a	16.2 ^a	17.1509 ^a	19.8355 ^a
Real Estate	3.2164 ^a	3.7387 ^a	3.6729 ^a	2.4853 ^a	2.937 ^a	3.1454 ^a	3.6244 ^a	3.8286 ^a	2.9977 ^a	3.598 ^a
Business	-1.7495	-2.0286	-0.8307	-0.5744	1.5922	0.7375	1.2836	0.3258	-1.0154	0.2775
Penetration	-0.3177	-0.7966 ^a	-0.7695 ^a	-0.8263 ^a	-0.9942 ^a	-0.878 ^a	-1.2126 ^a	-1.3218 ^a	-1.1471 ^a	-1.2707 ^a
No. Mem	0.000205 ^a	0.000264 ^a	0.00029 ^a	0.000434 ^a	0.000549 ^a	0.000582 ^a	0.00044 ^a	0.000451 ^a	0.000959 ^a	0.000938 ^a
Spread	0.5876	-0.9601	-4.6072	-7.9134 ^a	-8.6825 ^a	-2.4513	-7.1733 ^a	-7.286 ^a	-9.6331 ^a	-7.1422 ^b
Efficiency	0.45 ^c	0.6607 ^b	0.6665 ^b	0.9529 ^a	0.8788 ^a	0.6454 ^a	0.475 ^b	0.4077 ^b	0.3883 ^c	0.1255
Net ROA	-1.7423	1.3727	4.5671	2.382	-9.3161*	-3.598	-0.6626	1.8042	-2.676	0.014
No. Obs	2278	2355	2354	2376	2296	2214	2116	1978	1801	1720
-2 Log L	2319.403	2344.374	2323.942	2271.798	2195.193	2191.007	2118.26	2048.351	1718.196	1654.036

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 9.

This table shows the results from the matched sample test between transactional websites and basic websites.

	2000	2001	2002	2003	2004	2005	2006	2007	2009	2010
Intercept	-1.3941 ^b	-0.4607	-0.3081	0.0708	-0.8453 ^a	-1.1375 ^a	-1.345 ^a	-1.3413 ^a	-0.4955	-0.4287
Credit Card	5.8529 ^b	7.3651 ^a	5.6709 ^b	8.9841 ^a	9.7092 ^a	10.7269 ^a	11.373 ^a	14.6652 ^a	8.3408 ^a	10.9179 ^a
Real Estate	1.651 ^a	1.7264 ^a	1.1064 ^b	0.9078 ^c	1.2938 ^a	1.229 ^b	1.6531 ^a	1.9284 ^a	1.6393 ^a	1.1255 ^b
Business	-4.0238	-6.2339	-7.4466*	-2.3122	-1.9015	-1.1692	-1.7352	-4.3506	1.0667	1.6425
Penetration	-0.0581	-0.0972	-0.48 ^b	-1.0101 ^a	-0.6762 ^a	-0.3344	-0.2318	0.1542	-0.5348 ^b	-0.5654 ^b
No. Mem	0.000035 ^a	0.000056 ^a	0.000058 ^a	0.000063 ^a	0.000069 ^a	0.00009 ^a	0.000078 ^a	0.000087 ^a	0.00000184	0.000009009
Spread	1.5223	-13.2605 ^b	-9.1156 ^c	-12.0653 ^b	0.3206	-0.00168	6.8645	4.9341	6.6184	3.0976
Efficiency	0.2036	0.3347	0.5081	0.4127	0.4887	0.5842 ^c	0.3314	0.1044	-0.155	0.0478
Net ROA	1.9364	-16.4775	-10.5457	11.0947	-1.3031	5.9714	-3.197	1.021	3.8437	-2.5895
No. Obs	818	1050	1176	1208	1178	1064	928	892	1032	1064
-2 Log L	1029.953	1289.887	1490.133	1522.245	1501.082	1354.103	1186.732	1120.355	1390.261	1418.964

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.

Table 10.

This table shows the results from the matched sample test between transactional websites and no website.

	2000	2001	2002	2003	2004	2005	2006	2007	2009	2010
Intercept	-4.7704 ^a	-3.3126 ^a	-2.8115 ^a	-2.2939 ^a	-2.5219 ^a	-2.8494 ^a	-2.5401 ^a	-1.9262 ^a	-1.5043 ^a	-1.263 ^a
Credit Card	11.4874 ^a	14.0143 ^a	24.5915 ^a	30.2882 ^a	18.9891 ^a	19.8221 ^a	19.9568 ^a	16.1016 ^a	21.7457 ^a	25.2356 ^a
Real Estate	4.6272 ^a	5.3911 ^a	4.9723 ^a	3.558 ^a	3.9132 ^a	4.1536 ^a	3.7087 ^a	3.9778 ^a	3.7222 ^a	4.4724 ^a
Business	-3.6876	-15.5153 ^b	-8.0962	-4.5842	-3.1509	-1.6367	-3.1661	-4.4459	-0.1198	0.447
Penetration	-0.1109	-0.8537 ^b	-1.1023 ^a	-1.2753 ^a	-1.1965 ^a	-1.0147 ^a	-1.2268 ^a	-1.4354 ^a	-1.2692 ^a	-1.704 ^a
No. Mem	0.000274 ^a	0.000315 ^a	0.000365 ^a	0.000487 ^a	0.000699 ^a	0.000745 ^a	0.000914 ^a	0.00105 ^a	0.00114 ^a	0.00116 ^a
Spread	14.4378 ^c	3.0302	-4.3207	-8.8483 ^c	-10.4776 ^b	-0.9824	-4.5342	-8.0671 ^a	-10.5833 ^a	-8.2468 ^b
Efficiency	0.7231	0.8174	1.1662 ^a	1.1544 ^a	1.6315 ^a	1.0151 ^a	0.9314 ^a	0.5243 ^b	0.33	0.0767
Net ROA	17.2669	9.2649	15.035	11.9973	-13.7809	2.5087	-3.6131	0.78	-4.0477	-0.769
No. Obs	970	1288	1520	1718	1762	1818	1792	1740	1609	1550
-2 Log L	697.709	905.789	1047.779	1186.747	1185.184	1298.016	1272.049	1252.171	1162.783	1091.463

^a Significance at the 1% level.

^b Significance at the 5% level.

^c Significance at the 10% level.