The Run from Safety: How a Change to the Deposit Insurance Limit Affects Households' Portfolio Allocation*

H. Evren Damar†

Reint Gropp‡

Adi Mordel§

February 2017

Preliminary Draft: Please do not circulate

Abstract

This paper examines the effect of a change in deposit insurance limit on household portfolio allocation. We use a 2005 increase in the deposit insurance limit in Canada from 60,000 CAD to 100,000 CAD, along with detailed information on the holdings of insured and uninsured deposits at the household level. An increase in deposit insurance represents an exogenous shift towards safe assets in households' portfolios, as a larger share of deposits becomes fully insured. We document that banks consequently adjust rates on large deposits and that households respond by shifting parts of their portfolios towards riskier assets outside the banking system. This is consistent with households attempting to maintain a constant allocation between safe and risky assets, as suggested by standard asset pricing models. Overall, we estimate that about 2.7 percent of all outstanding deposits in Canada were moved to risky assets outside the banking system following the limit change.

Keywords: Deposit insurance; Banking; Households; Regulation
JEL classification: D14; G21; G28; L51

---

*The views expressed in this paper are our own and do not necessarily reflect the views of the Bank of Canada.

†Department of Economics, Hobart and William Smith Colleges, 300 Pulteney Street, Geneva, NY, USA. E-mail: damar@hws.edu, Phone: +1 (315) 781-4558, Fax: +1 (315) 781-3422

‡IWH and University of Magdeburg, Kleine Märkerstrasse 8, 06108 Halle (Saale), Germany. E-mail: reint.gropp@iwh-halle.de; Phone: +49 345 7753-700, Fax: +49 345 7753-820

§Financial Stability Department, Bank of Canada, 234 Wellington Street, Ottawa, ON, Canada. E-mail: amordel@bankofcanada.ca, Phone: +1 (613) 782-7266, Fax: +1 613 782-7010

1 Introduction

Demand and time deposits are an important component of a household's financial portfolio. For example, Badarinza et al. (2016) document that among households in eight leading industrialized countries, deposits and transaction accounts are almost universally held and on average represent between 6% and 30% of the allocated wealth in a household's portfolio of financial and nonfinancial assets. Furthermore, the strand of the household finance literature that studies portfolio decisions tends to classify deposits homogeneously, treating them essentially as cash, lumping together insured and uninsured accounts with other forms of current savings (see Guiso and Sodini (2013)).

However, in reality not all deposits are the same. Specifically, partially insured deposits, i.e. those with a total balance greater than the deposit insurance limit, are not entirely safe since in case of bank failure the amount above the deposit insurance limit can be lost. Iyer et al. (2016) document that uninsured retail depositors are indeed sensitive to the insurance limit. While uninsured depositors are exposed to more risk, they may also earn higher interest rates on these partially-insured accounts, making them a potentially attractive investment opportunity that is safer than risky assets (such as stocks) but riskier than safe assets (such as cash or fully-insured deposits).

It is also clear that during the recent financial crisis jurisdictions have utilized deposit insurance as a main tool to reduce the risk of runs. While in some deposit insurance was introduced for the first time (Australia, New Zealand), others have adjusted a pre-existing insurance limit at a temporarily higher level (Ireland, Denmark), whereas in other jurisdiction the temporary higher crisis limit became permeant later on (United States). Although there is a well-established literature on the financial stability benefits and moral hazard consequences of deposit insurance (see Allen et al. (2015) for a recent review of these issues), little is known about the *household finance implications* of changes to the deposit insurance limit, as those essentially interfere with the household's portfolio allocation decision. This paper is among the first to investigate that issue. If changes to deposit insurance coverage are associated with a rebalancing of household portfolios, this may point to deposit insurance policy generating certain tradeoffs. For example, if households are found to increase the riskiness of their portfolios in response to changes in deposit insurance coverage, the tradeoff will be between a lower risk of bank runs and a higher exposure of households to financial market tail events. Even though the overall financial stability benefits of the policy action may be positive (i.e. the lower risk of bank runs outweigh the higher risk on household portfolios), the mere presence of this tradeoff would have important policy implications.

We argue that an increase in the deposit insurance limit converts some of the uninsured deposits into insured deposits. As a consequence, the risk characteristics of the financial portfolio of the household change, with the share of safe assets in the household's portfolio going up. If the household wants to maintain a constant mixture of safe and risky assets, it would have to actively offset the exogenous change imposed by the increase in the deposit insurance limit. In addition, the return on the existing household deposits may change, because a larger share is now insured and may earn a lower return than before.

The challenge in identifying the effect of a limit change on the household's portfolio is twofold. First, one needs access to granular data that differentiate various deposits as insurance frameworks tend to be complex and are unlikely to cover all types of accounts. For instance, insurance might only apply to a specific group of depository taking institutions, or it might count differently depending on the account characteristics, such as in the case of accounts held under one person's name vs. joint-accounts held be two or more people. Second, the limit usually changes in response to a crisis, thus empirically, it becomes challenging to disentangle the effect of the policy form that of the crisis.

The data and event that we utilize in this paper allow us to overcome these difficulties. We study how a 2005 increase in the deposit insurance limit in Canada from 60,000 CAD to 100,000 CAD affected household portfolio allocation. The Canadian setting has the important advantage as the change occurred outside of a crisis period and was unrelated to the banks' risk profile or changes in the uncertainty facing households. Hence, we are able to identify the effect of the limit increase on pricing of deposits and household behavior. Our starting point is that investors split their portfolio across four product categories: insured bank deposits, uninsured bank deposits, safe assets (government bonds and money market mutual funds), and risky assets (stocks, all other bonds, and non-money market mutual funds).

We first establish that the increase in the deposit insurance limit affects the rate of return on deposits exceeding the old limit of 60,000 CAD. It is possible to think of the deposit rates on these accounts as a weighted average of the return on insured (the first 60,000 CAD) vs. uninsured (the rest) deposits. We document that once the limit increased, the rate on partially-insured deposit accounts fell and remained at a lower level at least until the end of 2006. This is consistent with the idea that the higher limit made these accounts safer by converting some of the previously uninsured deposits (namely the amount between 60,000 CAD and 100,000 CAD) into those that are insured. With a lower share of uninsured deposits in the account, the interest rate also fell. In addition, the higher deposit insurance limit required banks to pay insurance premiums on more deposits and that some of these additional costs may have been passed on to the depositors in the form of rate cuts.

Next we utilize detailed household panel survey data from 2003 to 2006 for Canadian households, i.e. spanning the 2005 increase in the deposit limit. The data contain detailed information about insured and uninsured deposits at the account level at individual banks, which we need in order to make sure we can correctly delineate insured from uninsured deposits.[1] We then identify households that are affected by the change in the deposit insur-

[1]Just knowing the total amount of deposits for a household would not be informative, since households may spread deposits among different banks. As long as each account (or bundle of accounts) at each bank stays below the limit, they would still be fully insured. For more discussion see below.

ance limit. We focus on households with large uninsured deposit balances (households that are most affected by the policy change), and compare their portfolio allocation behavior to similarly wealthy households, with fully-insured deposit balances (unaffected households).

Using a difference-in-differences approach, we show that in the year following the limit increase, affected households rebalanced their portfolios away from bank deposits. Our specifications suggest that the affected group reduced its holdings of insured deposits by about 11% and reallocated these funds to risky assets, mainly to non-money market mutual funds. This corresponds to a 26% increase in the dollar amount of mutual funds being held by these households. We also observe that these households neither increase money-market funds holdings, nor do they buy more passive-managed index funds. Our back-of-the-envelope estimate suggests that overall, $16.1 billion (or 2.7% of all outstanding personal Canadian deposits in 2004) were moved to risky assets during the year following the limit change.

The findings are consistent with standard asset pricing theory suggesting that households aim to hold fixed shares of safe and risky assets. As households age and approach retirement they slowly adjust their portfolios towards a greater share of safe assets. As shown by Merton (1971), riskless human capital is abundant early on but diminishes overtime and this creates strong incentives to shift portfolio weights away from the risky asset. The empirical evidence to date is broadly consistent with this notion, documenting that the life-cycle portfolio adjustments occurs at both the extensive and intensive margins (Fagereng et al. (2017)). The evidence presented in this paper shows that changes in deposit insurance coverage, which exogenously increase the share of safe assets in household portfolios lead to offsetting portfolio adjustments to restore the balance between safe and risky assets. Ultimately, increases in deposit insurance limits may result in portfolios that involve more risk-taking as households seem to overcompensate.

2 Analytical Framework

2.1 Insurance Coverage Rules

The Canadian Federal budget of 2005 included an increase to the deposit insurance limit from \$60,000 to \$100,000 that went into effect on February that year. The reason for the increase was to ensure the continued relevance of the deposit insurance system, enhance protection for consumers, promote competition among deposit-taking institutions, and help Canadians save for retirement. Around that time, and especially towards the end of 2004, consumer advocacy groups were also vocal on the need to raise the limit to protect the value of deposits inflationary adjustments eroded the value of the protection, lack of competition due to industry consolidation, and limited awareness towards deposit insurance. The change affected all members of the Canada Deposit Insurance Corporation (CDIC), 81 institutions at that time, which include domestic banks and subsidiaries, domestic trust and loan companies, and subsidiaries of foreign financial institutions.

CDIC insures eligible deposits at each member institution up to the limit (principal and interest combined) on a per depositor basis (or, in the case of joint deposits, per set of joint owners), for each of the following: savings held in one name, joint deposits (savings held in more than one name), savings held in trust for another person, savings held in Registered Retirement Savings Plans (RRSPs), savings held in Registered Retirement Income Funds (RRIFs), savings held in Tax-Free Savings Accounts (TFSAs), and money held for paying realty taxes on mortgaged property. An eligible deposit must be held at a branch or office of a CDIC member institution in Canada, and be payable in a Canadian currency. Eligible deposits include savings accounts, chequing accounts, guaranteed investment certificates (GICs, which are somewhat similar to US Certificates of Deposit) or other term deposits with an original maturity of 5 years or less, money orders, certified cheques, and bank drafts issued by CDIC members, and debentures issued by loan companies that are CDIC members.

The deposit insurance limit applies to each member institution. Deposits held in the same person's name at multiple branches of the same institution are combined together. Finally, some CDIC member institutions have subsidiaries that are CDIC members in their own right. These subsidiaries have their own separate deposit insurance coverage.

2.2 Hypothesis Development

The analysis of optimal portfolio decisions of households can be traced back to Merton (1969) and Samuelson (1969). These studies have shown that if the household has a constant relative risk aversion utility function, markets are complete and labor income is ignored, then the optimal share of risky assets in financial wealth should be constant throughout the life-cycle. Using the notation in Cocco et al. (2005), this share can be denoted as:

$$\alpha = \frac{\mu}{\gamma \sigma_{\nu}^{2}},$$

where μ is the excess return of risky assets compared to safe assets ($R_{Risky} - R_{Safe}$), σ_{ν}^{2} is the standard deviation (i.e. risk) associated with the risky asset and γ is the household's risk aversion. Merton (1971) shows that this holds even without ignoring labor income, as long as labor income is constant and riskless. The implication is that absent any changes in μ, σ_{ν}^{2} and γ, the household should maintain a constant α.

The recent literature on household financial portfolio rebalancing has mostly concentrated on extending this idea by looking at variations in labor income and/or return on risky assets in order to see why investors do not maintain a constant α. For example, given that labor income is not constant and riskless, the life-cycle pattern of human capital should determine the asset allocation of investors' portfolios. Specifically, early on when human capital is abundant, there should be strong incentives to hold risky assets, but as investors get older and human capital diminishes, they should rebalance towards safer assets. This leads to a non-constant α over time. Studies such as Cocco et al. (2005), Guiso et al. (2002) and Fagereng et al. (2017) have looked at how households rebalance their portfolio composition as they age and enter retirement. Meanwhile, another strain in the literature (such as Brunnermeier and Nagel (2008) and Calvet et al. (2009))has looked at portfolio rebalancing after shocks to risky asset returns (changes in stock prices). Finally, studies such as Chetty et al. (2016) have looked at the impact of housing on households' portfolio choices.

This study looks at household portfolio rebalancing from a different point of view. Specifically, we examine household portfolio rebalancing following a policy change that converts some assets from risky to safe. In the absence of any substantial changes to μ, σ_ν^2 and γ, this should result in the portfolio weight of risky assets falling below the optimal α, requiring a rebalancing of the portfolio. It is likely that households respond by shifting funds out of the asset that becomes safe towards the remaining risky assets, in order to restore the portfolio share back to α.[2] Furthermore, as our study spans a relatively short period of time (four years), life-cycle considerations related to labor income and portfolio composition are less of a concern. This allows us to look at how an optimal portfolio decision made for a certain point in a household's life-cycle is affected by a conversion of a risky asset into a safe one, making it easier to appeal to the seminal finding of Merton (1969) and Samuelson (1969).

Generally speaking, the literature considers risky-assets to be directly held stocks, non-money market mutual funds and corporate bonds, whereas safe assets are broadly defined as bank deposits, money market mutual funds and government bonds. Identifying whether deposit insurance affects portfolio decision requires a finer definition of bank deposits, specifically, insured vs. uninsured deposits.

Depositors with sufficiently high level of deposits (referred to as "high-value depositors") can alter the risk and return of their deposits by allocating them in different ways. Having

[2]In the robustness section, we consider and rule out alternate explanations related to a change in α itself, which may be due to a change in the financial advice received by the household (a change in γ) or changes in risk appetite due to housing-related factors (again, a change in γ).

deposit accounts with balances above the deposit insurance limit ("partially insured" accounts) involves a degree of risk. In case of bank failure, the depositor will be guaranteed to get the maximum insured amount, but the rest may be lost. Accordingly, the deposits in a partially-insured account get split into two for portfolio purposes; the amount of funds up to the limit are safe assets, while the rest (*balance* - *limit*) are risky. Nevertheless, the very low probability of a bank failure in Canada makes these uninsured deposits a less risky investment relative to stocks, corporate bonds and non-money market mutual funds.

High-value depositors can also split their funds across multiple accounts that are insured separately (by opening accounts in different institutions or by taking advantage of the per-depositor nature of deposit insurance). In this scenario, all bank deposits will be safe; presumably, this full insurance coverage is what makes this approach attractive to some depositors. As discussed below, these small value accounts do not offer advantageous deposit rates and there might be various (and unobserved) transaction costs associated with maintaining multiple bank accounts. Our household-level data suggests that both strategies (full vs. partial insurance coverage) are commonly used by high-value Canadian depositors and Shy et al. (2014) provide evidence of both types of depositor behavior in the US.

Why would a depositor choose a partially insured deposit account over the safety of splitting funds across a few fully insured accounts? The likely answer is the relatively higher rates financial institutions offer on high balance deposit accounts (also known as "jumbo" accounts). As discussed in detail below, the rates on these high balance, partially-insured accounts are not easy to interpret, since there are no separate interest rates on the insured vs. uninsured portions of the account. Instead, there is a single deposit rate for each partially-insured account, which can be thought of as a weighted average of $R_{SafeDeposit}$ and $R_{RiskyDeposit}$ (with $R_{RiskyDeposit}$ being unobserved). Even this weighted average, however, should be greater than the return on an account consisting entirely of insured deposits.

Given this framework, we assume that wealthy households choose a portfolio comprising of safe assets (insured bank deposits, government bonds and money market mutual funds) and risky assets (uninsured bank deposits, corporate bonds and non-money market mutual funds). The increase in the deposit insurance limit converts some bank deposits from uninsured to insured, altering the portfolio share of risky assets below the optimal α. This change requires the household to rebalance its portfolio by using insured bank deposits to buy risky assets. Therefore, our main hypothesis is that a higher deposit insurance limit is associated with households holding fewer bank deposits and more risky assets, such as non-money market mutual funds, corporate bonds and stocks.

2.3 Identification: Difference-in-Differences

We analyze the effect of the 2005 deposit insurance limit increase on the household portfolio allocation decision in a difference-in-differences (DinD) setting. This allows us to control for any trends or life-cycle patterns that might affect the allocation across asset types over time. We define the group that is most "affected" by the limit increase as the depositors who had at least one partially-insured account, i.e. with a balance greater than \$60,000, during the pre-change period. For them, any amount above the pre-change limit of \$60,000 but below the new limit of \$100,000 becomes fully insured.

The "unaffected" group includes depositors without any partially-insured accounts during the pre-change period, despite having a total deposit balance above the pre-change limit of \$60,000. These depositors *could* have been partially-insured, if they had concentrated all (or most) of their deposits in a single account. Instead, they achieved full coverage by spreading deposit balances across multiple accounts or institutions. We assert that the limit increase did not alter the portfolio composition of these households. Since none of their accounts were partially-insured to start with, the higher limit should not affect their return on safe assets and the share of risky assets in their portfolios should remain unchanged.

We limit the unaffected group to households that had the potential to be partially-insured if they chose to do so. In contrast, households without \$60,000 in *total* financial wealth in the pre-change period (even if they held all of their wealth in a single deposit account, this account would have been fully insured) are likely to have much different characteristics compared to the affected group. Similarly, wealthy households with more than \$60,000 in total financial wealth, but with than \$60,000 in deposits can differ from the affected households, especially regarding risk appetite (γ in the discussion above).

After establishing the groups of affected and unaffected households, we compare the portfolio allocations of the two groups the periods before vs. after the limit change. We do this by estimating the following depositor-level OLS regression:

$$Y_{i,t} = \alpha_1 + \alpha_2 Affected_i \cdot Post_t + \alpha_3 Post_t + \alpha_4 Affected_i + \alpha_5 X_{i,t} + \epsilon_{i,t}, \tag{1}$$

where $Y_{i,t}$ is the outcome variable measured in year t for depositor i, $Affected$ is a dummy variable that equals one for affected depositors, $X_{i,t}$ is a vector of time-varying depositor characteristics. It includes gross income, total wealth, age (and age squared), a marital status dummy, home ownership dummy, household size, education level dummies (high school, some college and college), a dummy variable for whether the household lives in a large metropolitan area and dummy variables for each of the ten Canadian provinces. We cluster the standard errors at the level of the depositor's local area, captured by the first two digits of the depositor's postal code. The coefficient of interest is α_2, which captures the change in $Y_{i,t}$ following the increase in the deposit insurance limit.

While estimating Equation 1 via OLS, we also recognize that our dependent variables are bounded between zero and one (given that they are portfolio weights). This suggests that the effect of any independent variable cannot be the constant throughout the bounded range of $Y_{i,t}$; otherwise, the model can generate predictions below zero or above one for our "fractional" variable $Y_{i,t}$. In order to account for this possibility, we also estimate a "fractional logit" model, as developed by Papke and Wooldridge (1996). Specifically, we estimate the following general linear model (GLM):

$$E(Y_{i,t}|\mathbf{x}) = G(\alpha_1 + \alpha_2 Affected_i \cdot Post_t + \alpha_3 Post_t + \alpha_4 Affected_i + \alpha_5 X_{i,t}), \tag{2}$$

where $\mathbf{x}$ represents the vector of all our covariates and G(.) is a logistic link function.[3]

Another concern is that the affected and unaffected groups could differ along some dimensions that are correlated with the portfolio allocation decision, which would then bias the estimation. We address this concern by having another empirical specification where depositor characteristics are fixed as of the pre-change period, and they are interacted with $Post_t$. This specification, as discussed in Barrot (2016), ensures that the results are not driven by the pre-period differences between affected and unaffected households. It also alleviates the concern that the estimation is biased due to the heterogenous distribution of depositor characteristics such as age, wealth, and education. The equation for this specification:

$$Y_{i,t} = \alpha_1 + \alpha_2 Affected_i \cdot Post_t + \alpha_3 Post + \alpha_4 Post \cdot X_i + \delta_i + \epsilon_{i,t}, \tag{3}$$

where most variables are as defined above, except X_i is now the vector of depositor characteristics measured at the pre-change period and δ_i is a household-level fixed effect. Note that X_i no longer enters separately in this specification, as it is absorbed by δ_i.

[3]However, the use of a fractional logit model in a DinD setting also raises its own issues related to the complexity of using and interpreting interaction terms in nonlinear models (Ai and Norton (2003)). Accordingly, we opt to use the OLS estimation of Equation 1 and the fractional logit model in Equation 2 together as complements. As discussed below, the two models yield very similar results.

3 Data

3.1 Household survey

Our starting point is the Canadian Financial Monitor (CFM) survey conducted annually by the marketing firm Ipsos-Reid. The CFM includes an annual sample of approximately 12,000 households and although it is a repeated cross-sectional survey, some households complete it more than once, usually in consecutive years.

Our variables of interest come from the CFM section that covers households' banking habits, in particular their checking, savings, and term deposit holdings (in the form of GICs). The data includes the type of account, amount held, and the institution's identity. The availability of such detail allows us to analyze and categorize deposits at the account level. For example, using information on the maturity of GICs, we can determine accounts that are not eligible for deposit insurance due to their long maturity. Similarly, we are able to identify US Dollar-denominated checking and savings accounts, which are not eligible for deposit insurance coverage. The survey also contains sections on households' holdings of stocks, bonds and mutual funds, and detailed demographic information, such as household composition, age, income, occupation and employment status. Based on the above information we define a household's total financial assets as:

$$\begin{aligned} \textit{Financial Assets} &= \textit{insurance-eligible deposits} + \textit{safe financial assets} \\ &+ \textit{risky assets}. \end{aligned}$$

Safe financial assets include government bonds and money market mutual funds, while risky assets are stocks, non-government bonds and mutual funds. We start by splitting our sample into two periods: pre-change covers the years 2003 and 2004, while the post-change period is 2006. We then build a panel sample by identifying households that show up at least once in both the pre-change and post-change periods. For households that show up more than once in the pre-change period (i.e. the household completed the survey in both 2003 and 2004), we drop the 2003 observation. Given our identification strategy, we limit the sample to those households with *pre-change* financial assets and deposit balances that are greater than $60,000.

Correctly classifying fully- vs. partially-insured households within that sample requires us to identify and analyze each deposit insurance-eligible account for each household. This involves several steps, given the Canadian deposit insurance rules and regulations. For example, the rules allow two savings accounts of the same household in the same institution to be separately insured up to the limit if one account is solely owned by one spouse, while the other is jointly owned. Therefore, we take into consideration whether the account is held by the "male head of household", "female head of household", "other member of household" or "held jointly", in identifying the number of "insurance eligible" accounts each household holds in any given institution. If the household, on the other hand, has two accounts with the same owner, then we combine these two accounts into one.[4]

As a further detail in this process, it is possible for a subsidiary of a Canadian bank to be a CDIC-member on its own. Therefore, a household can open accounts in both the parent institution and the CDIC-member subsidiary, and each account will be individually insured up to the deposit insurance limit. In calculating the number of "insurance eligible bundles", we also account for CDIC-member subsidiaries. This process allows us to compare the balances in each "insurance eligible bundle" to the applicable limit (based on the insurance scheme covering the bundle) and to determine if the balance of the bundle exceeds the limit. For expositional ease, we refer to these "insurance eligible bundles" as "accounts" from this

[4]As a concrete example, if household i has one joint checking account, one joint savings account, one savings account owned by the male head of household and two GICs owned by the female head of household in bank b, we consider this household to hold three "uniquely insurable accounts" (after combining the joint checking and savings accounts together, and counting two GICs of the female head of household as a single account).

point on.

Our final sample includes 883 panelists for each period, 491 of them are partially insured and represent the affected group, whereas 392 are fully insured and as such serve as the unaffected group. Table 1 compares the groups and establishes a number of stylized facts. During the pre-period, the groups are relatively similar in terms of their portfolio shares held in insurable deposits (66% vs. 69%) and safe assets (4% vs. 5%). While the risky share for the affected households is significantly lower compared to that of the unaffected group (22% vs. 26%), the affected HHs are also slightly older (by about 3 years), providing some evidence in favor of the life-cycle patterns discussed previously. Furthermore, the significant difference in the risky share might also be attributed to the difference in the ratio of home equity to financial wealth between the two groups. Chetty et al. (2016) show that housing has a substantial impact on portfolio choice, as households with higher home equity wealth hold more stocks. As discussed above, we follow Barrot (2016) and ensure that the results are not driven by these pre-event differences via a regression specification that interacts the pre-event characteristics with a post dummy. Finally, we conduct parallel-trends tests analysis on the portfolio shares of insurable deposits, risky, and safe assets, to confirm that any differences in the levels (if significant) remain the same in the years leading to the event.

[INSERT TABLE 1 HERE]

3.2 Rates of Return on Deposits

Our second data set provides detailed monthly information concerning deposit rates offered on Guaranteed Investment Certificate (GIC) accounts, which are time-deposit accounts similar to US Certificates of Deposits (CDs).[5] This allows us to measure the spread between partially- and fully-insured GICs accounts and observe what happened to this spread following the increase in the deposit insurance limit. Canadian financial institutions frequently offer different GIC accounts with minimum and maximum balance requirements. Specifically, any GIC with a *maximum* balance requirement below $60,000 during the pre-change period will be fully insured. On the other hand, a GIC with a *minimum* balance requirement above $60,000 implies that a portion of these deposits will not be insured. Therefore, it is likely that there will be a spread between the rates on partially and fully-insured GICs.

In addition to the riskiness of uninsured deposits, deposit insurance premiums might also play a role in the rates on partially-insured accounts. By choosing to deposit a large amount of funds in a single account and not distributing it across multiple smaller accounts within the bank (for example, by taking advantage of joint accounts being insured separately than those owned by single family member), the depositor is saving the bank deposit insurance premium payments.[6] Therefore, banks may pass on some of these cost savings to the high value depositors who open partially-insured accounts.

We calculate this spread by identifying financial institutions that offer two otherwise identical accounts where one account is partially-insured while the other is fully-insured. When finding these account pairs, we control for a number of account features: taxability, redeemability, compounding frequency and timing of interest payments. By taking the difference between two otherwise identical accounts offered by the same financial institution in the same month, we are able to precisely measure the difference in rates that is solely due to the variation in minimum and maximum balance requirements. This is the spread offered to depositors willing to take on some risk by maintaining an account balance above the in-

[5] The GIC interest rate data is obtained from CANNEX, a privately held Canadian company that provides data and information services to the financial services industries in Canada and the United States.

[6] As an example, consider a household with $120,000 in deposits. Before the increase in the federal insurance limit, the required premiums for two $60,000 accounts would have been $25.20, while the bank would have only paid $12.60 if the depositor chose to deposit the entire $120,000 in a single account.

surance limit. Since many financial institutions offer more than one such pair of accounts, we often observe multiple spreads for a given financial institution in a given month.

Using this approach, we are able to calculate the monthly spread offered by 13 Canadian financial institutions (after collapsing multiple small financial institutions into larger categories, in order to mimic the manner financial institutions are categorized and named in our household survey). Not every Canadian financial institution is included in our sample; some institutions offer accounts that cannot be easily categorized as fully- or partially-insured.[7] Nevertheless, we are able to calculate monthly spreads for all of the six largest banks in Canada (which account for more than 75% of all Canadian bank deposits). We observe that during the period leading up to the deposit insurance limit (2003-2004), the average spread across all financial institutions was 12.5 basis points but the average spread fell to 7.48 basis points during the post-change period (2005-2006).

4 Results

4.1 Interest Rates and Balances of Uninsured Deposit Accounts

We begin by providing evidence on how the change in the deposit insurance limit affected the return on uninsured deposits. As discussed above, our data on Canadian GIC rates allow us to calculate the "spread" offered by banks on partially- vs. fully-insured deposit accounts, while holding all bank and account characteristics constant. We then estimate the following regression to analyze the change in the spread between partially- and fully-insured account

[7] For example, many financial institutions offer GICs with a low minimum balance requirement and no maximum balance limit. In such cases it is not immediately obvious whether this account is fully- or partially-insured. This may depend on the type of clients towards whom the financial institution markets the account. We leave such observations out of our calculations, leading to some financial institutions being dropped from our sample.

rates following the change in the deposit insurance limit:

$$Spread_{ijt} = \alpha \cdot Post_t + \beta_i + \gamma_j + \epsilon_{ijt}, \tag{4}$$

where $Post_t$ is a dummy variable capturing the period after the increase in the deposit insurance limit was officially announced. Since the announcement was made in early February, we consider January 2005 and onwards to be the post-change period. This allows us to account for the possibility of Canadian institutions anticipating the change even a bit before it was announced (discussed in more detail below). β_i and γ_j represent bank and account type fixed effects, respectively.[8] Our monthly sample period is between January 2003 and December 2006. The results of this estimation are given in Table 2, with the standard errors clustered by account type.

The results in Column (i) of Table 2 suggest that there was a significant decrease in the spread between partially- and fully-insured deposit accounts (approximately 5 basis points). This fall in the spread confirms our assertion that the higher limit makes partially-insured accounts safer, without requiring a decrease in return on a dollar of uninsured deposits ($R_{RiskyDeposit}$).[9]

[INSERT TABLE 2 HERE]

Next, we extend this empirical analysis in order to ensure that there was no existing

[8]Recall from above that we create unique account types based on the different characteristics of deposit accounts offered by each bank. Therefore, we can frequently observe multiple spreads for a given bank in a given month.

[9]Since there will always be an insured deposit component of the balance, the deposit rate on the partially-insured account will always be below R_{Risky}. The following example illustrates this point. Consider an account with a minimum balance requirement of 60,000 CAD and a maximum balance requirement of 200,000 CAD. Suppose that $R_{RiskyDeposit} = 3.5\%$, while $R_{SafeDeposit} = 3\%$. Since this account will have 60,000 CAD in insured deposits and at most 140,000 CAD in uninsured deposits, a likely deposit rate is (60,000/200,000)* 3% + (140,000/200,000) * 3.5% = 3.35%. If the limit becomes 100,000 CAD, the new rate will be (100,000/200,000)* 3% + (100,000/200,000) * 3.5% = 3.25%

downward trend in the spread prior to the increase in the deposit insurance limit. We also would like to determine whether the decrease in the spread was a permanent phenomenon (which would be in line with our hypothesis). We perform this test in two ways. First, we run a placebo regression similar to the one discussed above, where the placebo pre-change period is defined as January 2003-December 2003, while the placebo post-change period is defined as January 2004-December 2004. Results of this placebo regression are given in Column (ii) of Table 2 and they suggest that there was no downward trend in the spread prior to the change in the deposit insurance limit.

In order to further confirm the validity of parallel trends and also to show that the impact of the deposit insurance limit change on the spread was permanent, we also estimate the following equation:

$$Spread_{ijt} = \alpha_1 \cdot Q_1 + \alpha_2 \cdot Q_2 + ... + \alpha_{16} \cdot Q_{16} + \beta_i + \gamma_j + \epsilon_{ijt}, \tag{5}$$

where Q_t is a quarter dummy for each quarter in our sample period (2003q1, 2003q2, etc.). These quarter-specific αs, along with a 95% confidence interval are presented in Figure 1. The figure reveals a sharp and sustained drop in the spread, starting in late-2004 (one quarter prior to the announcement). Late-2004 also corresponds to the start of a media campaign arguing that the $60,000 limit had become outdated and calling on the CDIC to increase the deposit insurance limit.[10] It is likely that at least some Canadian banks were confident enough in a higher deposit insurance limit to adjust their spreads in late-2004.

[INSERT FIGURE 1 HERE]

[10] For an example, please see "It's about time the CDIC raised its paltry coverage on bank deposits", *Globe and Mail*, October 28, 2004. Available at `http://www.theglobeandmail.com/globe-investor/investment-ideas/its-about-time-the-cdic-raised-its-paltry-coverage-on-bank-deposits/article746680/`, accessed February 2017.

After establishing the impact of the change in the deposit insurance limit on the interest rates offered on large value, partially-insured accounts, we proceed to showing evidence in favor of depositor withdrawals from these accounts. For this analysis, we use our CFM-based household sample to create an account-level sample. Specifically, we identify individual deposit accounts (for both our affected and unaffected households) that we can track between our pre-change and post-change periods. This is not a trivial task; since individual deposit accounts of households do not have unique identifiers, we need to match accounts reported by a household in two different time periods across a number of characteristics (institution, the owner of the account, whether the account is a retirement account, etc.). We are unable to find both pre- and post-change observations for all accounts; sometimes information is different or missing for one of the account characteristics and sometimes accounts that appear in the pre-change period are absent in the post-change period (perhaps because the account was closed). Nevertheless, we are able to identify 2,312 accounts, of which 426 had balances higher than the deposit insurance limit during the pre-change period.[11]

Once we form the sample of "affected" (pre-change balance exceeds the deposit insurance limit) vs. "unaffected" deposit accounts, we estimate the following simple difference-in-differences regression:

$$Balance_{i_b jt} = \beta_1 \cdot Affected_{i_b} \cdot Post_t + \beta_2 \cdot Post_t + \beta_3 \cdot Affected_{i_b} + \gamma_j + \rho_b + \epsilon_{i_b jt}, \quad (6)$$

where $Balance_{i_b jt}$ is the balance of deposit account i being held at financial institution b and belonging to household j during time period t. γ_j and ρ_b are household and financial

[11]We are able to identify at least one such large value account for 345 out of 491 "affected households" in our sample. Another 189 accounts with balances exceeding the deposit insurance limit in the pre-change period do not appear in the post-change period. Including these accounts in our analysis as balances going down to zero (i.e. assuming that the account was closed) may bias us in favor of a withdrawal effect. As such, we opt for the conservative approach of not including these accounts in the analysis. If we are to include these accounts in the analysis, we would have at least one large value account for 423 out of 491 "affected households" in our sample.

institution-level fixed effects. The results of the estimation of Equation 5 is given in Table 3. The coefficient of $Affected_{i_b} \cdot Post_t$ suggests that the high value deposit accounts were subject to large and significant withdrawals, once the deposit insurance limit increased. This finding is in line with a reduction in the spreads offered on these accounts leading to depositors withdrawing some of their funds in search of better yields.

[INSERT TABLE 3 HERE]

Finally, we extend our analysis to look for heterogeneity in spread changes and subsequent withdrawals among different Canadian financial institutions. One motivation for this extension is the size of the decrease in the spread between partially- and fully-insured deposit accounts. Both Table 2 and Figure 1 suggest that the change in the deposit insurance limit led to a relatively modest 5 basis point decrease in the spread. However, as discussed below, this average effect masks considerable heterogeneity across financial institutions. We investigate such heterogeneity by estimating Equation 5 with $Post_t$ interacted with financial institution dummies. We also re-estimate Equation 6 where $Affected_{i_b} \cdot Post_t$ is interacted with individual financial institution dummies. The results of these estimations are presented in Table 4.

[INSERT TABLE 4 HERE]

The results show a range of -17 to +2.9 basis points for changes in the spread. Furthermore, the amount of withdrawals from affected accounts (i.e. those with a pre-change balance above the deposit insurance limit) seem to be correlated with the decline in the spreads. The five financial institutions with the largest decreases in spreads also experienced relatively large withdrawals.[12] The correlation between changes in the spread and account

[12]The few exceptions to this pattern may be partially driven by the small size of our affected account

withdrawals is especially true for the five financial institutions with the highest number of affected accounts in our sample. Among these five financial institutions (which represent five of the "Big Six" Canadian banks), the decline in the affected account balances is larger for the three that also had a bigger reduction in their spreads.

4.2 Portfolio Analysis

We begin by reporting the overall effect of the limit change on the portfolio allocations, following the regression specification of equation 1. For brevity, we do not report the full set of household controls, which are listed in Table 1. The results in Table 5 indicate that on average, affected households reduce their insurable deposit account balances by about 7.6%, they increase the portfolio share invested in risky assets by about 5.7%, while they keep constant the share held in safe assets. The effect is somewhat bigger, with an 11% drop in insurable deposits and an increase of about 8% in the risky asset share, when we interact the pre-2005 household characteristics with the post dummy (following Equation 2), and similar in size if we estimate the relation using the fractional logit method.

[INSERT TABLE 5 HERE]

Since the evidence suggests clear rebalancing towards risky assets, we extend the analysis by decomposing the risky portfolio holding into its subcomponents, i.s. stocks, non-government bonds, and non-money market mutual funds (non-MMMF). The results from column (i) in Table 6 indicate that the portfolio share invested in stocks goes up by about 2.6%, whereas the share of non-MMMF rises by 3.2% (or twice as large under column (ii)

---

sample. For example, FI-8 has the largest decrease in the spread and the largest amount of withdrawals, but the change in the account balance is insignificant. Nevertheless, the p-value of this coefficient is 0.14 and the lack of precision may be partially due to the fact that we can only identify nine affected accounts for this financial institution. Similarly, the relatively few accounts we observe for FI-4 may contribute to the presence of a large, negative and significant change in affected account balances, despite the absence of a significant effect on the spread.

when we fix the household characteristics at the pre-2005 levels.

[INSERT TABLE 6 HERE]

The data allows for a further decomposition of the non-MMMF share based on the riskiness of the fund. Segregated funds, for instance, offer protection against a certain level of decline in the value of the fund upon maturity (usually either 75% or 100% of the invested amount is protected) and also offer estate planning benefits (Khorana et al. (2009)). Although segregated funds are more costly and therefore have lower returns compared to other mutual funds, their offered protection makes them a potential substitute for partially insured deposit accounts. Index funds, which are less actively managed and carry relatively low management fees, are another investment option for affected households to switch away from bank deposits. In an unreported set of regressions, we observe that the portfolio share of these two types of funds remains the same in the post period, indicating that households indeed, rebalance into riskier types of mutual funds.

These empirical results provide strong evidence of changes in deposit insurance limits having an impact on the allocation of household financial asset portfolios. In our case, with a higher limit, some households substituted away from these high balance deposit accounts towards riskier assets, namely stocks and non-money market mutual funds, in search of yield. A back-of-the-envelope calculation suggests that a 7.6% decrease in the portfolio weight of bank deposits (the smallest significant coefficient of interest from Table 6) implies an 11% reduction in total bank deposits held by affected households. Given that the average affected household had approximately $249,000 in bank deposits during the pre-change period, this translates into $27,390 being shifted into risky assets. Given that the average age of affected head of household household is 66 during the pre-change period, this shift away from a safe asset such as bank deposits and towards risky assets goes against many of the life cycle-driven predictions in the household finance literature. When considered from a life-cycle perspective, the switch away from deposits towards risky assets could have increased the riskiness of many households' retirement savings.

Nevertheless, it should be noted here that the share of affected households in the general Canadian population is relatively low, implying that the aggregate impact of this portfolio rebalancing effect is likely to be limited. Using the entire CFM sample for 2004 (as opposed to our panel sample) and utilizing the survey weights, we estimate that there were 590,033 affected Canadian households in 2004. Using dollar estimate of the average amount of deposits converted to risky assets ($27,390), this implies a total of $16.1 billion leaving the bank deposit space. This corresponds to 2.7% of all personal deposits outstanding in the Canadian financial system at the end of 2004. Meanwhile, the coefficients in Table 6 can be interpreted as slightly more than 50% of reduction in the deposit balances of affected households being due to investments in non-money market mutual funds. If we assume that 55% of the $16.1 billion from above was invested in non-MMMF, this corresponds to a 1.9% increase in the net assets of these funds between 2004 and 2006. While the impact of the change in the federal deposit insurance limit was sizeable for some households, the aggregate movement in funds represent a small portion of the depository intermediation and mutual fund industries.

5 Robustness and Extensions

5.1 Parallel Trends Test

Our empirical specification is based on the assumption that the portfolio allocations of affected and unaffected households followed parallel trends prior to the increase in the deposit insurance limit. In order to validate this assumption and rule out the existence of pre-change trends that may have already been driving down the portfolio share of bank deposits among affected households, we estimate placebo regressions. Specifically, we re-estimate Equations 1, 2 and 3 where the placebo pre-change period is 2000-2002 and the placebo post-change period is 2003-2004. Affected vs. unaffected categorization of the households is still defined as of 2003-2004.

Given that our main data source is a repeated cross-section and not a panel, it is not possible to observe all of the households in our main sample during the 2000-2002 period. In total, 445 households (out of 883) have also completed the CFM survey in 2000, 2001 or 2002. Out of these 445 households, 238 are affected and 207 are unaffected (compared to 491 and 391 in the baseline sample).

The results of the placebo tests are given in Table 7. These rule out the presence of any pre-existing trends in the portfolio weights of bank deposits, risky or safe assets during the pre-change period. This validates the parallel trends assumption and our choice of the difference-in-differences framework.

[INSERT TABLE 7 HERE]

5.2 Housing and the Financial Portfolio

As discussed in Chetty et al. (2016), housing can play an important role on the portfolio allocation of households. Specifically, Chetty et al. (2016) find that higher home equity can lead to a lower risk aversion (a smaller γ) and to a higher share of risky assets in the household's portfolio (a higher α). Meanwhile, for a given level of home equity, an increase in the home value translates into higher mortgage debt, which is associated with higher risk aversion and a lower share or risky assets. Therefore, if the affected households in our portfolio had disproportionately faster increases in their home equity or if the unaffected households saw an increase in their mortgage debt, these can also explain the portfolio rebalancing effects we observe in our empirical analysis.

In order to make sure that our results are not being driven by the housing-related factors, we slightly revise and re-estimate our baseline specification:

$$\begin{aligned} Y_{i,t} &= \alpha_1 + \alpha_2 Affected_i \cdot Post_t + \alpha_3 Post_t + \alpha_4 Affected_i \\ &+ \alpha_5 HomeValue_{i,t} + \alpha_6 HomeEquity_{i,t} + \alpha_7 X_{i,t} + \epsilon_{i,t}. \end{aligned} \tag{7}$$

This setup is very similar to the basic OLS specification in Chetty et al. (2016), where $HomeValue_{i,t}$ and $HomeEquity_{i,t}$ are meant to capture the impact of home value and home equity on the portfolio share of different types of assets. As discussed in Chetty et al. (2016), the OLS estimates for α_5 and α_6 are likely to be biased due to correlation between the error term and the housing-related variables. However, we are primarily interested in whether α_2 is robust to the presence of these housing-related variables; estimating Equation 7 via OLS should be sufficient to satisfy this goal. Indeed, the results in Table 8 suggest that the inclusion of the two housing variables do not change our main empirical findings. The share of bank deposits in the affected households' portfolios decline, while the share of risky assets increase. Meanwhile, the signs (but not the significance) of the coefficients for $HomeValue_{i,t}$ and $HomeEquity_{i,t}$ are broadly in line with the findings in Chetty et al. (2016) (higher home values are associated with more safe and less risky assets, while higher home equity is associated with fewer safe and more risky assets in the portfolio).

[INSERT TABLE 8 HERE]

5.3 Other Contemporaneous Policy Changes

To ensure that the deposit insurance limit change causes households to rebalance their portfolios towards risky assets, and in particular increase the share invested in mutual funds, we examine whether a different policy change that was adopted at the same time might have been the driving force behind that change. The policy we have in mind is the introduction of an investor protection plan by the mutual fund dealer association of Canada (the MFDA) in mid-2005, which entails a coverage of up to $1 million to investors in the event that their mutual fund dealer becomes insolvent.

In part the difference-in-differences approach taken above addresses the concern that our empirical results are driven by this change. If indeed the higher attractiveness of mutual funds due to the policy change was at the root of the portfolio rebalancing, there is no reason to believe that only households with uninsured deposits would rebalance their portfolio, but rather all households. We do not observe such an outcome. Further, while such a protection might in theory increase flows to the mutual fund sector, the protection's features make this outcome unlikely. Specifically, the MFDA makes it clear that coverage is only valid for financial losses that arise from the failure of a dealer to return or account for customer's property (securities, cash, segregated funds) held by or in the control of the insolvent member-institution, including the conversion of such property. Losses which do not result from insolvency, such as losses from changing market values of securities, unsuitable investments or the default of an issuer of securities are not covered. As such, financial losses are determined on the date of insolvency or bankruptcy of the member institution, which means that most likely the value of the customer's mutual funds at that point is lower than what it was when they were bought initially. Thus unlike deposit insurance that guarantees principal and interest repayment, the MFDA protection still leaves investors exposed to losses.

Nevertheless, to further alleviate the concern that the introduction of the mutual protection drives the results, we repeat the analysis on a sub-group of households that already held mutual funds in the pre-2005 period, since they are already familiar with mutual funds and for them the introduction of the protection fund is less likely to play a role. Table 9 below confirms the same baseline pattern: depositors who were already mutual fund holders still react by reducing their safe asset holdings and shifting into risky assets.

[INSERT TABLE 9 HERE]

5.4 The Role of Financial Advice

One potential explanation for the portfolio rebalancing effect is financial advice. Specifically, it is possible that affected households were not receiving financial advice during the pre-change period and they had placed a disproportionately high weight on partially-insured deposits as a result. The increase in the deposit insurance limit and the subsequent decrease in the spread may have prompted these households to seek financial advice and the advice they received may have contributed to the rebalancing of their portfolios. In other words, the increase in the portfolio weight of risky assets represents both a compensation for the lower spread on partially-insured deposits and a correction of earlier mistakes that led to partially-insured deposits being very prominent in the portfolio in the first place.

We are able to investigate this possibility using survey questions on a household's use of financial advice. Specifically, the CFM survey includes the question "Over the last 12 months, did anyone in your household receive any professional advice (free or for a fee) from any of the following?", with the household indicating the number of times it received advice from different types of financial firms.[13] Using this question, we calculate the total number of times a household received professional advice and the number of times it received advice from deposit-taking institutions during the previous 12 months. The data suggest that both affected an unaffected households received professional advice twice during the pre-change period (2.02 times for affected and 2.15 times for unaffected households). During the post-change period, the frequency of professional advice decreased, but remained similar

[13]These different types of firms are "Banks/Trusts/Credit Unions", "Brokers", "Insurance Companies", "Independent Advisers" and "All Other". The household chooses between the options "Not Used". "1', "2', "3-4", "5-6" and "7+". We consider "3-4", "5-6" and "7+" to be 3, 5 and 7 visits, respectively.

for the two groups of households (1.82 for affected and 1.97 for unaffected). Therefore, upon first glance, it does not appear that the deposit insurance limit increase was associated with affected households receiving more professional advice.

Nevertheless, we use the "frequency of professional advice" as a dependent variable in equations 1 and 3 to check this possibility. Since the dependent variable is a count, we also consider a negative binomial specification during this estimation. As seen in Table 10, the frequency with which affected households received professional advice (from deposit-taking institutions or otherwise) did not change after deposit insurance limits increased. Therefore, it is quite unlikely that the policy change acted as a catalyst for these households to receive financial advice and subsequently change their portfolio allocations.

[INSERT TABLE 10 HERE]

6 Conclusion

In this paper we examine how households adjust their behavior following an exogenous change to the amount of safe assets in their portfolios. In 2005, the deposit insurance limit in Canada was raised from 60,000 CAD to 100,000 CAD. Such an increase effectively converts part of the previously uninsured deposits in the households' portfolios into safe fully-insured deposits.

Using detailed household-level survey data, along with information on the rates of return that banks offer on deposits, we document that in the year following the limit increase, banks consequently adjust rates on large deposits and that households respond by shifting parts of their portfolios towards riskier assets outside the banking system. This is consistent with households attempting to maintain a constant allocation between safe and risky assets, as suggested by standard asset pricing models.

Overall, we estimate that about 2.7 percent of all outstanding deposits in Canada were moved to risky assets outside the banking system following the limit change. Thus our results confirm that an increases in the deposit insurance limit may result in portfolios that involve more risk-taking, as households seem to overcompensate.

References

Ai, C. and E. C. Norton (2003). Interaction terms in logit and probit models. *Economics Letters 80*(1), 123–129.

Allen, F., E. Carletti, I. Goldstein, and A. Leonello (2015). Moral hazard and government guarantees in the banking industry. *Journal of Financial Regulation 1*(1), 1–21.

Badarinza, C., J. Y. Campbell, and T. Ramadorai (2016). International comparative household finance. *Annual Review of Economics 8*(1), 111–144.

Barrot, J.-N. (2016). Trade credit and industry dynamics: Evidence from trucking firms. *Journal of Finance 71*(5), 1975–2016.

Brunnermeier, M. K. and S. Nagel (2008). Do wealth fluctuations generate time-varying risk aversion? Micro-evidence on individuals' asset allocation. *American Economic Review 98*(3), 713–736.

Calvet, L. E., J. Y. Campbell, and P. Sodini (2009). Fight or flight? Portfolio rebalancing by individual investors. *Quarterly Journal of Economics 124*(1), 301–348.

Chetty, R., L. Sandor, and A. Szeidl (2016). The effect of housing on portfolio choice. *Journal of Finance*, forthcoming.

Cocco, J. F., F. J. Gomes, and P. J. Maenhout (2005). Consumption and portfolio choice over the life cycle. *Review of Financial Studies 18*(2), 491–533.

Fagereng, A., C. Gottlieb, and L. Guiso (2017). Asset market participation and portfolio choice over the life-cycle. *Journal of Finance*, forthcoming.

Guiso, L., M. Haliassos, and T. Jappelli (2002). *Household Portfolios.* MIT Press.

Guiso, L. and P. Sodini (2013). Household finance: An emerging field. *Handbook of the Economics of Finance 2B*(1), 1397–1531.

Iyer, R., T. Jensen, N. Johannesen, and A. Sheridan (2016). The run for safety: Financial fragility and deposit insurance. EPRU (University of Copenhagen) Working Paper Series No. 2016-2.

Khorana, A., H. Servaes, and P. Tufano (2009). Mutual fund fees around the world. *Review of Financial Studies 22*(3), 1279–1310.

Merton, R. (1969). Lifetime portfolio selection under uncertainty: The continuous time case. *Review of Economics and Statistics 51*(3), 247257.

Merton, R. (1971). Optimum consumption and portfolio rules in a continuous-time model. *Journal of Economic Theory 3*(4), 373–413.

Papke, L. E. and J. M. Wooldridge (1996). Econometric methods for fractional response variables with an application to 401(k) plan participation rates. *Journal of Applied Econometrics 11*(6), 619–632.

Samuelson, P. A. (1969). Lifetime portfolio selection by dynamic stochastic programming. *Review of Economics and Statistics 51*(3), 239–246.

Shy, O., R. Stenbacka, and V. Yankov (2014). Limited deposit insurance coverage and bank competition. *Journal of Banking and Finance 71*, 95–108.

Figure 1: Impact of the higher deposit insurance limit (and a 95% confidence interval) on the spread between partially- vs. fully-insured deposit accounts, broken down by quarter. Sample period 2003Q2-2006Q4

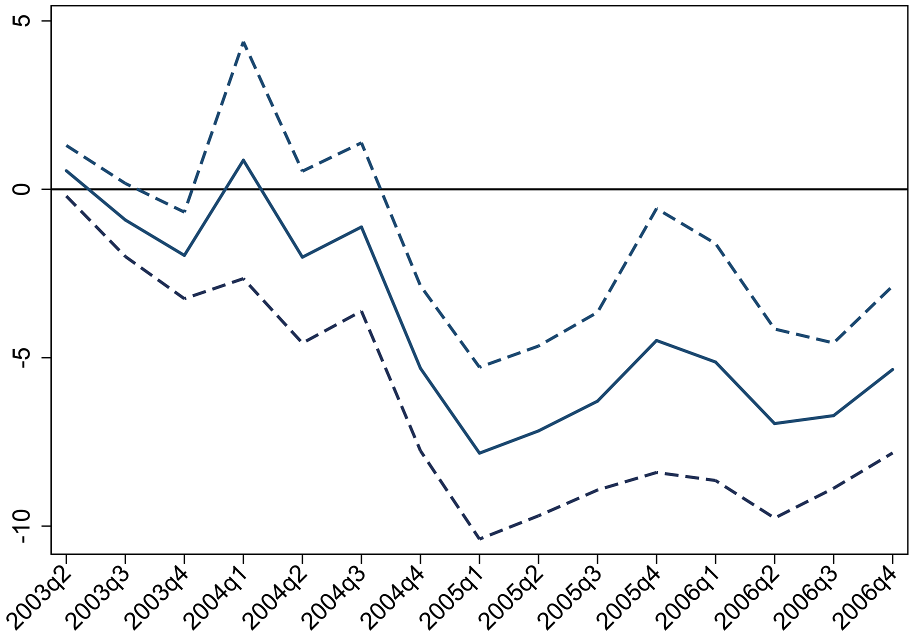

Table 1: Summary statistics of household characteristics before the increase in the deposit insurance limit ("pre-change period"). Affected households are those with deposits that were not fully insured (i.e. at least one deposit account with a balance above the deposit insurance limit). Unaffected households are those with total deposits above $60,000 but with no uninsured deposits. ***, ** and * represent significance at the 1%, 5% and 10% level, respectively.

	Affected HHs (N: 491)				Unaffected HHs (N: 392)				
	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max	Mean Diff.
Insurable Deposit Share	0.689	0.288	0.057	1	0.662	0.312	0.061	1	0.027
Risky Asset Share	0.223	0.267	0	0.943	0.266	0.298	0	0.935	-0.043**
Safe Asset Share	0.046	0.102	0	0.782	0.041	0.088	0	0.664	0.006
Log(Income)	11.056	0.596	8.923	12.073	10.995	0.623	8.923	12.073	0.061
Log(Financial Wealth)	12.685	0.813	11.055	14.959	12.093	0.741	11.044	14.317	0.592***
Home Owner?	0.935	0.247	0	1	0.962	0.192	0	1	-0.027*
Home Equity/Financial Wealth	0.779	0.925	-0.987	7.843	1.276	1.371	-1.234	9.849	-0.497***
Household Size	2.033	0.807	1	6	2.199	1.081	1	8	-0.166***
Married?	0.739	0.439	0	1	0.729	0.445	0	1	0.009
Age	66.429	11.441	30	92	63.533	11.993	31	97	2.897***
Education (High School)	0.289	0.454	0	1	0.293	0.456	0	1	-0.004
Education (Some College)	0.189	0.392	0	1	0.196	0.398	0	1	-0.007
Education (College and Higher)	0.360	0.481	0	1	0.385	0.487	0	1	-0.025
Big City?	0.468	0.499	0	1	0.406	0.492	0	1	0.063*

Table 2: Impact of the higher deposit insurance limit on the spread between partially- vs. fully-insured deposit accounts. The dependent variable is calculated as the difference in the interest rates offered on two "guaranteed investment certificate" (GIC) accounts that are identical in all features, except one account has a minimum balance requirement above 60,000 CADs, while the other has a maximum balance limit of 60,000 CADs. Observations are at the bank-account type-month level. Total number of financial institutions in the sample is 14. All regressions include financial institution and account type fixed effects. Standard errors are clustered at the account type level. *** indicates significance at the 1% level.

	(i)	(ii)
Post	-0.049***	-0.013
	(0.006)	(0.012)
N	18,858	9,859
R-squared	0.366	0.428
Pre-Period	Jan 2003-Dec 2004	Jan 2003-Dec 2003
Post-Period	Jan 2005-Dec 2006	Jan 2004-Dec 2004

Table 3: Impact of the higher deposit insurance limit on account balances. Number of high value deposit accounts (with pre-change balances above the deposit insurance limit) is 426. All regressions include financial institution and households fixed effects. Standard errors are clustered at the household level. *** indicates significance at the 1% level.

Affected · Post	-36,255.1***
	(7,595.1)
Affected	111,391.6***
	(7,368.4)
Post	2,630.9
	(1,751.3)
N	4,630
R-squared	0.544

Table 4: Financial institution-specific changes in the spread (between partially- and fully-insured accounts) and balances of partially-insured deposit accounts following the deposit insurance limit increase.*Pre-Change Spread* is the average spread between partially- and fully-insured deposit accounts offered by a specific financial institution during the pre-change period (January 2003-December 2004). *Pre-Change Balance* is the average balance in a partially-insured deposit account (i.e. an account with a balance exceeding the deposit insurance limit during the pre-change period). Δ*Spread* and Δ*Balance* capture the impact of the deposit insurance limit increase on the spread offered by a financial institution and on the balances of partially-insured deposit accounts. These are regression coefficients obtained by estimating Equations 5 and 6 with the main coefficients of interest interacted with financial institution specific dummies. Coefficients in bold are statistically significant at the 10% level or above. *N (Affected Accounts)* is number of partially-insured accounts at each financial institution. Financial institution names are anonymized for data confidentiality reasons.

	Pre-Change Spread	ΔSpread	Pre-Change Balance	ΔBalance	N (Affected Accounts)
FI-8	0.232	**-0.170**	163.4	-90.3	9
FI-1	0.143	**-0.144**	166.1	**-61.8**	52
FI-11	0.143	**-0.100**	124.1	**-45.1**	53
FI-14	0.047	**-0.053**	146.4	**-56.7**	95
FI-3	0.067	**-0.035**	133.4	-8.9	65
FI-6	0.063	**-0.013**	135.1	**-33.9**	70
FI-12	0.006	-0.006	175.0	-28.5	5
FI-5	0.107	-0.001	250.0	-112.5	2
FI-4	0.166	0.005	101.6	**-58.6**	9
FI-7	0.050	**0.014**	86.9	-39.8	4
FI-2	0.366	0.026	105.0	-42.6	4
FI-10	-0.009	**0.029**	94.8	49.8	4
FI-9	0.081	-0.006			
FI-13			141.6	-20.1	20
FI-15			130.1	-7.4	7
FI-16			117.6	**-32.9**	19

Table 5: Impact of the higher deposit insurance limits on the portfolio share of insurable deposits, risky assets and safe non-deposit assets. Affected households are those with deposits that were not fully insured (i.e. at least one deposit account with a balance above the deposit insurance limit). Unaffected households are those with total deposits above $60,000 but with no uninsured deposits. All specifications include a vector of household characteristics (not reported for brevity). In columns (i) and (iii), these household characteristics vary across the two time periods. In column (ii), only the interaction of the pre-change household characteristics with $Post_t$ are included. In column (iii), marginal effects are reported. Standard errors are clustered at the postal code-based region level. *** is significant at the 1% level.

Panel A: Insurable Deposits			
	(i)	(ii)	(iii)
Affected·Post	-0.079***	-0.111***	-0.076***
	(0.018)	(0.029)	(0.018)
Affected	0.125***		0.135***
	(0.015)		(0.015)
Post	-0.084***	-0.744	-0.069***
	(0.014)	(0.512)	(0.014)
R-squared	0.354	0.795	0.145
Panel B: Risky Assets			
	(i)	(ii)	(iii)
Affected·Post	0.063***	0.079***	0.061***
	(0.016)	(0.027)	(0.016)
Affected	-0.129***		-0.139***
	(0.016)		(0.016)
Post	0.073***	0.484	0.054***
	(0.012)	(0.408)	(0.012)
R-squared	0.333	0.817	0.161
Panel C: Safe Assets			
	(i)	(ii)	(iii)
Affected·Post	0.011	0.019	0.011
	(0.009)	(0.014)	(0.009)
Affected	-0.001		-0.001
	(0.007)		(0.007)
Post	-0.005	-0.111	-0.005
	(0.006)	(0.228)	(0.006)
R-squared	0.031	0.634	0.026
N	1,766	1,766	1,766
Estimation Method	OLS	OLS	Fractional Logit
HH Fixed Effects	No	Yes	No
HH Characteristics	Time-Varying	Pre * Post	Time-Varying

Table 6: Impact of the higher deposit insurance limits on the subcomponents of the "risky assets" category. All definitions and specifications are identical to those in Table 5. In column (iii), marginal effects are reported. Standard errors are clustered at the postal code-based region level. ***, ** and * are significant at the 1%, 5% and 10% levels, respectively.

Panel A: Stocks			
	(i)	(ii)	(iii)
Affected·Post	0.026**	0.016	0.023**
	(0.011)	(0.017)	(0.011)
Affected	-0.038***		-0.043***
	(0.012)		(0.013)
Post	0.023***	0.057	0.010
	(0.008)	(0.317)	(0.009)
R-squared	0.187	0.829	0.149
Panel B: Non-Government Bonds			
	(i)	(ii)	(iii)
Affected·Post	0.005	0.002	0.004
	(0.005)	(0.006)	(0.005)
Affected	-0.008*		-0.009*
	(0.004)		(0.005)
Post	0.001	0.063	0.001
	(0.003)	(0.125)	(0.003)
R-squared	0.033	0.649	0.091
Panel C: Non-Money Market Mutual Funds			
	(i)	(ii)	(iii)
Affected·Post	0.032**	0.061**	0.036**
	(0.016)	(0.026)	(0.016)
Affected	-0.084***		-0.089***
	(0.015)		(0.016)
Post	0.049***	0.364	0.039***
	(0.013)	(0.408)	(0.012)
R-squared	0.159	0.778	0.089
N	1,766	1,766	1,766
Estimation Method	OLS	OLS	Fractional Logit
HH Fixed Effects	No	Yes	No
HH Characteristics	Time-Varying	Pre * Post	Time-Varying

Table 7: Parallel trends test via placebo regressions. Placebo pre-change period is 2000-2002 and the placebo post-change period is 2003-2004. $Affected$ is defined as of 2003-2004. All definitions and specifications are identical to those in Table 5. In column (iii), marginal effects are reported. Standard errors are clustered at the postal code-based region level. ***, ** and * are significant at the 1%, 5% and 10% levels, respectively.

Panel A: Insurable Deposits			
	(i)	(ii)	(iii)
Affected·Post	0.055	0.043	0.049
	(0.033)	(0.048)	(0.032)
Affected	0.041		0.054*
	(0.033)		(0.032)
Post	0.049**	0.219	0.049**
	(0.024)	(0.743)	(0.023)
R-squared	0.293	0.601	0.124
Panel B: Risky Assets			
	(i)	(ii)	(iii)
Affected·Post	-0.019	-0.002	0.019
	(0.025)	(0.038)	(0.025)
Affected	-0.042		-0.042
	(0.029)		(0.029)
Post	-0.041**	-0.325	-0.041**
	(0.018)	(0.544)	(0.018)
R-squared	0.294	0.632	0.137
Panel C: Safe Assets			
	(i)	(ii)	(iii)
Affected·Post	-0.004	-0.006	-0.002
	(0.017)	(0.026)	(0.016)
Affected	-0.001		-0.002
	(0.015)		(0.013)
Post	-0.019	-0.024	-0.021
	(0.013)	(0.369)	(0.013)
R-squared	0.045	0.206	0.031
N	890	890	890
Estimation Method	OLS	OLS	Fractional Logit
HH Fixed Effects	No	Yes	No
HH Characteristics	Time-Varying	Pre * Post	Time-Varying

Table 8: Baseline estimation with home value (in 100,000 CADs) and home equity (in 100,000 CADs) included as explanatory variables. All other definitions are identical to those in Table 5. All specifications include time-varying household characteristics. Standard errors are clustered at the postal code-based region level. ***, is significant at the 1% level.

	Bank Deposits	Risky Assets	Safe Assets
Affected·Post	-0.078***	0.059***	0.011
	(0.018)	(0.157)	(0.009)
Affected	0.125***	-0.127***	-0.001
	(0.015)	(0.016)	(0.006)
Post	-0.084***	0.071***	-0.004
	(0.014)	(0.012)	(0.006)
Home Value	0.010	-0.009	0.001
	(0.013)	(0.012)	(0.004)
Home Equity	-0.011	0.016	0.001
	(0.013)	(0.012)	(0.004)
R-squared	0.354	0.335	0.031
N	1,766	1,766	1,766

Table 9: Re-estimation of baseline specifications with a sub-sample comprising of households that already had non-money market mutual funds in their portfolios in the pre-change period. All definitions and specifications are identical to those in Table 5. In column (iii), marginal effects are reported. Standard errors are clustered at the postal code-based region level. ***, ** and * are significant at the 1%, 5% and 10% levels, respectively.

Panel A: Insurable Deposits			
	(i)	(ii)	(iii)
Affected·Post	-0.058**	-0.093*	-0.057**
	(0.029)	(0.051)	(0.029)
Affected	0.131***		0.131***
	(0.019)		(0.018)
Post	-0.044**	-0.658	-0.043**
	(0.019)	(0.728)	(0.019)
R-squared	0.293	0.773	0.077
Panel B: Risky Assets			
	(i)	(ii)	(iii)
Affected·Post	0.061**	0.057*	0.058**
	(0.023)	(0.044)	(0.023)
Affected	-0.144***		-0.146***
	(0.021)		(0.021)
Post	0.041**	0.506	0.037**
	(0.018)	(0.729)	(0.018)
R-squared	0.293	0.786	0.081
Panel C: Safe Assets			
	(i)	(ii)	(iii)
Affected·Post	-0.003	0.008	-0.001
	(0.013)	(0.021)	(0.013)
Affected	0.003		0.002
	(0.011)		(0.011)
Post	-0.005	-0.202	-0.006
	(0.009)	(0.358)	(0.009)
R-squared	0.048	0.639	0.034
N	844	844	844
Estimation Method	OLS	OLS	Fractional Logit
HH Fixed Effects	No	Yes	No
HH Characteristics	Time-Varying	Pre * Post	Time-Varying

Table 10: Financial advice regressions. The dependent variable is either the total number of times the household sought financial advice in the last 12 months (Panel A) or the total number of times the households sought advice from a depository institution (Panel B). All definitions and specifications are identical to those in Table 5, except a negative binomial specification is used in column (iii).

Panel A: Total Advice			
	(i)	(ii)	(iii)
Affected·Post	0.148	0.164	0.068
	(0.177)	(0.293)	(0.094)
Affected	-0.251		-0.074
	(0.184)		(0.095)
Post	-0.122	0.065	-0.055
	(0.137)	(4.472)	(0.079)
R-squared	0.117	0.762	0.031
Panel B: Advice from Depository Institutions			
	(i)	(ii)	(iii)
Affected·Post	0.021	0.048	0.047
	(0.114)	(0.176)	(0.138)
Affected	0.028		0.052
	(0.114)		(0.137)
Post	-0.043	-1.138	-0.059
	(0.089)	(2.462)	(0.112)
R-squared	0.022	0.674	0.009
N	1,766	1,766	1,766
Estimation Method	OLS	OLS	Negative Binomial
HH Fixed Effects	No	Yes	No
HH Characteristics	Time-Varying	Pre * Post	Time-Varying