The Effect of Deposit Insurance on the Canadian Banking System

by

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ABSTRACT

This paper empirically estimates the impact of the deposit insurance coverage changes on deposit levels and growth. The analysis is based on a Canadian dataset from a variety of sources. It covers quarterly data on deposits by province and by type of banking institution over the period of 1997-2011. During this period there were eight deposit insurance coverage changes. I employ a triple difference in difference estimation strategy to take advantage of changes in coverage levels between and within provinces. I find that in a year following a provincial regulator increases the deposit insurance coverage level to unlimited, credit unions in that province experience higher deposit levels than chartered banks in that province, and credit unions in provinces with lower deposit insurance coverage limits. I also find that during the 2008 financial crisis, credit unions in provinces with unlimited coverage had higher deposit levels.

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1. INTRODUCTION

"In 2008, in response to the global financial crisis, the BC government implemented unlimited deposit insurance coverage for deposits held by BC credit unions (the previous limit was $100,000). One of the reasons for this change was to bring coverage in line with Alberta, Saskatchewan and Manitoba, all of whom provide unlimited deposit insurance (BC provides a higher level of deposit coverage than federally regulated Canadian banks and credit unions in central and eastern Canada)." (British Columbia Ministry of Finance, 2015)

This paper analyzes the link between deposit insurance and the deposits attracted by the banking sector. Deposit insurance may improve the management of the banking system by reducing the system's liquidity risk. If a bank, credit union, or entire banking system is perceived to be in distress, depositors know their deposits are protected at least up to the deposit insurance limit. Hence, deposit insurance may prevent the occurrence of a panic-based crisis. While the lead quote implies that the deposit insurance coverage limit increase was related to financial instability, the second part of the quote suggests it also came about from coverage levels in neighboring provinces. This raises intrigue around the effect that this policy change had on deposits at British Columbia credit unions (which were directly affected), as well as deposits in neighboring credit union systems and commercial banks operating in British Columbia.

Motivated by the European banking crisis, Engineer, Schure, and Gillis (2013) develop a two-country model where countries compete for deposits by setting their deposit insurance levels optimally. However, Engineer et al. do not have data on deposits to test their theory. The Canadian banking system lends itself very well to study the predictions of their theory. First, Canada has perfect capital flows across provincial borders. Second, Canada has had explicit federal deposit

insurance since 1967 through the Canada Deposit Insurance Corporation (CDIC). The CDIC covers deposits at all chartered banks that have branches reaching all over the country. In addition to the CDIC, there are 10 provincial deposit insurance schemes that cover deposits at credit unions.

One of the main contributions of this paper is developing a unique dataset for the Canadian banking system. The three major components of the dataset are provincially aggregated financial statistics for the credit union and chartered bank sectors across Canada and deposit insurance coverage limit data. The credit union data was obtained from the Canadian Credit Union Association (CCUA) quarterly national system results, which reports aggregated deposits for each provincial credit union system. The chartered bank financial data was obtained from the Statistics Canada CANSIM database. This data includes aggregate deposits held in federally chartered banks, by province. Both these samples run from 1996Q4-2011Q2, primarily due to credit unions being able to incorporate federally after 2012 (Bank Act, Federal Credit Union Conversion Regulations, 2012). The main strength of this data is that the we can see the overall provincial trends of the credit union systems, and whether there was a large-scale effect on deposits during times of change. The primary weakness of this dataset is the small sample size and that the quarterly data does not fully capture the effect of a change if it occurred late in the quarter.

There were eight deposit insurance coverage changes in the data I collected, six of which were provincial increases, one was a provincial decrease, and one was a federal increase. Two coverage increases were to full coverage (unlimited guarantee), two were to $250,000, and two were to $100,000. Federal deposit insurance was $60,000 until the CDIC raised the limit to $100,000 in 2005q3. Six out of the ten provinces changed coverage during throughout the sample, and not one of the changes occurred in the same quarter. The exact dates of the coverage changes came from quotes and annual reports from the provincial regulators (see appendix). The fact that

four provinces never increased their coverage limit, and that coverage limit increases never happened in the same quarter provides additional cross sectional and time series variation.

To analyze the effect of a coverage increase on deposits, a difference in difference estimation strategy is employed, and then augmented it with a third difference. The simple difference in difference is between treated credit union and untreated credit union sectors after the coverage limit was increased. The third difference comes into play when I include the banking sectors in both the provinces that increased coverage, and the ones that did not (treated and untreated). The full triple difference in difference specification allows me to control for the within province variation (credit unions received a coverage change, chartered banks did not) and between province variation (four out of 10 provinces did not change coverage during the sample period and no coverage change happened in the exact same quarter).

There are four main findings in this paper. First, a general deposit insurance coverage limit increase does not statistically significantly affect deposit levels or deposit growth in credit union sectors or banking sectors in provinces that increased coverage. This result applies to time frames of two quarters and four quarters after a coverage limit increase. Second, by only including the "change to full" coverage change events, the difference between credit union sector and banking sector deposit levels in treated provinces is higher than in non-treated provinces, averaged over the four quarters following the policy change. Third, credit unions that change coverage to 250K experience positive and statistically significant deposit growth relative to banks and untreated provinces. Fourth, in times of crisis, the differential in deposit levels in credit unions and banks in a province with full coverage, while controlling for all credit union deposit levels was 16.1%.

The rest of the paper proceeds as follows. Section 2 is a brief literature review. Section 3 describes deposit insurance in Canada, and the six provincial coverage increases. Section 4 covers

the data, hypothesis development and empirical strategy. The empirical results are discussed in Section 5. Section 6 details a discussion of the results. Section 7 concludes.

2. LITERATURE REVIEW

Diamond and Dybvig (1983) pioneered the academic literature for deposit insurance. In the context of their paper, deposit insurance acts to prevent bank runs. If economic conditions were to deteriorate to a point where depositors no longer had faith in the banking system, deposit insurance helps mitigate those concerns by guaranteeing an agent's savings up to the predetermined limit. Gatev and Strahan (2006) find that banks have an increased supply of funds when market conditions tighten. They conclude that because of either implicit or explicit government support of banks, depositors will flow to banks in times of crisis. I empirically investigate whether jurisdictions with higher coverage limits experienced fewer losses in their deposit base during the crisis.

The principle motivation of this paper comes from Engineer et al, (2013). The authors are inspired by the 2008 European Union financial crisis, which has multiple deposit insurance jurisdictions and depositors that can migrate very easily between them. A depositor will base his decision on both the savings rate, and on coverage levels. For the individual regulator, there is a potential cost of setting the coverage level too high, namely the deadweight loss to society of funding the scheme. If limits are too high, the funding of the scheme could prove to be too costly, should a bank failure occur. Conversely, if limits are too low, depositors could move capital to higher insured banking systems, which would also contribute to increased liquidity risk in the province with the lower limit. While Engineer et al, (2013) focus on the competition between regulators, this study analyzes depositor's behavior in response to changes in coverage limits. However, given the nature of the data collected, I can test whether there are any common trends

in deposit levels or growth, prior to these coverage limit increase.

Empirical literature on coverage limits and deposits finds that after a limit increase, or the move from implicit to explicit insurance is associated with a positive effect on deposits growth. Atanasova and Li (2016), who use British Columbia bank level data, find that after British Columbia changed to full coverage, deposit growth rates at credit unions was 14.81% higher. That finding is paired with an increase of 4.49% credit union loan assets, after the policy change.

The triple difference approach in Aldunate (2017) reveals higher deposit growth for treated state banks in the US relative to national banks in the early 1900's after the passage of deposit insurance laws. Similarly, Calomiris and Jaremenski (2016) found that after deposit insurance was implemented, the insured state bank's deposits grew faster than deposits at national banks in the same state. The stark difference between these empirical studies is that the authors have bank level data, while I have provincial level aggregates. Thus, I am only able to see the large movement of the systems in response to change in coverage, as opposed to movement of deposits between institutions.

3. DEPOSIT INSURANCE IN CANADA

In Canada, deposit insurance providers differ between commercial banks and credit unions. The Office of the Superintendent of Financial Institutions (OSFI) federally regulates commercial banks and The Canada Deposit Insurance Corporation (CDIC) provides deposit insurance coverage. Prior to 2012, credit unions were subject to provincial regulations where each level of coverage was decided by the province. This is one of the reasons I concluded my sample in 2011.

As reported in Damar, Gropp and Mordel (2017) the scope of the CDIC scheme includes insuring all eligible deposits at each institution up to the coverage limit. Eligible deposits include the principal, interest, joint deposits, savings held in trust Retirement Savings Plans, Registered

Retirement Income Funds, savings held in Tax-Free Savings Accounts, and deposits held for paying realty taxes on mortgaged property.

Table 1 displays coverage across jurisdictions and captures all the coverage changes that occurred in Canada. These coverage levels were collected by a combination of reaching out for comment to each provincial regulator and sourcing annual reports from each deposit guarantee corporation (see appendix for details). Quebec, Alberta, Saskatchewan, and Manitoba did not change coverage during the sample, thus they are my control provinces for the difference in difference estimation. There were two increases of coverage to 250K, two increases to Full coverage, and two increases to around 100K. The federal government also increased coverage in 2005 to 100K. Damar, Gropp and Mordel (2017) suggests that the 2005 federal coverage increase happened to ensure relevance of the deposit insurance scheme, increase protection for consumers, and promote more competition between institutions.

All four provinces in the Maritimes changed coverage at least once over the course of my sample, and New Brunswick was the only province to lower coverage to $250,000, down from full. These four changes support the lead quote, and we can assume that regulators are aware of other provinces coverage levels, and attempt to set their home coverage levels optimally.[2]

4. DATA AND ANALYTICAL FRAMEWORK

4.1 Data

I constructed a balanced panel of aggregated provincial credit union and "bank" deposits from 1996Q4-2011Q2. My sample contains financial and non-financial statistics, which I collected from quarterly reports put together by the Canadian Credit Union Association (CCUA). The CCUA is the national credit union trade association that represents Canada's credit unions and caisses populaires. The data provided includes aggregated provincial credit union deposits, loans, assets,

total credit unions, locations, and members. This has an advantage as we get a comprehensive view of each provinces provincial system. However, the data does not break distinguish between what type of deposits they are (consumer vs wholesale, out of province vs. "domestic", time vs demand, etc.), which limits further nuanced estimation. Alongside that, we do not know the distribution of the deposits among the credit unions within the province. For example, a consolidated banking system would possibly provide depositors with more confidence than a fragmented system. Atanasova and Li (2016) found that post the 2008 British Columbia coverage change to fully guaranteed, the capital to asset ratio improved for credit unions with less market share.

The sample is constrained from 1996Q4 – 2011Q2 for two reasons. The first reason is the inconsistent accounting method the CCUA uses, which changes the aggregation of affiliated and non affiliated credit unions after 2011Q2. The affiliation refers to being a part of a league, an umbrella organization that helps smaller credit unions with marketing, HR, and security (see appendix for quote with more information). The provinces affected by this are Quebec, Ontario, New Brunswick, and Manitoba. I assume that that credit unions behave in the same way as caisses populaires and that the affiliation with the CCUA is irrelevant to depositors thus I aggregated all non-affiliated caisses populaires and credit union deposits within a province. Second, Credit Unions were able to incorporate federally in 2012, which makes them eligible for federal coverage. (Bank Act, Federal Credit Union Conversion Regulations, 2012) Thus, I conclude the sample in 2011.

The second component of my panel identified deposits in chartered banks across provinces. The data was collected from Statistics Canada (CANSIM Table 176-0074), and measures the actual deposits held in federally regulated banks within provincial borders. To ensure I was not double counting deposits held in credit unions and banks within the province, I reached out to Stats

Canada for a clarification of their data collection methodology (see appendix for explanation). Table 3 presents summary statistics for the credit union and chartered bank panel. Quebec, Ontario, and British Columbia dominate the credit union system. Credit unions in these provinces have the most members and locations. They also have deposit shares of 45%, 13%, and 19% respectively. The prominence of a credit union sector is strongest in British Columbia, Manitoba, New Brunswick, Prince Edward Island, Quebec, and Saskatchewan. All six of those provinces have a credit union system that represents over 20% of their total provincial deposits. Recall that British Columbia, New Brunswick, and Prince Edward Island all increased coverage at one point over the course of my sample, which means that relatively large proportions of these systems were being affected by these policy changes.

Figure 1 displays aggregate deposits by credit union and banking sectors. The gold bar indicates the federal increase in coverage from $60,000 to $100,00 (2005Q3), and the dashed red bars indicated the 2008 financial crisis. During the financial crisis banks experienced a decrease in deposits but credit unions remained on their upward trend. This is further motivation for inquiry about the role of higher coverage limits in influencing deposit movement during the crisis. In summary, I have constructed a balanced panel of deposits, by province and by sector. The main weakness is that the data comes in quarterly aggregated deposits which does not allow me to view movement between institutions in a province. However, I can test whether an increase in a coverage limit affected the provincial wide sector in a statistically significant way.

4.2 Hypothesis Development

This paper tests the following two hypotheses:

Hypothesis 1: Credit unions in provinces that raise coverage limits should see an increase in their deposits relative to banks in that province, and credit unions in provinces that did not increase

coverage.

Hypothesis 2: During times of crisis, credit unions in provinces with higher coverage levels will have fewer losses in deposits than provinces with lower coverage levels.

Hypothesis 1 is motivated by Engineer et, al (2013) where they postulate that a regulator may increase coverage as a response to a foreign provinces' coverage level, or as a defensive measure to maintain depositor's savings in their system. These deposits could come from new depositors, from banks within the province, or from other credit unions across Canada. If depositors are aware of the increase in the coverage limit, then credit unions in the province have become relatively more attractive compared to banks, which are subject to federal coverage limits, and credit unions in provinces with lower levels of coverage. However, if the higher coverage limit is met with a lower interest rate on deposits from the credit union sector, a risk neutral depositor would not change his or her behavior.

Gatev and Strahan (2006) motivate hypothesis 2 who provide evidence that in times of low liquidity, banks receive higher deposit inflows. Theoretical support for hypothesis 2 comes from Allen, Carletti, Goldstein, and Leonellow, (2015), who argue that depositors' awareness and trust in the deposit insurance scheme can assist in promoting financial stability and reduce the risk of bank runs in times of crisis. Furthermore, they point out that in the Diamond and Dybvig (1983) framework of government guarantees, that the mere announcement or reminder of deposit insurance has an effect and that the government is not required to make any disbursements.

4.3 Analytical Framework

The analytical framework described below attempts to overcome the typical identification concerns in a difference in difference framework, and reflect the correlation between deposit insurance coverage limit increases on deposits. A pure difference in difference result assumes that

the difference in the dependent variable between the treated group and control group would have been the same in the absence of the coverage increase. Second, the coverage increase must be exogenous. Third, the dependent variable must be statistically different for the treated group from the control group after the treatment. The main strategy of this paper employs a triple difference in difference approach, which is similar to Aldunate (2017).

Table 2 presents an outline of the three differences I take in the regressions analysis, with a goal to see if the credit union sector in the *Post Increase* window is statistically significantly different from the commercial banking sector in the treated province, as well as both the banking and credit union sector in the untreated province.

The first difference is between observations occurring in the *Post Increase* window and not occurring in the *Post Increase* window. The goal of this specification is to see if the quarters after the coverage limit increase was statistically significantly different that quarters before and after the change. *Post Increase* takes a value of 1 for 2 quarters after the policy change, and for a robustness specification, 4 quarters after the policy change. The longer I extend the *Post Increase* window, the greater the probability of picking up additional noise that is unrelated to the coverage limit increase. Thus, I only include the results from the 2 sets of *Post Increase* windows mentioned above. Equation (1) specifies the first difference.

$$Y_{s,p,t} = \beta_1 Post\ Increase_t + sector * province + time_t + \varepsilon_{s,p,t} \quad (1)$$

It should be noted that equation (1) only includes the credit union sectors that were in provinces that increased coverage in the sample, and tests whether the 2, or 4 quarter window is statistically significantly different for these respective sectors. This specification does not offer a control group to compare to and the sample size is small, thus I introduce the untreated provincial systems in equation 2.

The second difference is between treated and untreated provinces. The progression of this difference includes all credit union sectors in the sample, Equation (2) displays the classic difference in difference methodology.

$$Y_{s,p,t} = \beta_1 Treated\ Credit\ Union_p * Post\ Increase_t + \beta_2 Treated\ Credit\ Union_p + \beta_3 Post\ Increase_t\ + sector * province + time_t + \varepsilon_{s,p,t} \quad (2)$$

The third difference analyzes the difference between the credit union sector and banking sector in the treated province, relative to untreated provinces. This specification controls for the provincial differences that may have been correlated with an increase in deposit insurance. More succinctly, credit unions received the coverage limit increase but banks did not. Thus, I find the "credit union" effect of being in a treated province, relative to the differential in deposits between the credit union sector and banking sector in the untreated province. Equation (3) puts forth the triple difference in difference specification.

$$Y_{s,p,t} = \beta_1 Credit\ Union * Treated\ Province_p * Post\ Increase_t + \beta_2 Treated\ Province_p\ * Post\ Increase_t + \beta_3 Credit\ Union * Post\ Increase_t +\ sector * province + time_t + \varepsilon_{s,p,t} \quad (3)$$

Equation (3) includes all credit union and banking sectors in the sample, and analyzes the difference between the two in the treated province. *Treated Provinc*e takes a value of 1 for both the banking and credit union sectors in the sample, *Credit Union* takes a value of 1 for all banking sectors. β_1 captures the difference of the credit union sector relative to the banking sector in the province that increased coverage after controlling for all credit union sectors during the *Post Increase* window.

In terms of identification, the *province * sector* fixed effects control for the possibility that provinces that increased coverage, and credit unions in those provinces were systematically different from provinces that did not increase coverage and the banking sectors. The time fixed effects control for all the year and quarterly effects that were common to all sectors. The interaction term, *Credit Union * Post Increase*, controls for national level shocks that could have occurred at the same time as an increase in coverage, which would have affected all treated and untreated credit union sectors during those windows. *Treated Province * Post Increase* controls for provincial level shocks that may have coincided with a coverage limit increase and affected both the banking and credit union sectors in that province. For example, an increase in total household wealth could have happened in 2008 in British Columbia, which would have affected both the banking and credit union sectors in the province. Thus, I can obtain the difference between the credit union and banking sectors in the treated province, relative to untreated provinces in the final interaction. The triple interaction, *Credit Union * Treated Province *Post Increase* is the effect of being the credit union sector in a treated province after the coverage limit increase.

To further test hypothesis 1, equation 3 can be slightly modified by changing *Post Increase* to *Post Increase to Full , Post Increase to 250K , and Post Increase to 100K*. This specification breaks down the coverage limit increases into three separate models and analyzes if there is a statistically significant difference in deposits between the credit union sector and banking sector after the province increased the coverage limit to a specific level. Considering I have two events of each coverage limit increase, I can still exploit the cross sectional and time serious variation for each coverage limit increase. The interaction terms slightly change in the modified model. For example, if I consider the effect of changing to full coverage, the triple interaction term now becomes *Credit Union * Treated Province *Post Increase to Full.* This is followed by *Treated*

*Province * Post Increase to Full* and *Credit Union * Post Increase to Full*.

Equation (4) employs the same triple difference approach by analyzing the difference in credit unions in a province that had $Full_{p,t}$ coverage during the crisis.

$$Y_{s,p,t} = \beta_1 Credit\ Union * Full_{p,t} * Crisis_t + \beta_2 Full_{p,t} * Crisis_t + \beta_3 Credit\ Union * Crisis_t + sector * province + time_t + \varepsilon_{s,p,t} \quad (4)$$

$Crisis_t$ takes a value of 1 if the` observation takes place during the recession (2008q4-2009q2). *Credit Union* takes a value of 1 if the observation is the credit union sector and *Full* takes a value of 1 if the banking or credit union sector was in a province that had full coverage at the time. *Full * Crisis* controls for the possibility that both sectors in provinces with full coverage had different deposit growth during the crisis. *Credit Union * Crisis* controls for any differences between all credit unions and banks during the crisis. Thus, when all three interactions are included β_1 is interpreted as the association of full coverage in the credit union sector during the crisis, with the sum of $\beta_1 + \beta_2 + \beta_3$ representing the full effect. Lastly, $Crisis$ can be modified to *Post Crisis* which takes a value of 1 if the observation happened after the crisis (2009q3-2011q2, or *Pre Crisis* (2007q4-2008q3). These modifications test whether there was an inflow of deposits to provinces after the crisis, and analyzes what was going on prior to the official recession in Canada, which occurred in 2008q4 till 2009q2.

5. RESULTS

Section 4 is presented as follows. Table 4 and 5 reports the regression results to test hypothesis 1 using the progression from equation (1) to (3) as originally specified. Table 6 and 7 display the results from the modified equations to further test hypothesis (1). Table 8 reports the regression results from equation (4), which tests hypothesis 2. Table 4 through 7 are organized in the same

way. Table 4 and 6 uses the natural logarithm of deposits as the dependent variable and table 5 and 7 use deposit growth. Column (1) and (5) correspond to equation (1). Column (2) and (6) display equation (2). Column (3) and (7) present equation (3) without including *Credit Union * Post Increase*. Lastly, column (4) and (8) show the full triple difference specification in equation (3).

There are three main findings in tables 4 through 7, which will be discussed further in Section 5. The first finding is that there is no empirical evidence that credit unions experienced statistically significantly higher deposits or deposit growth 2 quarters after a coverage limit increase. Column (3) and (7) in Table 4 and 5 report the final triple difference in difference of the credit unions in the treated province during the post increase window. The only statistically significant result of interest is in column (7) of Table 5 where treated credit unions averaged over 4 quarters after a coverage limit increase had negative deposit growth relative to banks in the treated province. This is empirical evidence against hypothesis 1.

The second finding is that credit unions in provinces that increased their coverage limit to full experienced positive and statistically significantly higher deposits relative to banks in the treated provinces, compared to untreated provinces. This result is reported in column (3) in Table 6 and the finding is robust to 4 quarters after a coverage increase to full (column (7)). However, when I include *Credit Unions * Post Increase* in the model, the effect is washed away, as reported in column (4) and (8).

Third, when considering deposit growth in table 7 as the dependent variable, I find that the difference between credit unions and banks relative to untreated credit unions is negative and statistically significant for provinces that increased coverage to 100K, positive and statistically significant for provinces that changed to 250K, and positive but not statistically significant for provinces that changed to full coverage. It should be noted that the period 2 quarters after a

province increased coverage to full was statistically significantly different for the treated credit unions and positive and statistically significantly higher than untreated credit unions (column (2)).

Table 8 displays the results of equation which tests Hypothesis 2. During the crisis (2008q4-2009q2), credit unions did not experience a statistically significant difference in their deposit levels relative to banks (Column (1)). This finding complements Figure 1 and leads to the question whether a system with higher levels of coverage experienced higher deposit levels during the crisis. Column (1) reports that during the crisis, credit unions in provinces with full coverage had 16.1% higher deposit levels, after controlling for deposits in banks in provinces with full coverage and deposits at all credit union. This result is not robust to credit union systems that simply had coverage that was higher than the federal limit during the crisis (Column (2)).

When I consider deposit growth as the endogenous variable (Columns (3) and (4)), I find that during the crisis all credit unions had slightly higher deposits growth relative to banks. Second, I find credit unions in provinces with coverage limits higher than the federal limit had lower deposit growth. Lastly, credit unions in provinces with full coverage had no statistically significant difference in deposit growth during the crisis. These three findings for deposit growth during the crisis support the narrative that provinces with unlimited insurance on their deposits were not affected as much as systems that had equal or marginally greater coverage limits, compared to the federal limit.

6. DISCUSSION

There were three main results, two of which correspond to coverage limit increases. There is a positive effect on deposits in credit unions in provinces that change to full and a positive effect on deposit growth in credit unions in provinces that changed to 250K.

However, it could be the case that these coverage change events were not exogenous, and

that regulators respond to economic conditions around them, including other province's coverage limits (see Appendix for quotes from provincial regulators). Table 9 and 10 employ the exact same triple difference methodology but instead shifts the window to 4Q prior to each event (see Figure 2 and 3 for a visual). If there is no statistically significant difference prior to a coverage limit increase between credit unions and banks in treated provinces, relative to untreated provinces, then that provides some empirical evidence that deposit coverage limits were not a reaction to the deposit dynamics in the province. Column (4) and (8) in Table 9 reports no statistically significant difference for a general coverage limit increase on deposits or deposit growth prior to the increase. However, Table 10 reports that credit unions in provinces that changed to full coverage already had positive and statistically significant higher deposit levels prior to the increase.

There are a few possible explanations as to why I did not see statistically significant movements after a coverage limit increased. I do not have data on the spread between savings rates offered by credit unions versus banks. It could be the case that the increase in coverage was met with a decrease in the savings rate offered by credit unions. A risk neutral depositor would then be indifferent between the banking sector and the recently higher insured credit union sector. Another possible explanation is that the spread between coverage limits was not enough to incentivize depositors to switch between deposit taking institutions. Alongside that, the two changes to Full coverage were not first movers (three prairie provinces already had full coverage) thus, the increase could have been to match coverage and was not enough to increase deposits. Depositor level data would be a nice complement to my dataset to analyze what the average account dollar value was. If, on average, a depositor held less than $100,000 then the move to $250,000 may be irrelevant to an actual decision to move capital. The announcement may provide added confidence in terms of a signal from the government. The British Columbia Ministry of Finance (2015) reported that the

majority of BC credit union members hold deposits of less than $100,000 but there are a significant number of individual members who have deposits above that amount (e.g., those selling their home or with registered retirement savings of more than $100,000 held with one institution). Thus, even though most depositors would not need the coverage boost, the reduced uncertainty around their savings from the increase could have mitigated an outflow.

A second explanation for an absence of an effect could be that depositors were not immediately aware of the coverage limit increase and could delay their decision by multiple quarters. I attempted to account for this by increasing the *Post Increase* window by 4 quarters, but found no additional support for hypotheses 1.

In fact, depositors may only incorporate deposit insurance coverage during times of financial system instability. Recall the results from table (8), which reported that credit unions in provinces that had full coverage during the crisis, had positive and statistically significantly higher deposit levels. I compare these findings to the results in Table 11, which uses the same difference in difference methodology but changes *Crisis* to *Pre Crisis* and looks for the difference in deposits between provinces with different coverage levels. The year prior to the 2008 financial crisis, did not see a statistically significant difference in deposits for credit unions in provinces with full coverage, but saw positive and statistically significantly higher deposit growth in those same sectors. Column (2) in table 11 reports that credit unions in provinces with coverage limits that are higher than the federal limit had 5.95% higher deposit levels, while banks in those provinces had -6.44% levels, relative to provincial systems with equal coverage as the federal limit (which was 100K at the time). These two results offer empirical support for conclusions by Gatev and Strahan (2006), that depositors save with banks in times of crisis, and furthermore suggests that the more attractive coverage limits offered by credit unions could have played a role in the decision making

process.

To further test the impacts of the crisis on deposits and the role of deposit insurance, I modified model 2 by switching *Crisis* to *Post Crisis*, which takes a value of 1 from 2009q3-2011q2 (end of the panel). Table 9 analyzes the same variables to see if the trends during the crisis persisted. Column (1) reports that credit unions in provinces with full coverage continued to have higher deposit levels, and that credit unions overall had lower deposit levels relative to banks after the crisis. I interpret this as banks regaining their dominance over deposits after the uncertainty around the financial stability of the banking system diminished.

Lastly, the 2005 federal increase from 60K to 100K is an event that can offer empirical support for Hypothesis 1. In this instance, the banking sector is the "treated" sector and the increase effect all ten of the provincial banking sectors. Thus, we lose one difference. However, I ran a simple difference in difference that analyzed whether the year (4q post) after the change saw a boost to deposits in the banking sector. Table 13 reports these results and I find that banks actually had statistically significantly lower deposit levels relative to credit unions both pre and post the federal limit increase. Thus, I cannot conclude that the increase in the limit resulted in more deposits for banks. A possible explanation, which is consistent with my earlier explanations, is that the change from 60K to 100K was not enough to sway depositors away from their original deposit location. Moreover, multiple provinces had 250K or Full coverage at the time, thus the increase was not the highest compared to neighboring provinces coverage limits.

7. CONCLUSION

The broad aim of this study is to test the empirical importance of the theory during "normal times" and when the system faces challenges, which potentially was the case in Canada during the 2008 financial crisis. This study provides two contributions to the literature. First, I created a unique

dataset consisting of provincially aggregated deposits in the banking and credit union sectors across Canada. The dataset also included the deposit insurance coverage limits in each province and the federal limit. The second contribution are the results from my regression analysis where I provide some empirical evidence for the association between changes in coverage limits and deposits.

I employ a triple difference in difference estimation strategy to analyze the effect of deposit insurance levels on the distribution of deposits over the Canadian Banking system. An advantage of using the Canadian banking system for my empirical strategy is that it features ten provincial regulators responsible for setting deposit insurance levels for credit unions, as well as a federal regulator responsible for chartered banks. At the same time deposits can flow freely across jurisdictions. Furthermore, changes to deposit insurance levels took place in the time span my dataset covers, which was 1996q4-2011q2. Specifically, six different provincial regulators raised coverage levels, and these increases all occurred at different times. Consequently, I use both time series and cross sectional variation to analyze the effect of a deposit coverage level increase. In addition, because chartered banks are not subject to provincial regulation, I can control for provincial wide shocks that may have coincided with an increase in coverage.

The main finding in this paper is that there is no empirical evidence for deposit insurance limit increases on deposit levels in recently higher insured credit union systems. This finding is robust to generalizing all coverage changes and separating them into the 3 unique limit increases that happened in the 2000's in Canada. However, I find that prior to the 2008 financial crisis, the credit union sector in provinces with limits that were higher than the federal limit had higher deposit levels relative to provinces that had equal coverage. Alongside that, during the 2008 financial crisis, credit unions in provinces with full coverage had statistically significantly higher

deposit levels. This provides some empirical evidence that depositors are aware of coverage limits in times of crisis, and jurisdictions with coverage limits that were higher than the federal limit did not experience statistically significant losses in their depositor base.

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Table 176-0074 - Chartered banks, regional distribution of selected assets and liabilities, at end of period, Canada, provinces and international, Bank of Canada, quarterly (dollars), CANSIM (database). (accessed: 2017)

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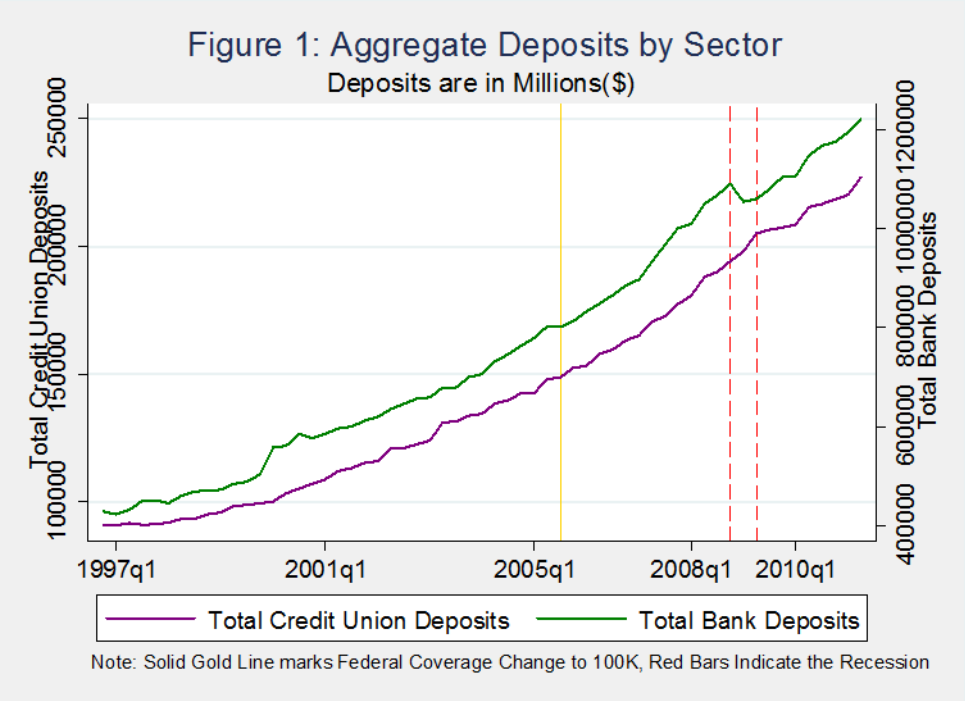
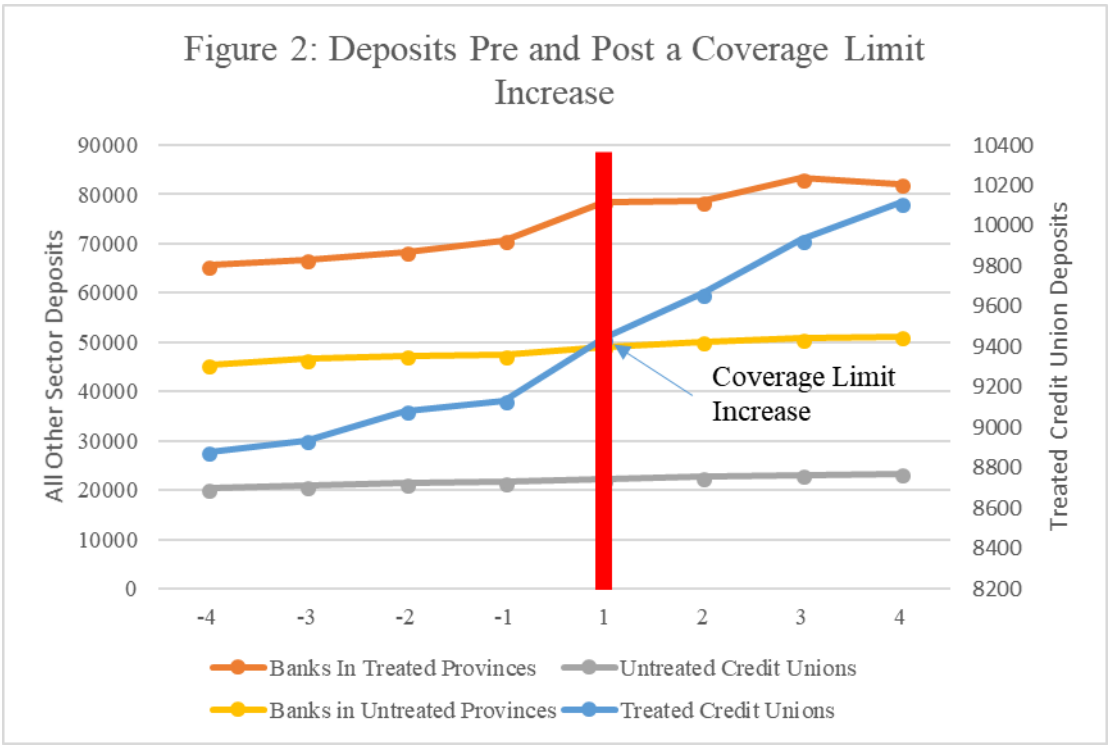
9. TABLES AND FIGURES





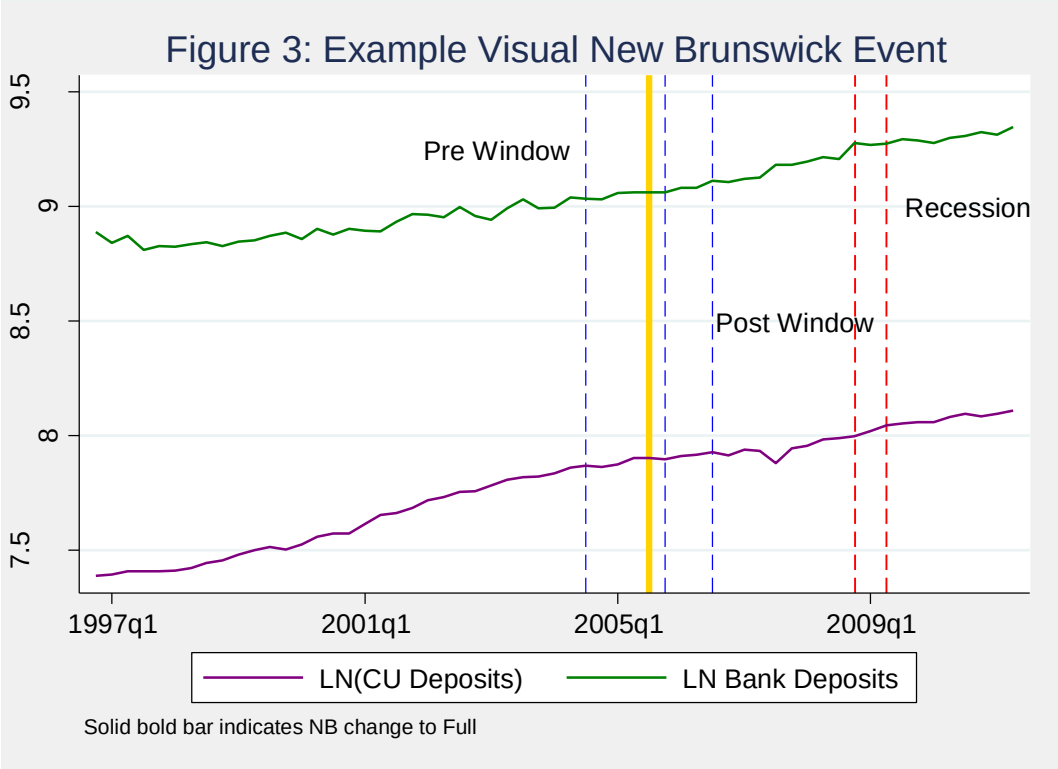


Table 1: Deposit Insurance Coverage Limits, by Jurisdiction

Institution	Jurisdiction	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Chartered Banks													
	Federal	60,000	60,000	60,000	60,000	60,000	60,000	60,000	100,000	100,000	100,000	100,000	100,000
Credit Unions													
	B.C.	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	Full	Full
	Alberta	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full
	Saskatchewan	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full
	Manitoba	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full	Full
	Ontario	60,000	60,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
	Quebec	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
	New Brunswick	100,000	100,000	100,000	100,000	100,000	100,000	100,000	Full	Full	Full	250,000	250,000
	Nova Scotia	60,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
	Newfoundland	60,000	60,000	60,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000	250,000
	Prince Edward Island	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	60,000	125,000	125,000

Table 2: An Outline of the Triple Difference in Difference Methodology

				First Difference	**Second Difference**	**Third Difference**
Row	Group	Before	After	After - Before	R1-R2 & R3-R4	R1-R3
R1	Treated Credit Unions	α_0	$\alpha_0 + \beta_t + \boldsymbol{\alpha_t}$	$\beta_t + \boldsymbol{\alpha_t}$	$\boldsymbol{\alpha_t} + \gamma_{pt}$	$\boldsymbol{\alpha_t}$
R2	Untreated Credit Unions	α_0	$\alpha_0 + \beta_t + \gamma_{pt}$	$\beta_t + \gamma_{pt}$		
R3	Banks in Treated Provinces	$\alpha_0 + \delta_0$	$\alpha_0 + \delta_0 + \beta_t$	$\delta_0 + \beta_t$	$- \gamma_{pt}$	
R4	Banks in Untreated Provinces	$\alpha_0 + \delta_0$	$\alpha_0 + \delta_0 + \beta_t + \gamma_{pt}$	$\delta_0 + \beta_t + \gamma_{pt}$		

Note: The coefficient of interest is α_t. βt are the other factors that are correlated with the time varying change. γ_{pt} are the factors that are correlated between the provinces. δ_0 is the factors that are unique to banks. The first difference is between groups before and after a coverage limit increase. The second difference is between treated and untreated credit unions. The third difference is between credit unions and banks in the province that increased coverage.

Table 3: Summary Statistics

Variable		alb	bc	mb	nb	nfl	ns	ont	pei	qb	sask
Panel A: Credit Union Sector											
Deposits	Mean	9,394	28,609	9,330	2,459	482	1,175	19,050	486	64,444	8,454
	sd	4,166	8,944	4,066	529	158	299	5,268	142	16,688	2,382
Loans	Mean	8,548	27,267	8,305	2,126	407	932	16,785	411	64,798	6,867
	sd	4,100	8,889	3,737	433	137	256	5,284	106	18,237	2,151
Assets	Mean	10,383	32,440	10,037	2,752	511	1,282	21,255	536	78,654	9,401
	sd	4,633	10,269	4,465	606	173	337	6,099	149	21,239	2,647
Total Location	Mean	199	348	204	124	39	84	721	14	1,464	326
	sd	13	16	9	4	3	3	63	1	141	12
Total Credit Unions	Mean	63	63	65	66	14	42	270	10	743	109
	sd	15	17	12	24	2	11	76	-	314	34
Members	Mean	563,476	1,536,339	512,525	295,037	41,399	165,467	1,634,800	58,861	5,169,213	546,221
	sd	71,063	105,080	71,680	14,330	5,211	3,603	33,946	5,548	138,187	30,845
Deposit Growth (%)	Mean	2.41	1.70	2.45	1.24	1.93	1.51	1.45	1.94	1.35	1.53
	sd	1.46	2.38	1.18	1.66	2.39	1.26	1.87	2.83	1.81	1.33
Provincial Depost Share (%)	Mean	11.40	22.80	34.32	22.16	6.44	8.37	4.29	21.96	39.38	35.28
	sd	0.76	0.55	6.38	1.46	0.56	0.57	0.44	2.79	0.72	1.96
Canadian Credit Union Share (%)	Mean	6.25	19.79	6.22	1.75	0.33	0.83	13.30	0.34	45.29	5.91
	sd	1.01	0.49	0.92	0.15	0.01	0.04	0.50	0.03	1.84	0.22
Panel B: Banking Sector											
Deposits	Mean	71,472	96,458	16,669	8,563	7,124	12,775	436,764	1,689	98,936	15,267
	sd	28,311	28,679	2,782	1,443	2,801	2,914	148,943	339	24,818	3,253
Loans	Mean	37,327	44,368	7,242	5,560	3,794	9,393	151,170	1,081	50,255	6,357
	sd	17,174	14,471	1,723	1,035	732	2,724	48,187	232	11,681	1,761
Deposit Growth (%)	Mean	2.04	1.51	0.82	0.79	1.77	1.17	2.09	1.02	1.34	1.07
	sd	1.98	1.88	2.26	2.55	5.53	1.64	2.91	2.64	2.41	1.62
Canadian Bank Share (%)	Mean	9.13	12.71	2.29	1.18	0.92	1.72	56.48	0.23	13.26	2.08
	sd	0.77	0.63	0.41	0.20	0.11	0.20	2.71	0.03	1.35	0.33
Observations		58	58	58	58	58	58	58	58	58	58

Note: This table reports summary statistics for the 10 provinces. Credit Union data comes from the CCUA quarterly National System Results. Chartered Bank Data comes from Stats Canada CANSIM table 176-0074. Deposits, Loans, and Assets are in millions($). Provincial Deposit Share is the ratio of Credit Union Deposits to Total Provincial Deposits. Canadian Credit Union Share is the ratio of Provincial Credit Union Deposits to Total Credit Union Deposits.

Table 4: The Effect of Deposit Insurance Coverage Limit Increases on Deposits

	2Q Post Increase Window				4Q Post Increase Window			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)
Treated Credit Union * Treated Province * Post Increase	0.0137	0.0109	0.0167	0.0258	0.0101	0.00736	0.0169	0.0252
	(0.0111)	(0.0151)	(0.0257)	(0.0283)	(0.00899)	(0.0164)	(0.0288)	(0.0317)
Treated Province * Post Increase			-0.0103	-0.0148			-0.0116	-0.0157
			(0.0216)	(0.0229)			(0.0259)	(0.0274)
Credit Union * Post Increase				-0.0110				-0.0123
				(0.00697)				(0.00902)
Constant	9.716***	9.703***	9.792***	9.793***	9.716***	9.703***	9.792***	9.794***
	(0.0503)	(0.0494)	(0.0418)	(0.0418)	(0.0503)	(0.0493)	(0.0417)	(0.0421)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Treated CU	All CU	Banks and CU	Banks and CU	Treated CU	All CU	Banks and CU	Banks and CU
Robust SE	ID	ID	ID	ID	ID	ID	ID	ID
OBS	354	590	1180	1180	354	590	1180	1180
R-SQ	0.999	0.997	0.997	0.997	0.999	0.997	0.997	0.997

Note: Table 4 displays the results from equations (1) through (3). Columns (1)-(4) show the progression of the triple difference model on the natural logarithm of deposits. Columns (5)-(8) display the same model progression but with Post Increase taking a value of 1 for 4Q after a coverage increase. Treated Province takes a value of one if the coverage changed occurred in that province for both banking and credit union sectors. Treated Credit Union takes a value of 1 for the credit union sector in the treated province. Column (1) and (5) include only treated credit unions. Column (2) and (6) add all credit unions to the sample. Column (3) and (7) include all banks. Lastly, column (4) and (8) controls for the banking sector in the treated province and analzyes difference between the credit union and banking sector through Treated Credit Union * Post Increase. Cluster robust standard errors are reported in parentheses.

* p<0.10, **p<0.05, ***p<0.01

Table 5: The Effect of Deposit Insurance Coverage Limit Increases on Deposit Growth

	2Q Post Increase Window				4Q Post Increase Window			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth
Treated Credit Union * Treated Province * Post Increase	0.00788*	0.00588	-0.00973	-0.00590	-0.000900	-0.000766	-0.00724*	-0.00699
	(0.00469)	(0.00420)	(0.00755)	(0.00962)	(0.00378)	(0.00304)	(0.00417)	(0.00563)
Treated Province * Post Increase			0.0137*	0.0118			0.00547	0.00535
			(0.00778)	(0.00887)			(0.00457)	(0.00529)
Credit Union * Post Increase				-0.00466				-0.000367
				(0.00559)				(0.00272)
Constant	0.0108	0.00641	-0.00578	-0.00537	0.0108	0.00651	-0.00563	-0.00557
	(0.00768)	(0.00534)	(0.00453)	(0.00456)	(0.00769)	(0.00533)	(0.00453)	(0.00454)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Treated CU	All CU	Banks and CU	Banks and CU	Treated CU	All CU	Banks and CU	Banks and CU
Robust SE	ID	ID	ID	ID	ID	ID	ID	ID
OBS	348	580	1160	1160	348	580	1160	1160
R-SQ	0.235	0.240	0.204	0.205	0.231	0.239	0.201	0.201

Note: Table 5 displays the results from equations (1) through (3). Columns (1)-(4) show the progression of the triple difference model on deposit growth. Columns (5)-(8) display the same model progression but with Post Increase taking a value of 1 for 4Q after a coverage increase. Treated Province takes a value of one if the coverage changed occurred in that province for both banking and credit union sectors. Treated Credit Union takes a value of 1 for the credit union sector in the treated province. Column (1) and (5) include only treated credit unions. Column (2) and (6) add all credit unions to the sample. Column (3) and (7) include all banks. Lastly, column (4) and (8) controls for the banking sector in the treated province and analzyes difference between the credit union and banking sector through Treated Credit Union * Post Increase. Cluster robust standard errors are reported in parentheses. * p<0.10, **p<0.05, ***p<0.01

Table 6: The Effect of Deposit Insurance Coverage Limit Increases

	2Q Post Increase Window				4Q Post Increase Window			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)	Ln(Deposits)
Treated Credit Union * Treated Province * Post Increase to 100K	-0.00485	-0.0152	0.00647	0.0266	-0.00886	-0.0236	0.00215	0.0198
	(0.0173)	(0.0177)	(0.0363)	(0.0376)	(0.0202)	(0.0170)	(0.0426)	(0.0356)
Treated Credit Union * Treated Province *Post Increase to 250K	0.00543	0.0297	-0.0189	0.0414	0.00148	0.0307	-0.0183	0.0357
	(0.0306)	(0.0403)	(0.0488)	(0.0592)	(0.0279)	(0.0389)	(0.0534)	(0.0627)
Treated Credit Union * Treated Province * Post Increase to Full	0.0406	0.0183	0.0627***	0.00928	0.0382	0.0143	0.0667***	0.00700
	(0.0208)	(0.0261)	(0.0175)	(0.0377)	(0.0256)	(0.0250)	(0.0204)	(0.0357)
Treated Province * Post Increase to 100K			-0.0317	-0.0418			-0.0346	-0.0434
			(0.0321)	(0.0328)			(0.0397)	(0.0338)
Treated Province * Post Increase to 250K			0.0185	-0.0117			0.0220	-0.00502
			(0.0474)	(0.0500)			(0.0527)	(0.0551)
Treated Province * Post Increase to Full			-0.0177	0.00903			-0.0225	0.00732
			(0.0184)	(0.0248)			(0.0238)	(0.0258)
Credit Union * Post Increase to 100K				-0.0217				-0.0356***
				(0.0139)				(0.0114)
Credit Union * Post Increase to 250K				-0.0605				-0.0543
				(0.0379)				(0.0368)
Credit Union * Post Increase to Full				0.0493				0.0606*
				(0.0317)				(0.0317)
Constant	9.716***	9.702***	9.791***	9.793***	9.715***	9.702***	9.789***	9.793***
	(0.0552)	(0.0490)	(0.0413)	(0.0415)	(0.0551)	(0.0484)	(0.0407)	(0.0416)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Treated CU	All CU	Banks and CU	Banks and CU	Treated CU	All CU	Banks and CU	Banks and CU
Robust SE	ID	ID	ID	ID	ID	ID	ID	ID
OBS	354	590	1180	1180	354	590	1180	1180
R-SQ	0.999	0.997	0.997	0.997	0.999	0.997	0.997	0.997

Note: Table 6 displays the results from equations (1) through (3). Columns (1)-(4) show the progression of the triple difference model on the natural logarithm of deposits. Columns (5)-(8) display the same model progression but with Post Increase taking a value of 1 for 4Q after a coverage increase. Treated Province takes a value of one if the coverage changed occurred in that province for both banks and credit unions. Treated Credit Union takes a value of 1 for the credit union sector in the treated province. Column (1) and (5) include only treated credit unions. Column (2) and (6) add all credit unions to the sample. Column (3) and (7) include all banks. Lastly, column (4) and (8) controls for the banking sector in the treated province and analzyes difference between the credit union and banking sector through Treated Credit Union * Post Increase. Cluster robust standard errors are reported in parentheses.

* p<0.10, **p<0.05, ***p<0.01

Table 7: The Effect of Unique Deposit Insurance Coverage Limit Increases on Deposit Growth

	2Q Post Increase Window				4Q Post Increase Window			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth	Deposit Growth
Treated Credit Union * Treated Province * Post Increase to 100K	0.00430	0.000753	-0.0385***	-0.0327***	-0.00358	-0.00580**	-0.0209***	-0.0153
	(0.00434)	(0.00415)	(0.00583)	(0.00675)	(0.00309)	(0.00222)	(0.00617)	(0.00938)
Treated Credit Union * Treated Province *Post Increase to 250K	0.00444	0.00516	0.00906*	0.000708	-0.00406	-0.00111	0.00160	-0.00381
	(0.00680)	(0.00370)	(0.00480)	(0.00622)	(0.00350)	(0.00227)	(0.00293)	(0.00411)
Treated Credit Union * Treated Province * Post Increase to Full	0.0149*	0.0117**	0.000264	0.0143	0.00510	0.00462	-0.00242	0.00337
	(0.00702)	(0.00493)	(0.00125)	(0.0113)	(0.00592)	(0.00562)	(0.00512)	(0.00715)
Treated Province * Post Increase to 100K			0.0364***	0.0335***			0.0123*	0.00949
			(0.00189)	(0.00216)			(0.00657)	(0.00873)
Treated Province * Post Increase to 250K			0.000271	0.00445			0.000000506	0.00270
			(0.00388)	(0.00407)			(0.00330)	(0.00351)
Treated Province * Post Increase to Full			0.00444	-0.00257			0.00415	0.00126
			(0.00592)	(0.0108)			(0.00396)	(0.00570)
Credit Union * Post Increase to 100K				-0.00657*				-0.00471
				(0.00371)				(0.00514)
Credit Union * Post Increase to 250K				0.00710				0.00429
				(0.00497)				(0.00319)
Credit Union * Post Increase to Full				-0.0145				-0.00495
				(0.0119)				(0.00541)
Constant	0.0106	0.00621	-0.00581	-0.00557	0.0104	0.00614	-0.00587	-0.00570
	(0.00795)	(0.00538)	(0.00457)	(0.00460)	(0.00798)	(0.00539)	(0.00458)	(0.00467)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Treated CU	All CU	Banks and CU	Banks and CU	Treated CU	All CU	Banks and CU	Banks and CU
Robust SE	ID	ID	ID	ID	ID	ID	ID	ID
OBS	348	580	1160	1160	348	580	1160	1160
R-SQ	0.236	0.241	0.208	0.216	0.233	0.240	0.203	0.207

Note: Table 7 displays the results from equations (1) through (3). Columns (1)-(4) show the progression of the triple difference model on deposit growth. Columns (5)-(8) display the same model progression but with Post Increase taking a value of 1 for 4Q after a coverage increase. Treated Province takes a value of one if the coverage changed occurred in that province for both banks and credit unions. Treated Credit Union takes a value of 1 for the credit union sector in the treated province. Column (1) and (5) include only treated credit unions. Column (2) and (6) add all credit unions to the sample. Column (3) and (7) include all banks. Lastly, column (4) and (8) controls for the banking sector in the treated province and analzyes difference between the credit union and banking sector through Treated Credit Union * Post Increase. Cluster robust standard errors are reported in parentheses. * p<0.10, **p<0.05, ***p<0.01

Table 8: The Effect of Provincial Deposit Insurance Coverage Levels During the Crisis

	(1) Ln(Deposits)	(2) Ln(Deposits)	(3) Deposit Growth	(4) Deposit Growth
Credit Union * Crisis	-0.0250	-0.0201	0.0000443	0.00914**
	(0.0297)	(0.0241)	(0.00406)	(0.00424)
Full * Crisis	-0.00334	0.0125	0.0161***	-0.0125
	(0.0599)	(0.0943)	(0.00554)	(0.0215)
Credit Union * Full * Crisis	0.161*	0.149	-0.00799	0.0233
	(0.0849)	(0.111)	(0.00744)	(0.0223)
Higher Than Fed * Crisis		-0.0178		0.0322
		(0.0620)		(0.0217)
Credit Union * Higher Than Fed * Crisis		0.00733		-0.0404*
		(0.0711)		(0.0226)
Constant	9.759***	9.759***	0.000412	0.000528
	(0.0382)	(0.0382)	(0.00295)	(0.00299)
Fixed Effects	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes
Robust SE	ID	ID	ID	ID
OBS	1180	1180	1160	1160
R-SQ	0.997	0.997	0.160	0.176

Note: Table 8 displays the regression results for equation (4). Crisis takes a value of 1 for observations occuring in 2008Q4-2009Q2. The Full dummy variable takes a value of 1 for the banking and credit union sector in a province with full coverage.The Higher Than Fed dummy takes a value of 1 for the banking and credit union sector in provinces with coverage that was higher than the federal limit. Column (1) and (2) analyze the differences using the natural log of deposits. Column (3) and (4) use deposit growth as the dependent variable Clustered standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 9: Examining 4Q Prior to a Coverage Increase on Deposits and Deposit Growth

	(1) Ln(Deposits)	(2) Ln(Deposits)	(3) Ln(Deposits)	(4) Ln(Deposits)	(5) Deposit Growth	(6) Deposit Growth	(7) Deposit Growth	(8) Deposit Growth
Treated Credit Union * Pre Increase	0.0197**	0.0241	0.0155	0.0469	-0.00462	-0.00535	-0.00501	-0.00314
	(0.00786)	(0.0131)	(0.0170)	(0.0376)	(0.00432)	(0.00325)	(0.00367)	(0.00426)
Treated Province * Pre Increase				-0.0328				-0.00196
				(0.0363)				(0.00249)
Constant	9.716***	9.702***	9.792***	9.791***	0.0108	0.00664	-0.00559	-0.00562
	(0.0503)	(0.0495)	(0.0419)	(0.0420)	(0.00769)	(0.00533)	(0.00458)	(0.00458)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Treated CU	All CU	Banks and CU	Banks and CU	Treated CU	All CU	Banks and CU	Banks and CU
Robust SE	ID	ID	ID	ID	ID	ID	ID	ID
OBS	354	590	1180	1180	348	580	1160	1160
R-SQ	0.999	0.997	q	0.997	0.233	0.241	0.201	0.201

Note: Table 9 displays the results from equations (1) through (3). Columns (1)-(4) show the progression of the triple difference model on deposit levels and growth. Columns (5)-(8) display the same model progression but with Pre Increase taking a value of 1 for 4Q after a coverage increase. Treated Province takes a value of one if the coverage changed occurred in that province for both banks and credit unions. Treated Credit Union takes a value of 1 for the credit union sector in the treated province. Column (1) and (5) include only treated credit unions. Column (2) and (6) add all credit unions to the sample. Column (3) and (7) include all banks. Lastly, column (4) and (8) controls for the banking sector in the treated province and analzyes difference between the credit union and banking sector through Treated Credit Union * Pre Increase. Cluster robust standard errors are reported in parentheses.

* p<0.10, **p<0.05, ***p<0.01

Table 10: Examining 4Q Prior to a Unique Coverage Increase on Deposits and Deposit Growth

	(1) Ln(Deposits)	(2) Ln(Deposits)	(3) Ln(Deposits)	(4) Ln(Deposits)	(5) Deposit Growth	(6) Deposit Growth	(7) Deposit Growth	(8) Deposit Growth
Treated Credit Union * Post Increase to 100K	0.00877	0.00699	0.00397	0.130***	-0.00840*	-0.00855	-0.00873	-0.0120*
	(0.0223)	(0.0130)	(0.0169)	(0.0151)	(0.00359)	(0.00496)	(0.00581)	(0.00643)
Treated Credit Union * Post Increase to 250K	0.0138	0.0413	-0.0147	-0.0549	-0.00305	-0.00368	-0.00195	0.00396
	(0.0305)	(0.0411)	(0.0310)	(0.0481)	(0.00461)	(0.00570)	(0.00746)	(0.00743)
Treated Credit Union * Post Increase to Full	0.0368	0.0235	0.0577**	0.0656***	-0.00250	-0.00386	-0.00440	-0.00136
	(0.0192)	(0.0285)	(0.0250)	(0.0213)	(0.00302)	(0.00344)	(0.00282)	(0.00528)
Treated Province * Post Increase to 100K				-0.133***				0.00348
				(0.00628)				(0.00377)
Treated Province * Post Increase to 250K				0.0434				-0.00622***
				(0.0496)				(0.00199)
Treated Province * Post Increase to Full				-0.00967				-0.00313
				(0.0177)				(0.00507)
Constant	9.715***	9.702***	9.789***	9.788***	0.0107	0.00653	-0.00563	-0.00567
	(0.0545)	(0.0483)	(0.0407)	(0.0408)	(0.00788)	(0.00526)	(0.00451)	(0.00452)
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sample	Treated CU	All CU	Banks and CU	Banks and CU	Treated CU	All CU	Banks and CU	Banks and CU
Robust SE	ID	ID	ID	ID	ID	ID	ID	ID
OBS	354	590	1180	1180	348	580	1160	1160
R-SQ	0.999	0.997	0.997	0.997	0.234	0.242	0.201	0.202

Note: Table 10 displays the results from equations (1) through (3). Columns (1)-(4) show the progression of the triple difference model on deposit levels and growth. Columns (5)-(8) display the same model progression but with Pre Increase taking a value of 1 for 4Q after a coverage increase. Treated Province takes a value of one if the coverage changed occurred in that province for both banks and credit unions. Treated Credit Union takes a value of 1 for the credit union sector in the treated province. Column (1) and (5) include only treated credit unions. Column (2) and (6) add all credit unions to the sample. Column (3) and (7) include all banks. Lastly, column (4) and (8) controls for the banking sector in the treated province and analzyes difference between the credit union and banking sector through Treated Credit Union * Pre Increase. Cluster robust standard errors are reported in parentheses.

* p<0.10, **p<0.05, ***p<0.01

Table 11: The Effect of Provincial Deposit Insurance Coverage Levels Prior to the Crisis

	(1) Ln(Deposits)	(2) Ln(Deposits)	(3) Deposit Growth	(4) Deposit Growth
Credit Union * Pre Crisis	0.00561	-0.00102	-0.00610	-0.00529
	(0.0241)	(0.0262)	(0.00355)	(0.00461)
Full * Pre Crisis	-0.0467	0.00902	-0.00450	-0.0111
	(0.0656)	(0.0725)	(0.00409)	(0.00679)
Credit Union * Full * Pre Crisis	0.123	0.0701	0.0128**	0.0191**
	(0.101)	(0.101)	(0.00551)	(0.00789)
Higher Than Fed * Pre Crisis		-0.0644**		0.00765
		(0.0255)		(0.00668)
Creidt Union * Higher Than Fed * Pre Crisis		0.0595*		-0.00713
		(0.0333)		(0.00807)
Constant	9.766***	9.765***	0.000930	0.00100
	(0.0367)	(0.0368)	(0.00296)	(0.00297)
Fixed Effects	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes
Robust SE	ID	ID	ID	ID
OBS	1180	1180	1160	1160
R-SQ	0.997	0.997	0.157	0.158

Note: Table 11 displays the regression results for equation (4). Pre Crisis takes a value of 1 for observations occuring in 2007Q3-2008Q4. The Full dummy variable takes a value of 1 for the banking and credit union sector in a province with full coverage.The Higher Than Fed dummy takes a value of 1 for the banking and credit union sector in provinces with coverage that was higher than the federal limit. Column (1) and (2) analyze the differences using the natural log of deposits. Column (3) and (4) use deposit growth as the depended variable. Clustered standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 12: The Effect of Provincial Deposit Insurance Coverage Levels Post the Crisis

	(1) Ln(Deposits)	(2) Ln(Deposits)	(3) Deposit Growth	(4) Deposit Growth
Credit Union * PostCrisis	-0.0353	-0.0511*	-0.00629**	-0.00763
	(0.0543)	(0.0256)	(0.00266)	(0.00643)
Full * PostCrisis	-0.00613	0.0235	-0.00261	0.00209
	(0.0761)	(0.108)	(0.00294)	(0.00585)
Credit Union * Full * PostCrisis	0.199*	0.173	0.0000592	-0.00348
	(0.103)	(0.131)	(0.00483)	(0.00703)
Higher Than Fed * PostCrisis		-0.0529		-0.00839
		(0.0762)		(0.0107)
Credit Union * Higher Than Fed * PostCrisis		0.0419		0.00487
		(0.0909)		(0.0110)
Constant	9.748***	9.746***	0.00116	0.000932
	(0.0389)	(0.0389)	(0.00291)	(0.00283)
Fixed Effects	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes
Robust SE	ID	ID	ID	ID
OBS	1180	1180	1160	1160
R-SQ	0.997	0.997	0.158	0.160

Note: Table 12 displays the regression results for equation (4). Post Crisis takes a value of 1 for observations occuring in 2009Q3-2011Q2. The Full dummy variable takes a value of 1 for the banking and credit union sector in a province with full coverage.The Higher Than Fed dummy takes a value of 1 for the banking and credit union sector in provinces with coverage that was higher than the federal limit. Column (1) and (2) analyze the differences using the natural log of deposits. Column (3) and (4) use deposit growth as the depended variable. Clustered standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table 13: The Effect of the Federal Limit Increase on Bank Deposits and Growth

	(1) Ln(Deposits)	(2) Deposit Growth	(3) Ln(Deposits)	(4) Deposit Growth
Bank * Post Fed Increase	-0.0812***	0.00102		
	(0.0259)	(0.00400)		
Bank * Pre Fed Increase			-0.0694***	0.000972
			(0.0225)	(0.00261)
Constant	9.790***	-0.00579	9.790***	-0.00580
	(0.0414)	(0.00455)	(0.0415)	(0.00456)
Fixed Effects	Yes	Yes	Yes	Yes
Time Effects	Yes	Yes	Yes	Yes
Sample	All Banks and CU	All Banks and CU	All Banks and CU	All Banks and CU
Robust SE	ID	ID	ID	ID
OBS	1180	1160	1180	1160
R-SQ	0.997	0.200	0.997	0.200

Note: Table 13 displays the results from the difference in difference estimation for the 2005q3 Federal coverage limit increase from 60K to 100K. Bank is a dummy variable that takes a value of 1 for each provincial banking sector. Post Fed Increase takes a value of 1 for the 4Q after the coverage increase. Pre Fed Increase takes a value of 1 for the 4Q prior to the coveage increase.
Clustered standard errors are reported in parentheses. * p<0.10, ** p<0.05, *** p<0.01

10. APPENDIX

1. Provincial Schemes:

a. Quote from Regulator: "In NB the Deposit Insurance Corporation for credit unions and caisses populaires was created in 1994. At that time the deposit insurance by-law was developed and to a large extent mirrored CDIC coverage including the amount of $60,000. We have had the same separate coverage as CDIC for joint deposits and trust deposits, RRSPs and RRIF."

b. "All money on deposit and money invested in non-equity shares with a BC credit union, regardless of whether it is placed directly with the credit union or through a broker, is 100 percent guaranteed by CUDIC (a statutory corporation of the BC government administered by FICOM). Personal and business accounts that are guaranteed include: savings accounts; chequing accounts; joint accounts; trust accounts; term deposits (with no limit on the length of the term to maturity); GICs (that are in the form of money on deposit with a BC credit union); foreign currency deposits; registered and tax-free savings accounts. Accrued interest on deposits is also guaranteed. Credit union equity shares and investments such as mutual funds or RRSP equity plans are not covered by deposit insurance." (BC Ministry of Finance, 2015)

2. Coverage Change Quotes:

a. Nova Scotia Change from $60,000 to $250,000

   i. "To strengthen the protection provided to credit union members, the deposit insurance coverage that is provided by the Corporation was increased to $250,000" (http://www.nscudic.org/wp-

content/uploads/2015/02/NSCUDIC-Annual-Report-1999.pdf)

ii. “Good Afternoon: The increase to $250,000 was March 1999” (Email from Regulator)

b. Ontario Coverage Change from $60,000 to $100,000

i. “DICO is pleased to advise you that the Minister of Finance has announced the following changes in deposit insurance for DICO’s member institutions effective January 1, 2000: the limit on deposit insurance coverage has been increased from $60,000 to $100,000; deposit insurance premiums are now calculated based on insured deposits instead of total deposits; and deposits with terms exceeding five years will now qualify for deposit insurance coverage.” (System Release, January 14, 2000)

c. Newfoundland Coverage Change from $60,000 to $250,000

i. Enclosed is a copy of the 2001 Annual Report you requested. On page two (2) of the enclosed report, it states when the Minister and the Government of NL increased the deposit guarantee from $60K to the present $250K.

I have also included a copy of "Insuring Deposits in Credit Unions" in the province of Newfoundland and Labrador brochure. (Email from regulator)

ii. The guarantee coverage program changed from $60,000 to $250,000.00 during the year 2001. (Email from Regulator)

d. New Brunswick Coverage Change from $100,000 to Full

   i. "In 2005, a package of reforms was introduced by the Department of Justice that amended the regulations under the Act. These reforms consisted of an increase in the level of deposit insurance protection available to members of New Brunswick credit unions and caisses populaires to an amount equal to the amount contained in the eligible deposit accounts over the previous limit of $100,000." (http://www.assurance-nb.ca/Financia-AnnualReportsl/Report2005-e.pdf)

   ii. "From 2005-2009 NB had unlimited coverage. This was done to maintain confidence in the NB credit union system given our largest credit union was experiencing serious losses. It was deemed important to increase coverage to limit the problem to this one credit union and to buy some time to resolve the problems of this credit union rather than to proceed to liquidate." (Regulator Email)

e. Prince Edward Island Coverage Change from $60,000 to $125,000

   i. In the 2008 CUDIC Annual Report, it states on Page 4 that Government passed amendments to the Credit Unions Act during the spring 2008 session of the Legislature. These amendments increased deposit insurance coverage from $60,000 to $125,000.

   ii. On Page 2 of the Report, it indicates CUDIC was established in 1992. For reference, you will find the 2007 and 2008 Annual Reports listed on our website at peicudic.com. (Email from Regulator)

f. British Columbia Coverage Change from $100,000 to Full

i. "On November 27, 2008, the Provincial legislature passed amendments to the Financial Institutions Act to provide unlimited deposit insurance protection on all deposits in British Columbia's credit unions." (http://www.cudicbc.ca/)

3. Email from StatsCanada that ensures credit unions are not double counted in Table 176-0074

a. "The R2 return is filed by federally-regulated deposit-taking institutions. Although Trust and Mortgage Loan companies are required to file this return, their data is not included in 176-0074. Credit Unions and Caisses Populaires that are not under the Bank Act do not submit this return"

4. Email to justify merging the affiliated and non affiliated credit unions from the CCUA national system results:

a. In an email from a provincial regulator, it was stated that the affiliation referred to whether credit union was a member of a league. "Interestingly, in all other provinces credit unions must be a member of a league and there is only one league (an umbrella organization that may provide various services, for example, cheque clearing, liquidity funding, trade association and back end services (e.g.,HR, marketing)."
b. Motivated by: "All credit unions and caisses populaires in Ontario are regulated and insured by DICO. In fact, DICO is required by the Credit Union and Caisse Populaire Act, 1994 to insure deposits at a credit union/caisse populaire:" (Ontario Regulator)
c. In NB the Deposit Insurance Corporation for credit unions and caisses populaires was created in 1994." (NB Regulator)
d. Quote from regulator: "From 2005-2009 NB had unlimited coverage. This was done to maintain confidence in the NB credit union system given our largest credit union was experiencing serious losses.
e. Quote from regulator: "To sum up I would say there are two variables we have used to establish coverage amounts: The coverage in the industry whether it be banks or credit unions in other jurisdictions, which is essentially to make our credit unions competitive. The need to maintain public confidence in the credit union system of NB which can, in the extreme, result in a run on deposits when there are events that impact or may impact public confidence."