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Banking Crises, Bail-ins and Money Holdings

Martin Brown*, Ioanna S. Evangelou** and Helmut Stix***

January 2018

Abstract

We study changes in deposit and cash holdings by households following the 2013 banking crisis in Cyprus. During this crisis the two largest banks in the country were resolved involving a bail-in of uninsured depositors and debt holders. Our analysis is based on anonymized survey data covering households with differential exposures to the resolved banks: uninsured deposits, subordinated debt and equity holdings. In line with the portfolio theory of money demand, we find that in the intermediate aftermath of the crisis households significantly reduced their holding of bank deposits and increased their cash holdings. This flight to cash was much stronger for clients which experienced a bail-in of deposits or subordinated debt than for households which held equity in the resolved banks or did not suffer any financial loss. In the medium term, however, we find no difference in depositor confidence or intended money holdings between households which suffered a bail-in and those which did not.

Keywords: Financial crises, bank resolution, bail-in, deposits, cash, money demand

JEL Codes: E41, G01, G11, G21, G28

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1. Introduction

Between 2007 and 2011, 22 countries in Europe and North America experienced a severe banking crisis. In almost all of these countries governments bailed-out large commercial banks imposing substantial costs on tax payers (Laeven and Valencia, 2012). As a response to the negative externalities of bank failures, the prudential regulation and resolution mechanisms for banks are being overhauled. A cornerstone of the new bank resolution policy is the bail-in of (subordinated) debt holders and uninsured depositors.¹ As opposed to government bail-outs, bail-ins arguably reduce the costs of bank failures for taxpayers, imposing these instead on bank creditors. However, many policy makers fear that bank-bail-ins may undermine confidence in the banking sector and jeopardize financial stability.²

In this paper we examine the impact of a banking crisis which included a significant bail-in of debt holders and uninsured depositors on money holdings. We study the reaction of private households to the banking crisis which unfolded in Cyprus in 2013. Within a period of less than two weeks, bank clients witnessed: (i) the temporary closure of all banks, (ii) a proposal to impose a levy on all insured and non-insured deposits, (iii) the parliamentary refusal to implement this levy, (iv) the announcement of a resolution process for the two largest banks involving a bail-in of uninsured depositors and debt holders, and (vi) the introduction of capital controls limiting account access for all depositors.

¹ http://www.financialstabilityboard.org/wp-content/uploads/r_111104cc.pdf?page_moved=1. Bail-ins are, for example, an integral part of the EU Bank Recovery and Resolution Directive or the joint FDIC-Bank of England proposal for a single point of entry resolution plan for large global banks. See Chennells and Wingfield (2015) for a discussion of the role of bail-ins in bank resolution policy.

² In May 2017, the Italian government ruled out a bail-in of depositors for troubled banks in the region of Veneto. Instead, the authorities sought approval from the EU for a government-sponsored bail-out of the two banks (<http://www.reuters.com/article/italy-veneto-banks-idUSL8N1IR27D>, accessed August 2017).

Figure 1 here

Aggregate data suggest that the banking crisis in Cyprus led to a significant reallocation of money holdings from bank deposits to cash. Figure 1, Panel A displays the aggregate volume of customer deposits at banks in Cyprus over the period 2012:03 – 2015:03. The picture suggests that the March 2013 crisis constituted an unexpected shock to resident depositors.³ The aggregate level of deposits by residents remained constant from early 2012 to February 2013. The figure documents a strong outflow of resident (and non-resident) deposits in the months after the crisis. Indeed, by September 2013 resident deposits amounted to just 76% of their pre-crisis level, with bailed-in deposits making up less than one-third of this decline. Figure 1, Panel B shows the net total value of cash (euro banknotes) issued in Cyprus between 2012 and 2015.⁴ There was no increase in cash-holding in the period immediately preceding the crisis. In March 2013, net cash issuance more than doubled, suggesting a significant flight to cash among resident households and businesses. Mirroring the decline of bank deposits displayed in Panel A, net cash issuance continued to rise until autumn 2013 and stabilized thereafter.

In this paper we use anonymized household survey data to shed light on how the change in money holdings in the immediate aftermath of the crisis is related to the exposure of households

³ The publicly available MFI statistics underlying Figure 1 allocate ‘brass plate’ special purpose entities (i.e. holding company with non-resident owners and overseas activities) to resident deposits. In December 2012, these accounted for approximately €5 billion of the €43 billion resident deposits.

⁴ For each participating central bank, the Eurosystem records statistics on banknotes that are issued in a specific country. Under normal circumstances, these inflows to and outflows from the respective central bank are not informative about the actual value of euro banknotes that is circulating in each euro area member state because currency can move freely across borders. However, the introduction of restrictive measures on the free movement of capital in combination with Cyprus’ geography, render these statistics informative about currency in circulation.

to the resolved banks. In addition, we examine how the banking crisis and household exposure to a bail-in impacts on medium-term depositor confidence and intended money holdings. Our analysis covers a sample of 800 Cypriot households which had significant bank deposits (more than €5,000 in a term-deposit account). The survey provides information on depositor behaviour and confidence over a 12-month period from January 2013 to January 2014. The sample includes households with very different exposures to the resolved banks: First, the sample covers households which were clients of the two resolved banks as well as clients of other financial institutions. Importantly, the sample also covers households with deposits below and above the deposit insurance threshold (€100,000). Finally, the sample covers households which did / did not hold subordinated debt or equity issued by the two resolved banks. We are thus not only able to compare the reaction of households which had some exposure to the resolved banks to those who did not. Among those households exposed to the resolved banks we can also compare the behaviour of those with a bail-in of uninsured deposits to those with a bail-in of subordinated debt and to those which suffered significant losses on equity shares.

We document a significant flight from bank deposits to cash among private households in the aftermath of the crisis. One in five of the surveyed households report that they reduced their bank deposits by more than 25%. A similar share report that they increased their cash holdings. Importantly, the propensity to reduce bank deposits and increase cash holding is strongly related to household exposure to bank bail-ins. We find that among those households which experienced a financial loss, households with a bail-in of deposits or of bonds were equally likely to reduce deposits and increase cash holdings. By contrast, households which experienced equity losses only were no more likely to reallocate their money holdings than households which incurred no financial loss at all. These findings suggest that the key driver of the reallocation of households' money holdings is a loss in confidence in banks, rather than negative wealth effects. All results are robust to a wide set of socioeconomic controls accounting for potential heterogeneity in

household income, financial and real assets, financial sophistication, and a households portfolio of bank relationships.

We further document a significant reallocation of deposits across banks in the aftermath of the crisis. One in seven of the surveyed households reported a significant transfer of deposits (more than €5,000) between banks. We find that household exposure to the crisis also impacted on the allocation of deposits across banks: The propensity to transfer deposits away from a bank was significantly higher for accounts with the two resolved banks than for accounts with other banks. Estimates based on a sample of households with multiple bank accounts – and including household fixed effects – suggest that these findings are not driven by unobserved heterogeneity between clients of resolved banks and non-resolved banks. The magnitude of this response must be seen in the context of then existing restrictions on capital mobility, suggesting a more substantial response without restrictions.

To gauge the longer-term impact of the crisis on depositor confidence and future household money holdings we resort to survey information on hypothetical asset allocation and depositor confidence at the time of the survey. We find a low level of confidence in banks which extends well beyond those households that were bailed-in. Moreover, we find that the intended money holdings of households is hardly related to the personal incurrence of a bail-in as a result of the bank resolution process. Thus, while the experience of a bail-in leads to much stronger short-term changes in money holdings, it seems that longer-term confidence in banks and money holdings is largely determined by the experience of the crisis per se rather than by the personal experience of a bail-in.

Our findings contribute primarily to the empirical literature studying the impact of financial and economic crises on household finance. Malmendier and Nagel (2011) document that individuals who have experienced low stock market returns throughout their early lives are less likely to participate in the stock market, invest a lower fraction of their liquid assets in stocks if

they participate, and are more pessimistic about future stock returns. Osili and Paulson (2014) document that migrants to the U.S. who lived through a systemic banking crisis in their home countries are less likely to have checking accounts than migrants from the same countries who did not live through a banking crisis. Brown and Stix (2015) document that the experience of past banking and currency crises increases the likelihood that individuals hold bank deposits in foreign currency as opposed to the local currency.⁵ We complement this literature in one very important dimension: We examine how the exposure of a household to the banking crisis impacts on confidence and behaviour, i.e. whether the household experienced a financial loss due to the bank resolution process, and what type of loss the household experienced. Understanding how crisis exposure relates to behaviour at the individual level is crucial to the design of bank resolution policy.

Our findings also contribute to the growing literature on household-level reactions to bank failures.⁶ Davenport and McDill (2006) and Iyer et al. (2016) use client-level administrative data to study the reaction of retail depositors to individual bank distress.⁷ Van der Cruisen et al. (2012) and Brown et al. (2017) use household-level survey data to examine the reaction of retail

⁵ Ehrmann and Tzamourani (2012) show that individuals who have lived through an episode of hyperinflation express a substantially larger concern about inflation.

⁶ Most studies of bank failures and bank funding rely on bank-level balance-sheet data or interest rate data to study the impact of bank distress on the flow and pricing of insured vs. non-insured deposits. Studies which examine bank balance-sheet data provide evidence that distressed banks suffered stronger deposit outflows during the Great Depression (Saunders and Wilson, 1996, Calomiris and Mason, 1997), the U.S. Savings and Loan crisis (Goldberg and Hudgins, 2002), the financial crises in Latin America in the 1980s and 1990s (Peria and Schmukler, 2001; Schumacher, 2000) and Eastern Europe (Karas et al., 2013; Hasan et al., 2013). Studies of bank-level interest rates provide evidence for market discipline by relating bank risk to changes in deposit interest rates for uninsured deposits (Demirguc-Kunt and Huizinga, 2004; Ellis and Flannery, 1992; Hannan and Hanweck, 1988).

⁷ Iyer and Puri (2012) provide household-level evidence on withdrawal behaviour in a banking panic.

depositors to bank distress and bank bail-outs during the 2007-2009 financial crisis.⁸ Iyer et al. (2017) as well as Bonfim and Santos (2017) examine reactions of depositors to changes in deposit insurance coverage and the credibility thereof. We contribute to this literature by providing evidence of household reactions to bank bail-ins and capital controls – a scenario which is highly relevant in light of future bank resolution policy, but has not been studied before.

Finally, we contribute to the extant literature studying household demand for money. In line with inventory models of money demand previous research has documented that the allocation of money holdings between cash and bank deposits is related to interest rates and the costs of converting financial assets to money (see e.g. Alvarez and Lippi 2009). Our findings rather support portfolio models of money demand (Tobin 1958) which predict that changes in the perceived risk of returns on bank deposits should lead households to reduce their deposits and increase cash holding. Stix (2013) documents that weak trust in the banking sector is associated with higher cash savings by households. We document how an unexpected banking crisis leads to a reallocation of money holdings from deposits to cash.

The remainder of the paper is organized as follows. Section 2 describes the institutional background to the paper. Section 3 presents the data and methodology. Sections 4 to 6 report the empirical results. Section 7 concludes.

2. Background

Cyprus joined the European Union in May 2004 and became a member of the eurozone in January 2008.⁹ Between 2004 and 2007, the economy displayed average annual real GDP growth of 4% and public debt fell from over 70% to less than 50% of GDP. In 2007, the Cypriot

⁸ Jansen et al. (2014) employ hypothetical scenarios in a household survey to examine the influence of banking crises on depositor confidence.

⁹ This paragraph relies heavily on Michaelides, 2014.

commercial banks boasted an average return on equity of 20%.¹⁰ By the end of 2011, public debt had soared back to over 70% of GDP and the losses of the commercial banks amounted to 30% of their equity.

The deterioration of the Cyprus sovereign debt position between 2007-2011 was driven by sharp increases in public spending financed by foreign borrowing.¹¹ The increased fragility of the Cypriot banking sector during the same period had multiple causes, concurrent with the varying intermediation activities across the sector. The banking sector is dominated by two types of financial institutions: commercial banks and cooperative credit institutions (CCIs). In 2011, bank assets amounted to €131.6 billion (7.4 times GDP).¹² As in other peripheral countries of the eurozone the major Cypriot commercial banks (Bank of Cyprus, Cyprus Popular Bank, Hellenic Bank) had substantial exposure to the domestic real estate sector, and in particular to property developers. The abrupt end of the real estate boom after 2008 led to a deterioration in their domestic loan quality. The major Cypriot banks also had substantial risky cross-border exposures. On the one hand, they were financed to a significant level by wholesale deposits of non-residents and cross-border interbank loans. On the other hand, they had substantial foreign assets¹³, in particular Greek government bonds and loans to the Greek private sector. In

¹⁰ Association of Cyprus Banks, Annual Report 2007/2008.

¹¹ After a new government came into power in February 2008, government expenditures increased by 5% of GDP, mainly as a result of higher social transfers and public wages. At the same time, public revenue declined as the domestic real estate boom came to a halt and with this real-estate tax revenues. The fiscal deficit was financed by foreign borrowing: the share of Cypriot public debt held abroad rose from just over 20% in 2007 to more than 50% in 2011 (see Michaelides 2014).

¹² These calculations are made using ESA1995 definitions. Subsequent changes in the statistical methodology (ESA 2010) have lowered these ratios.

¹³ In the context of Greece one cannot describe these as assets, other than in strictly accounting terms. Economically, they were proved to be liabilities.

November 2011, the haircut on Greek government bonds as a result of the Greek Private Sector Involvement imposed a €4.5 billion asset write down on Cypriot banks. This sudden loss wiped out 58% of aggregate bank equity and triggered substantial withdrawals of non-resident deposits and wholesale funds. As a consequence, Cyprus Popular Bank had to resort to emergency liquidity assistance (ELA). This bank was nationalized in June 2012.

In contrast to the large commercial banks, the cooperative credit institutions are primarily focused on retail banking for domestic clients. As a consequence, the CCIs did not bear write-downs on foreign (e.g. Greek) assets, nor were they subject to heavy losses on domestic property development loans. Nevertheless, the CCIs required a combined recapitalization of €1.5 billion in 2012, equaling 8.8% of their total asset volume.¹⁴ The massive losses of the CCIs seem to have been driven by weak governance and a weak culture of loan repayment.¹⁵

In June 2012, Cyprus applied to the Eurogroup for financial assistance towards a recapitalization of the banking sector and fiscal consolidation. The first political agreement between the Cypriot government and the Eurogroup was reached on 16 March 2013. This initial agreement featured a €10 billion support programme which was to be complemented by a one-off “stability” levy on all deposits (insured and non-insured) of all Cypriot banks.¹⁶ The proposal of a levy on insured deposits led to widespread concerns across Europe. Amidst this public outcry, the Eurogroup reaffirmed on 18 March the importance of fully guaranteeing deposits

¹⁴ In December 2012, the CCIs held total assets of €17.1 billion, corresponding to 95.5% of Cypriot GDP. The €1.5 billion recapitalization package for the CCIs was agreed with the Troika in exchange for their consolidation and restructuring. As a result, several CCIs were merged and their total number reduced significantly to 18.

¹⁵ For historical, social and political reasons this segment of the banking system was not under the unified supervision mechanism of the Central Bank of Cyprus (CBC).

¹⁶ The first agreement proposed a 6.7% levy on all insured deposits (up to €100,000 euro) and a 9.9% levy on all non-insured deposits.

below the deposit insurance threshold of €100,000. The proposed stability levy was rejected by the Cypriot parliament on 19 March.

On 25 March 2013, a second agreement between the Eurogroup and the Cypriot government was reached. This agreement featured the winding-down of Cyprus Popular Bank. Insured deposits of the bank, together with its outstanding ELA and assets, were moved to the balance sheet of the Bank of Cyprus. The claims of uninsured depositors and debt holders and equity holders of Cyprus Popular Bank were wiped out. The agreement further featured a recapitalization of the Bank of Cyprus through a partial bail-in of uninsured depositors¹⁷ as well as a full bail-in of debt holders.

The total bail-in of uninsured deposits from Cyprus Popular Bank and the Bank of Cyprus amounted to an estimated €7.9 billion, or more than 11% of the total deposit volume of Cypriot banks before the crisis. Resident depositors accounted for approximately €3.2 billion of the deposit bail-in, amounting to 7.5% of their pre-crisis deposit volume. In addition, roughly one billion euro in outstanding contingent convertible (CoCo) bonds were bailed-in during the

¹⁷ The partial bail-in of depositors at Bank of Cyprus was effected at the end of March 2013 by decrees of the national resolution authority. At that time, 37.5% of all uninsured deposits was converted into equity while a further 22.5% was blocked in case of a further bail-in and another 30% was temporarily blocked; only 10% of the uninsured deposit was available to the holder, subject to the capital controls. In July 2013, the details of the bail-in were finalized, with the total bail-in amounting to 47.5% of uninsured deposits. A further 37.5% of these deposits was converted to six, nine and twelve-month time deposits while the remaining amount of uninsured deposits was released (but subject to general capital controls). Uninsured deposits at Cyprus Popular Bank were left (at Cyprus Popular Bank) to absorb losses from the winding down and can expect to collect from the sale of the remaining assets.

resolution process of the two large banks. These subordinated bonds were widely held by resident retail investors.¹⁸

From March 16 until March 27 all Cypriot banks remained closed. On March 28 the banks reopened, but capital controls were imposed, limiting the access of households to their accounts. Initially, the capital controls limited cash withdrawals from accounts to 300 euro per day per person. Transfers between accounts with different banks within Cyprus as well as cross-border transfers were also restricted.¹⁹ Moreover, the opening of new accounts was forbidden. From April 2013 onwards these capital controls were gradually relaxed, but were not completely lifted until April 2015. See Appendix A9 for a detailed timeline of the capital controls.

3. Data

Our analysis is based on a survey of 807 households which was implemented by the Central Bank of Cyprus in February 2014.²⁰ The unique feature of this survey is that it oversamples wealthy households and thus includes a significant number of households which experienced

¹⁸ Data provided by the CBC suggest that at the beginning of 2013 roughly 12,000 households (among the total resident population of the part of the island under the control of the Republic of Cyprus of around 841,000, which corresponded to 303,242 households, according to Cyprus Statistical Service Census of population 2011) held CoCo bonds of one of the two resolved banks. Many retail investors had bought these securities in 2011 and 2012 in the belief that they were high-yielding but safe instruments (see https://www.centralbank.cy/images/media/pdf/LSE_ICFCBS_Final_Report_10_13.pdf, page 98).

¹⁹ There were certain exceptions: transfers for payment of salaries, tuition fees and student living expenses, payments via cards not exceeding €5,000 per month, and payments up to €5'000 per day for normal business activities.

²⁰ The implementation of this survey was part of the Memorandum of Understanding on Specific Economic Policy Conditionality with the European Commission, in liaison with the ECB, as well as the IMF - Second Review of autumn 2013.

direct losses on financial assets (uninsured deposits, bank debt, bank equity) as a result of the resolution of Cyprus Popular Bank and Bank of Cyprus.²¹

Survey design

The sampling frame for the survey was the anonymized depositor register of Cyprus as of end 2013, covering more than 1.5 million accounts held by natural persons. Non-resident households and households younger than 20 or older than 82 were excluded from the sampling population. Importantly, households with term deposits of less than €5,000 (70% of all accounts) were also dropped in order to focus on a sub-population with a significant exposure to the banking sector. The sample population was stratified by bank to ensure representativeness of the depositor structure across banks. Within each bank two samples were drawn: First, a sample of depositors with uninsured deposits (more than €100,000 in term deposits) at that bank. Second, a sample of fully insured depositors (between €5,000 and €100,000 in term deposits) at that bank. A random sample of the survey population was selected for surveying, whereby depositors with uninsured deposits were oversampled.²² In total 3,000 households (40% with uninsured deposits) were selected for surveying and 807 households (49% with uninsured deposits) responded. Interviews were conducted face to face by experienced interviewers. The interviews lasted, on average, 35 minutes and took place at the residence of the respondents or at a location of their choice. The respondents were not remunerated for their participation. However, at the beginning

²¹ A group of economists and supervisors from the CBC designed the questionnaire. Input was provided by economists from the Oesterreichische Nationalbank. The data collection was conducted by the University of Nicosia/IMR on the basis of a list of individuals as distributed by the CBC (who conducted the sampling) containing only the contact details of the participants and in no case details of their deposit accounts.

²² High-wealth depositors account for 40% of the random sample compared to 8% of the survey population.

of each interview the respondent was informed about the policy purpose of the survey in order to encourage participation.²³

The survey questionnaire was designed to elicit the impact of the banking crisis on depositor confidence. To this end households reported on their changes in the holding of bank deposits and cash during 2013. Further, they reported their levels of trust in banks as per February 2014 as well as their hypothetical asset allocation in the absence of capital controls. Information was further gathered on socioeconomic characteristics (e.g. age, education, gender, household income and wealth), financial literacy and the approximate geographical location of the households. Appendices A1 and A2 provide definitions while Table 1 and Appendix A3 provide summary statistics of all variables employed in our analysis.

Appendix A4 documents that the sociodemographic characteristics of the surveyed households are consistent with those of the households covered by the 2011 census of the Cyprus statistical service and the 2010 Cyprus wave of the Eurosystem Household Finance and Consumption survey. The direction of differences, e.g. higher education, higher home ownership rates, higher share in urban areas, lower unemployment, etc. in our sample vis à vis the entire Cypriot population confirms that our sample oversamples affluent households.

Household exposure to the banking crisis

Households in our sample are characterized by different exposures to the 2013 banking crisis (Figure 2). Importantly, the survey allows us to establish whether households experienced a direct financial loss as a result of the resolution of Cyprus Popular Bank and the Bank of Cyprus. Furthermore, we can also establish which types of losses households experienced. Respondents were first asked whether their household was a customer of either of the resolved

²³ A letter signed by an authorized person in the CBC was sent to the households selected to participate approximately one week before the first telephone contact by the survey company.

banks prior to March 2013. The households which reported that they were clients were subsequently asked whether they were affected by the bail-in of uninsured deposits. Second, all respondents (clients and non-clients) were asked whether their household suffered a substantial loss (more than €5,000) due to the holding of subordinated debt (bonds) of either of the two resolved banks. Third, all respondents were asked whether their household suffered a substantial loss (again €5,000) due to the holding of equity of either of the resolved banks.

Figure 2 here

Figure 2 documents that 440 of the household in our sample (55 percent) experienced a direct loss on financial assets due to the bank resolution process. As shown in Panel A of the figure, a significant share of households (n=228) suffered a bail-in of uninsured deposits or a bail-in of subordinated bonds (n=130). Surprisingly, losses on bank equity holdings are reported to be the most common source of financial losses (n=351) in our sample of households. This finding reflects the oversampling of wealthy households.

In light of recent policy discussions over the prioritization of debt claims in bank resolution we classify households by three different types of losses (see Figure 2, Panel B). The variable *Deposit bail-in* captures all households which suffered a bail-in of uninsured deposits (17 percent of the sample).²⁴ The variable *Bond bail-in* captures all households which suffered a bail-in of (subordinated) debt but no bail-in of deposits (8 percent of sample). The variable *Equity loss* captures all households which suffered a loss on bank equity but no bail-in of uninsured deposits or debt (20 percent of sample). Our classification of households by loss type allow us to examine whether households money holdings react differently to a bail-in of deposits as opposed to subordinated debt. Moreover, by comparing the reaction of households which experienced a bail-

²⁴ The reported sample means refer to the weighted sample. Figure 2 reports the unweighted number of cases.

in of deposits or debt to households which suffered equity losses we can at least partially disentangle the impact of a loss in confidence from the impact of negative wealth effects.

Our sample includes 358 households (45 percent) which did not experience a direct loss on financial assets. These households allow us to disentangle the impact of the underlying banking crisis from the effect of being personally exposed to the resolution of distressed banks. Controlling for the impact of the underlying crisis is particularly important as several incidents during the crisis are likely to have undermined broad public confidence in the banking sector. In particular, the initial proposal of a levy on insured and uninsured deposits may have undermined confidence in the financial sector safety-net. Moreover, the introduction of capital controls on bank accounts may have further undermined confidence.

Among the households without financial losses due to bank resolution we can distinguish whether or not they were clients of the resolved bank prior to the crisis. By comparing the behaviour of these two groups of households we can examine potential contagion effects of bank resolution and bail-ins to “less-affected” households. In particular, we can examine whether clients of the resolved banks are more likely to change their money holdings than non-clients, even if they did not experience a direct financial loss. As Figure 2 shows, our sample covers both a significant number of households which are clients of the resolved banks but experienced no loss on financial assets (25 percent) as well as households without losses which are not clients of the resolved banks (20 percent).

4. The Flight from Deposits to Cash

Our main dependent variables capture the change in households’ money holdings, i.e. cash and bank deposits in the immediate aftermath of the banking crisis. First, households report on whether (apart from any loss due to the bail-in) their total deposits held with banks and CCIs in

Cyprus decreased between January 2013 and January 2014. If they do report a decrease, they are subsequently asked to report (in categories) the actual percentage decreased. The answers to these questions are captured by the dummy variables *Deposits decreased* and *Deposits decreased > 25%* which are both defined at the household-level. All surveyed households were additionally asked to report on the extent of their cash holdings at the time of the survey (January / February 2014) and compare this to one year before the survey.²⁵ The variable *More cash* takes on the value one if the household reports more cash holding than one year ago. Table 1 presents summary statistics for all outcome variables employed in our analysis. The table shows that 21 percent of the households reduce their total deposit volumes by at least one-quarter, while the same share of households reports an increase in cash holdings.

Table 1 here

Methodology

We examine to what extent those households which experienced a loss on financial assets due to the bank resolutions are more likely to withdraw deposits and hold cash. The outcome variables of interest are *Deposits decreased*, *Deposits decreased 25%* and *More cash*. Our explanatory variables capture the different types of financial losses we classified in section 3: *Deposit bail-in*, *Debt bail-in*, and *Equity loss*. The reference group in our analysis are households which did not experience a financial loss due to the bank resolution process.

We aim to identify the following average treatment on the treated effect (ATET):

$$E[Y_{1i} - Y_{0i} | D_i = 1] = E[Y_{1i} | D_i = 1] - E[Y_{0i} | D_i = 1]$$

²⁵ Specifically, households were asked to compare their cash holding to their weekly expenses, their monthly salary and their total savings.

where Y_{1i} measures potential changes in money holdings for respondent i if that respondent experiences a (particular type of) financial loss, Y_{0i} measures potential changes in deposit and cash holdings for respondent i if that respondent does not incur a financial loss, and D_i is a dummy variable which is 1 for respondents which experienced a financial loss. What we observe is the change in money holdings for those households i that experience a loss $E[Y_{1i}|D_i = 1]$ and those households j which do not experience a loss $E[Y_{0j}|D_j = 0]$. Our identification concern is one of selection: Compared to households which did not experience a loss, households which did experience a financial loss may have displayed a different change in money holdings following the banking crisis even if they had not experienced the financial loss; $E[Y_{0i}|D_i = 1] \neq E[Y_{0j}|D_j = 0]$.

It is very plausible that the treated group (those which experience a loss) displays different socioeconomic attributes (financial sophistication, risk attitudes, income levels), faces different economic shocks (job loss, business insolvency) or has a different portfolio of bank relationships than the control group which would lead them to reduce their deposits and hold more cash – even if they had not experienced a financial loss due to bank resolution. Existing empirical evidence suggests that financial market participation – i.e. the holding of bonds and equities - is correlated with household wealth and age, but also with education and financial literacy as well as with economic activity (self-employment) and risk attitudes (see Guiso and Sodini 2013). Likewise, existing evidence shows the holding of uninsured deposits is correlated with wealth, income, education, and financial literacy (see Brown et al. 2017). The same evidence suggests that large commercial banks (which in our case are the resolved banks) may attract a different clientele than smaller banks or cooperatives. For example, these clients may be more financially sophisticated and have a broader portfolio of other bank relationships. That said, in Cyprus it was, and still is, common for depositors to have multiple accounts, i.e. both in a retail bank and in a coop, irrespective of their socioeconomic background and financial sophistication.

Our identification strategy relies on a selection on observables approach: We control for a vector of observable socioeconomic characteristics X_i which may confound the relationship between the treatment and the outcome variables. Our identification assumption is thus that conditional on these confounders X_i the selection effect is negligible: $E[Y_{0i}|D_i = 1, X_i] = E[Y_{0j}|D_j = 0, X_j]$. We estimate the following equation in an ordinary least squares model:

$$\begin{aligned}
 [1] \quad Y_i = & \alpha + \beta_1 \cdot \text{Deposit_bail_in}_i + \beta_2 \cdot \text{Bond_bail_in}_i + \\
 & + \beta_3 \cdot \text{Equity_loss}_i + \gamma \cdot X_i + \varepsilon_i
 \end{aligned}$$

whereby Y_i : *Deposit Decreased; Deposit Decreased > 25%; More Cash*

Our survey data provides us with a broad range of socioeconomic variables which capture personal attributes, household economic activity, financial and real assets, as well as the number and scope of bank relationships. For some of these variables the survey elicits pre-crisis levels based on recall. These variables are thus exogenous to the treatment, but may be subject to measurement error. For other variables the survey elicits values for the time of the survey in early 2014. These variables are less likely to be subject to measurement error, but may be endogenous to the treatment. When estimating equation [1] we therefore employ two different sets of control variables X_i . Our basic controls include personal attributes such as age, education and location. We further capture whether the household had *More than 1 bank relationship* and whether the household had a *Loan* prior to the crisis. Moreover, we include an indicator of household changes in money holdings in the run up to the banking crisis: All respondents were asked whether they *Withdrew bank deposits before March 15*, i.e. between January and March 2013.

Our extended controls include confounders that are measured at the time of the survey and are thus potentially endogenous to treatment. These include measures of household real assets (*Real estate ownership*), *Financial literacy* and economic activity (*Self employed*, *State employee*). Our extended controls also include a measure for financial wealth of the household which is not endogenous to treatment. Unfortunately, the survey does not provide information on the overall financial wealth of households before the March 2013 crisis. As a proxy indicator of financial wealth we therefore employ the variable *Uninsured deposit* which takes on the value 1 if the term deposit of the household that was drawn for the survey sample exceeded a volume of €100,000 in March 2013.²⁶

Appendix A2 provides definitions and appendix A3 provides summary statistics of all control variables employed in our empirical exercise. Appendix A5 compares the means of our confounding variables for households with and without financial losses.

Results

Table 2 presents our estimation results for equation [1] where we examine the effects of different types of financial losses on money holdings. We compare the behaviour of households which experienced a bail-in of bank deposits from those households which experienced a bail-in of bonds (but not of deposits) or an equity loss (but no bail in). The reference group are households which did not incur a financial loss. The results suggest that the type of financial loss

²⁶ For customers of commercial banks we can identify whether respondents sampled account was uninsured in March 2013 by making use of information from deposit register data which was provided on an anonymized basis. For customers of CCIs, the deposit register data are not available for March 2013 and therefore we use the register information from the time of the survey in combination with the survey responses about depositor behaviour to impute whether the deposit was uninsured in March 2013. This procedure might contain some margin of error, which we assume to be random. For some households survey responses did not allow us to make this imputation and therefore, the number of observations for *Uninsured deposit* is lower than for the other control variables.

incurred by households strongly affects their immediate change in money holdings. The small and insignificant point estimates for *Equity loss* in columns (1-9) suggest that households which only experience a loss on bank stock values do not display significantly different behaviour than households which incur no financial losses. By contrast, the point estimates for *Deposit bail-in* and *Bond bail-in* suggest that those households which are subject to a bail-in of deposits or bonds are much more likely to decrease deposit holdings and increase cash holdings. The magnitude of these estimates is large, and largely unaffected by the inclusion of our basic and extended set of confounding variables. As shown by columns (3, 6, 9), respondents who experienced a bail-in of deposits (bonds) are 29 (25) percentage points more likely to decrease deposits, 18 (15) percentage points more likely to decrease deposits by more than a quarter and 11 (14) percentage points more likely to hold more cash. F-tests reported in the table confirm that the effect of a deposit bail-in on money holdings is not significantly different from that of a bail-in of bonds, while the effect of either type of bail-in is significantly different from the effect of an equity loss only.

In the appendix we report two robustness checks to the baseline results reported in Table 2. First, we examine whether our results are driven by the fact that households which experienced a bail-in are more more likely to be clients of the resolved banks. In Appendix A6 we show that our baseline results also hold if we limit our analysis to those households which are clients of the resolved banks. Second, we examine to what extent our findings are driven by our classification of households into loss categories. In particular, for the sizeable share of households which incurred multiple losses, we always classify them under the most severe loss category. In Appendix A7 the estimation sample excludes all households with multiple losses.²⁷ Results show

²⁷ Given the low number of households with only a bond bail-in, we merge deposit bail-in and bond bail-in into one category.

that the estimated effects of a personal bail-in are weaker, in particular for *More cash*. However, the results for deposit holdings remain qualitatively unaffected.

Table 2 here

The Table 2 findings provide strong evidence that the type of financial loss incurred by households during a bank resolution process strongly affects their subsequent money holdings. Households which are subject to a bail-in react much more strongly than households which are subject to losses on bank equity. However, the type of assets bailed-in, i.e. (uninsured) deposits or (subordinated) bonds, seems hardly relevant for subsequent household behaviour. These findings suggest that a loss in confidence of banks as a creditor leads to a significant reallocation of money holdings. By contrast, the negative wealth effect of a financial loss - which is also incurred by the holders of bank equity - does not per se seem to trigger such behaviour.

Table 3 here

The findings in Table 2 are consistent with a portfolio model of money demand: An increase in the perceived risk of returns on bank deposits should lead to a reallocation of money holdings from deposits to cash. We would then expect to see that the main reason for households to withdraw deposits is to hoard cash. There are, however, other reasons, why households may reduce deposit holdings during a severe financial crisis like the one which hit Cyprus in 2013. In particular, households may be subject to income shocks and thus need to run down deposit holdings to cover living expenses or pay back outstanding debt.²⁸

²⁸ Between 2011 and 2014 the unemployment rate in Cyprus increased from 6% to 16%.

Table 3 reports on the reasons why households reduced their overall holdings of bank deposits. All households which report that their deposits decreased (n=384) were subsequently asked to indicate the main reasons why they did so. Specifically they were asked whether they reduced deposits in order to cover living expenses, pay back loans, hoard cash, transfer money abroad, or to invest funds in Cyprus (multiple answers were possible). Table 3 presents the answers to this question separately for those households which suffered a bail-in (of deposits or bonds), an equity loss or no loss. The table shows that the most common reason for the decrease in deposits was to cover ongoing living expenses (42% - 78%). However, in line with the portfolio model of money demand, cash hoarding was the second most common reason for deposit withdrawals. Moreover, supporting our interpretation of the Table 2 results we find that cash hoarding was a much stronger motive among households which suffered a financial loss (21%-29%) compared to households which suffered no financial loss (11%).

Table 4 here

Our results so far suggest that a bail in of deposits or bonds undermines the confidence in banks more than the mere observation that other households are subject to bail-ins. Our findings thus suggest that the personal experience of a bail-in increases the saliency of elevated risk to holding bank deposits. This saliency of increased risk to bank deposits may also vary across households which do not suffer a financial loss at all. In particular, households which have an account at one of the resolved banks, may react differently to the banking crisis than households which have no exposure to the resolved banks at all.

In Table 4 we examine the change in money holdings for households which did not experience a financial loss due to the bank resolution process. We compare those households which held an (insured) account at the resolved banks to households which only had accounts

with other commercial banks or cooperative credit institutions. Our explanatory variable *Client of resolved bank* takes on the value 1 only if the household had an account with Bank of Cyprus or Cyprus Popular Bank prior to the crisis. The Table 4 results show that clients of resolved banks are more likely to withdraw deposits and hold more cash than households which are not clients of the resolved banks. However, the precision of these estimates is weak. Together with our Table 2 findings these results suggest that bail-in of deposits or bonds undermine the confidence of bank clients much more than the experience of financial losses per se (e.g. equity losses) or of being a client of a resolved bank.

5. The Reallocation of Deposits across Banks

If households reallocate their money holdings in response to perceived changes in the risk of bank deposits we expect not only a flight from deposits to cash but also a reallocation of deposits across banks. Specifically, we expect that households transfer deposits away from those banks which are perceived to have become more risky towards those banks which have not. In the case of the banking crisis in Cyprus, we conjecture that this would lead to a reallocation of deposits away from the resolved banks to other commercial banks and cooperative credit institutions.

To capture the reallocation of deposits between banks, respondents were asked which banks they had an account with in January 2013, and whether they had a term deposit account with that bank. Respondents were subsequently asked whether they had made a significant transfer of term deposits (at least €5,000) away from any of their banks between January 2013 and the time of the survey.²⁹ The dummy variable *Transfer away* is defined at the household-bank level and indicates whether a household transferred existing time deposits away from a particular bank.

²⁹ The capital controls imposed in March 2013 allowed households to transfer up to €300 per day from a term deposit account to a sight account at the same bank. From May 2013 until the time of the survey natural persons were allowed to transfer €15,000 euro per month from one bank to another within Cyprus. See Appendix 9.

The summary statistics in Table 1 show that 14% of the 1,038 term deposit accounts reported by households in our sample experienced a significant outward transfer of funds.

Figure 3 displays the network of bank relationships (defined by the presence of a current account and/or term deposit account) prior to the crisis in January 2013. The 807 surveyed households report a total of 1,334 bank relationships of which 1,038 feature a term deposit. The survey sampling was stratified by banks to obtain a representative sample of bank relationships. Out of all pre-crisis bank relationships, 42% are held with one of the two resolved banks, 37% are held with cooperative credit institutions (CCI) and 21% are held with other commercial banks. The figure further shows that the majority of households in the sample hold multiple bank relationships. In particular, among the 557 households which had an account with one of the resolved banks 289 also had an account with a CCI and 177 with some other commercial bank.

Figure 3 here

Methodology

Our analysis is focused on the 1,034 pre-crisis bank relationships which feature a term deposit. Our dependent variable *Transfer away* is thus measured at the household-bank level. The explanatory variable *Term deposit at resolved bank* takes on the value of 1 if the pre-crisis term deposit account is with the resolved banks and zero otherwise.

$$[2a] \text{Transfer_away}_{i,j} = \alpha + \beta \cdot \text{Term_Deposit_Resolved_Bank}_{i,j} + \gamma_1 \cdot X_i \\ + \gamma_2 \cdot Z_{i,j} + \varepsilon_{ij}$$

$$[2b] \text{Transfer_away}_{i,j} = \alpha_i + \beta \cdot \text{Term_Deposit_Resolved_Bank}_{i,j} + \gamma_2 \cdot Z_{i,j} + \varepsilon_{ij}$$

In equation [2a] we again employ two sets of (basic and extended) control variables X_i to account for household-level characteristics which may confound the relationship between having a bank account with a resolved bank and the propensity to transfer deposits across banks. Furthermore, we include control variables at the account level $Z_{i,j}$ which may influence the propensity to transfer funds. Previous evidence suggests that the scope of a bank relationship influences the propensity of depositors to withdraw funds from a distressed bank (Brown et al. 2017). We control for the scope of each bank relationship with the variables *Loan at same bank* and *Transaction account at same bank*.

For the significant number of households in our sample which have accounts at the resolved banks as well as at other commercial banks or CCIs (Figure 3), we can estimate the within-household regression presented in equation [2b]. This specification allows us to control for unobserved heterogeneity across households which have accounts with the resolved banks and those who do not with household fixed effects α_i .

Results

Table 5 presents our estimation results for equations [2a] and [2b]. Univariate estimates in column (1) show that households are much more likely to transfer term deposits away from the resolved banks than from other financial institutions. The point estimate of *Term deposit at resolved bank* suggests that term deposit accounts with a resolved bank were 7 percentage points more likely to experience an outflow of at least €5,000. Estimates of equation [2a] in column (2) show that the inclusion of basic and extended household controls as well as account-level controls increase the magnitude of our estimate to 12 percentage points which almost as high as the mean for this sample. The column (5) results show that a within household panel estimate for the sample of households with multiple term deposit accounts yields estimates of similar magnitude and precision: A household which has a term deposit at a resolved and a non-resolved

bank is 11 percentage points more likely to withdraw funds from the resolved bank than other banks.

In columns (3-4) and (6-7) we examine whether the higher propensity to transfer term deposits away from the resolved banks depends on the financial losses of households. Considering our section 4 results we split our sample into those households which suffered a bail-in of deposits or bonds (columns 3, 6) and those households which did not suffer a bail-in (columns 4, 7). A comparison of the point estimates of *Term deposit at resolved bank* in columns (3, 4) suggests that - conditional on household-level and account-level controls the propensity of households to transfer funds away from the resolved banks is higher among those households which suffered a bail-in. However, this finding is not confirmed by our within-household analysis in columns (6, 7). Thus, we find no consistent evidence that the propensity of households to shift term deposits away from the resolved banks is related to a bail-in of deposits or subordinated debt.

Table 5 here

The Table 5 results confirm that the 2013 banking crisis not only triggered a reallocation of money holdings between bank deposits and cash. Again in line with a portfolio model of money holdings, the crisis also triggered a reallocation of deposits across the banking sector. Those banks which were resolved were more likely to suffer deposit withdrawals. However, in contrast to the flight from deposits to cash, the reallocation of deposits across banks is not driven particularly by those households which experienced a bail-in during the crisis.

6. Intended money holdings and depositor confidence

Our analysis so far has studied the actual change in household money holdings in the period between the banking crisis in March 2013 and the timing of our survey in early 2014. These findings must be qualified on two grounds: First, the documented behaviour reflects only the short-term reaction of households to a severe banking crisis. Understanding this short-term reaction of households is important for policy makers as it affects the liquidity of the banking sector and potential interventions by the central bank as a lender of last resort. Moreover, understanding the short-term reaction of household money holdings to a banking crisis has important consequences for the supply of currency, e.g. the provision of large-value bank notes which are suitable as a store of value. That said, our findings for the short-term reaction of money holdings do not necessarily inform us about the medium or long-term impact of banking crises on cash holding bank deposits.

Second, the short-term reaction of money holdings which we observe takes place in a context of capital controls which restrict deposit withdrawals and transfers between accounts. These measures may not have been binding for many households. For example, the maximum withdrawal limit of €300 per day implied that households could withdraw up to €9,000 per month – roughly four times the average monthly wage in Cyprus in 2013.³⁰ However, for some of the more affluent households in our sample these restrictions may have been binding. Also, the existence of the restrictions per se may have triggered concerns over future liquidity management leading to additional cash-hoarding as a short-term precautionary liquidity buffer.

To gauge the longer-term impact of the banking crisis on money holdings we resort to a survey question which elicited hypothetical asset allocation at the time of the survey in early 2014. Households were asked how they would allocate assets of €200,000 if the capital controls were lifted and they were free to choose how to invest these funds. Respondents could allocate

³⁰ <https://tradingeconomics.com/cyprus/wages> (accessed October 2017).

any share of the total amount to (i) deposits at banks or co-operatives in Cyprus, (ii) transfer the funds abroad, (iii) invest the funds in Cyprus, (iv) keep as cash.

The four variables *Share deposits*, *Share cash*, *Share invest in Cyprus* and *Share transfer abroad* capture the share of this hypothetical wealth which households would hold in the respective asset type. We additionally define *Deposit share=0* as a dummy variable which takes on the value 1 if households respond that they would not hold any of this hypothetical amount in a Cypriot bank account. Further, *Deposit share <100k* is a dummy variable which takes on the value 1 if households respond that they would hold less than €100,000 (the deposit insurance threshold) in a bank account in Cyprus.

Summary statistics reported in Table 1 show that on average households would allocate just over half of their assets (51 percent) to money with 40 percent (or €80,000) in bank deposits and 11 percent in cash. They would further invest 36 percent of their assets in Cyprus and transfer 13 percent abroad. The average share of assets allocated to bank deposits masks a wide disparity in responses across households as more than a third of the households would hold no bank deposits while less than a quarter of the households would hold deposits exceeding the deposit insurance threshold

Table 6 here

Table 6 relates the hypothetical money holdings of households to their exposure to the banking crisis. We hereby replicate equation [1b] from section 4 for the following four outcome variables: *Share cash*, *Share deposits*, *Share deposits=0*, and *Share deposits <100K*. Our explanatory variables are *Deposit bail-in*, *Bond bail-in*, and *Equity loss* while households which experienced no financial loss are the reference group. Columns (1, 3, 5, 7) present univariate estimates while columns (2, 4, 6, 8) present estimates including our basic and extended

household-level controls. The estimates in columns (1-4) suggest that household exposure to the crisis hardly affects the intended money holdings of households. Households which suffered a bail-in of uninsured deposits or subordinated bonds are not more likely to hold more cash or less bank deposits. The column (5-8) estimates further suggest that household exposure to the crisis hardly affects the propensity to hold no bank deposits or only insured deposits.

Comparing the Table 2 and Table 6 results we conclude that while a bail-in of deposits or bonds strongly affects short-term changes in money holdings, the incurrence of a bail-in appears to have much less influence on the longer-term confidence of households in the banking sector. To examine the confidence in banks in more detail we resort to a series of survey questions on whether the household considered it safe to place deposits with Cypriot banks at the time of the survey. For each of the four major banks or groups of banks (Bank of Cyprus, Hellenic Bank, CCIs, Greek bank subsidiaries) the household is asked to state whether it is safe (“yes” or “no”) to deposit €200,000 under one name. Likewise, a question was asked for a deposit of €50,000. The dummy variable *Not safe uninsured* takes on the value of 1 if the households stated that it was not safe to deposit €200,000 at any of the four banks / bank-groups (and 0 if considered safe at least one bank). The dummy variable *Not safe insured* takes on the value 1 if a household stated that it was not safe to deposit €50,000 at any of the banks / groups of banks (and 0 if considered safe at least one bank).

The summary statistics for *Not safe uninsured* and *Not safe insured* presented in Appendix A3 show that 71% of the surveyed household do not consider it safe to hold uninsured deposits at any Cypriot bank, while 28% consider it unsafe to hold insured deposits. Thus, the banking crisis in Cyprus seems to have strongly undermined confidence in the banking sector, but less so in deposit insurance. This finding is remarkable given that even insured depositors were threatened by the proposed “stability” levy in March 2013.

Table 7 here

Table 7 relates the confidence of households in the banking sector and the deposit insurance scheme to their personal exposure to the banking crisis. Specifically, we compare the variables *Not safe uninsured* and *Not safe insured* for those households which experienced no financial loss in the crisis to those which experienced a *Deposit bail-in* a *Bond bail-in* (but no deposit bail in) or an *Equity loss* (but no bail-in). The table shows that households which experienced a bail-in of deposits are less confident in holding uninsured deposits at a bank than households which experienced no loss, an equity loss, or a bail-in of bonds. However, the difference between bailed-in depositors and those without a financial loss (10 percentage points) is modest compared to the overall low level of confidence. Likewise, we find only minor differences in confidence towards the deposit insurance scheme between bailed-in households and those households which did not experience a financial loss.

The Table 7 results support our conjecture that the bail-in of households during the banking crisis did not accentuate the low level of confidence in banks compared to those households which experienced the crisis, but did not suffer a direct loss on financial assets. Thus, while a bail-in (of deposits or bonds) does trigger much stronger short-term changes in money-holdings, it seems that the experience of the banking crisis as such, rather than personal losses, are crucial to the long-term confidence in banks and household asset allocation. This is further confirmed by responses to a question on whether respondents have fears of renewed financial instability. The responses hardly differ between respondents who experienced a bail-in and respondents without any losses.

The lack of an observed relation between household exposure to the bail-in and depositor confidence or intended money holdings could be due to measurement error arising from the hypothetical nature of the underlying survey questions. However, in Appendix A8 we provide

evidence suggesting that this is not the case. There we show that our hypothetical measures of depositor confidence are consistent with our hypothetical measures of intended money holdings. Specifically, we relate the variables *Cash share*, *Deposit share*, *Deposit share=0*, and *Deposit share < 100k* to our measures of deposit confidence. The table shows that households with less trust in banks and the deposit insurance scheme would hold less of their assets in bank deposits and more in cash.

7. Conclusions

The bail-in of uninsured depositors and bond-holders is a cornerstone of recent proposals to reform the resolution process for systemically important banks. We provide novel evidence on how bank bail-ins in a crisis situation may affect household money holdings. We study the 2013 banking crisis in Cyprus. This crisis featured the first significant bail-in of depositors in the Eurosystem and was accompanied by capital controls limiting the access of all depositors to all bank accounts in Cyprus. We use unique household-level anonymized survey data focusing on depositors with significant savings deposits among which a large share experienced a bail-in.

We document a significant reallocation of money holdings from bank deposits to cash in the immediate aftermath of the crisis. The flight to cash is much stronger for households which experienced a bail-in than for households which experienced losses on bank equity, or no direct financial loss at all. Importantly, the impact of a bail-in on money holdings is equally strong, independent of whether households suffer a bail-in of deposits or bonds. We further document a significant reallocation of deposits between banks, with households more likely to transfer funds away from the resolved banks. While money holdings react strongly in the short-term to the experience of a bail-in, this is not the case for confidence in banks and household asset allocation nine months after the crisis. It seems that longer-term confidence in banks and money holdings is

largely determined by the experience of the crisis per se rather than by the personal experience of a bail-in.

What can we learn from the events in Cyprus for policy? The specific circumstances around the Cyprus crisis clearly warrant some caution in pushing conclusions too far. Nevertheless, we think that three lessons can be learnt for bank resolution: First, retail investors do not seem to distinguish between the bail-in of uninsured deposits and the bail-in of other (subordinated) debt. As the new bank resolution regime does prioritize uninsured deposits over other retail debt, it is important to clearly communicate this difference to retail investors. For example, disclosure rules for retail investment products should highlight different priorities of different debt claims on banks in a resolution process.

Second, the bail-in of retail investors undermines short-term confidence leading to significant outflows of deposits, especially from the affected banks. This suggests that there is a strong role for the lender of last resort to provide emergency liquidity during a bank resolution process.

Third, our findings suggest that current policies to limit the use of cash as a means of payment and wealth storage may seriously constrain the asset allocation of households. The case of Cyprus highlights that concerns about the safety and soundness of the banking system are very likely to result in a reallocation of money holdings towards cash. This finding is by no means new; Friedman and Schwartz (1963), for example, draw similar conclusions from the U.S. experience in the Great Depression. Moreover, in the aftermath of the 2007-2009 financial crisis, the demand for currency, be it internal or external, also increased in the US and the euro area (Jobst and Stix, 2017). Thus, while in normal times claims on banks may be viewed as an almost perfect substitute for cash, this is by no means the case during banking crises.

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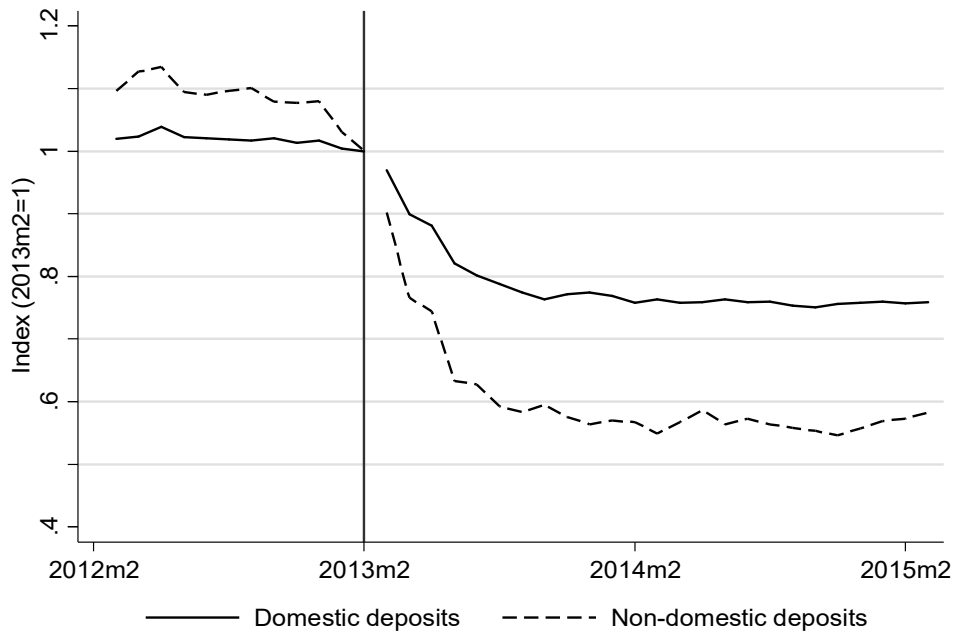
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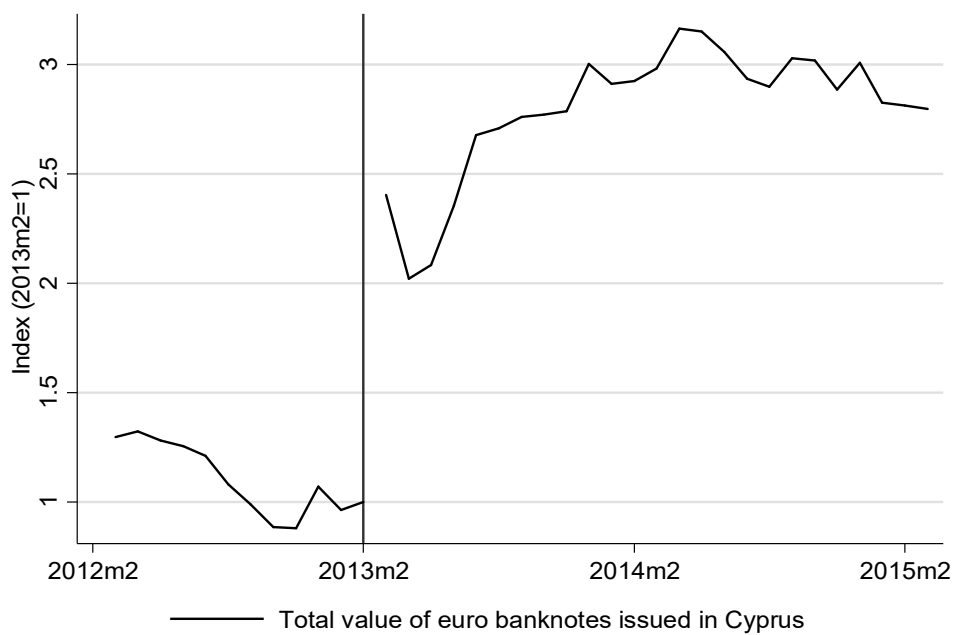
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Figure 1. Aggregate Bank Deposits and Cash Issuance

Panel A. Total customer deposits



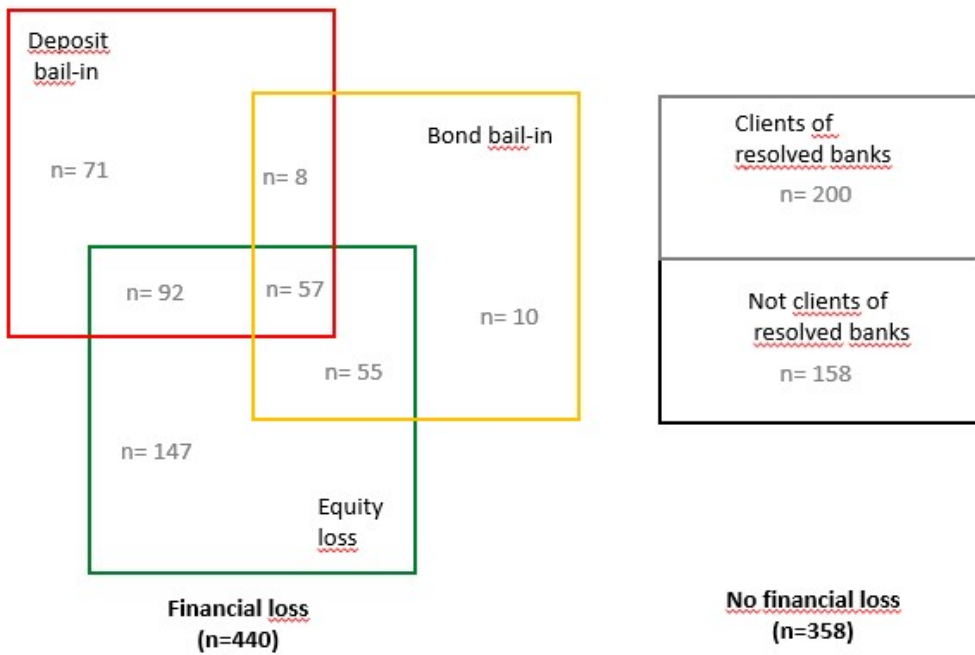
Panel B. Net value of banknotes issued in Cyprus



Note: Panel A shows total customer deposits of non-Monetary and Financial Institutions (MFIs) held with MFIs in Cyprus. Values are indexed at the month-end of February 2013. Brass-Blates, i.e. companies registered in Cyprus with no physical presence, are included in Domestic deposits. Source: Central Bank of Cyprus. Panel B shows the net value of euro banknotes issued in Cyprus (banknotes issued minus banknotes taken out of circulation). Values are indexed at the month-end of February 2013. All values refer to end of month values. The vertical bars denote month-end of February 2013. Source: Central Bank of Cyprus.

Figure 2. Household exposure to the crisis

Panel A. Frequency by type of financial loss and client status



Panel B. Classification of households by exposure

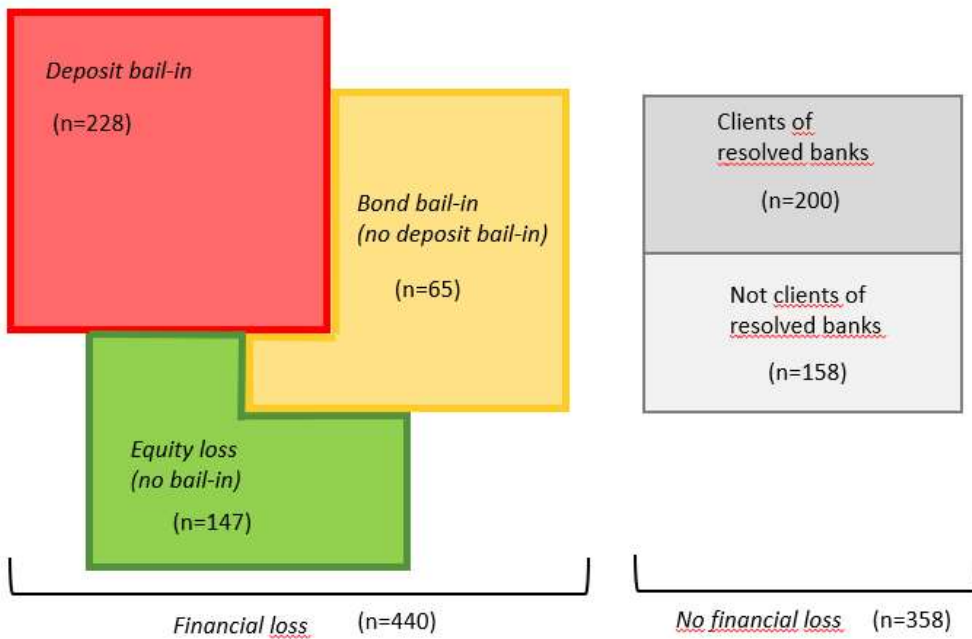


Figure 3. Network of bank accounts prior to the crisis

This figure shows the number of respondents that had pre-crisis deposit accounts with the two resolved banks (Bank of Cyprus, Cyprus Popular Bank), other commercial banks, and or cooperative credit institutions (CCI). The size of the boxes reflects the number of households which had a current account or term deposit at a particular group of financial institutions. The arrows connecting the boxes indicate the number of respondents that had pre-crisis accounts with both groups of financial institutions.

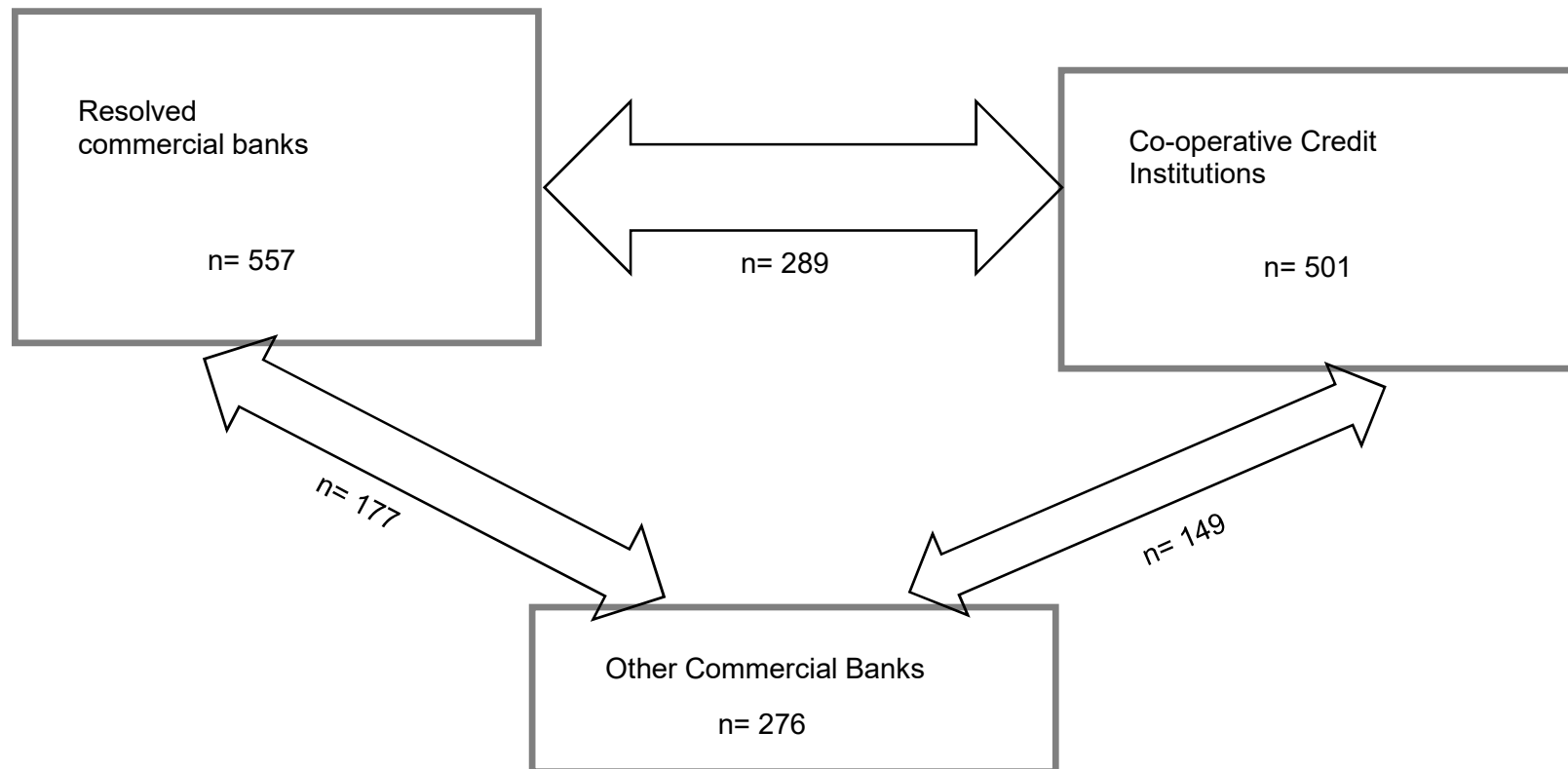


Table 1. Descriptive Statistics

The table shows sample means. All variables refer to the respondent (household), except *Transfer away* which refers to the respondent-bank level. The respective means are weighted and are representative for the respective population (see Appendix A4). Variable definitions are presented in Appendix Table A1.

	mean	sd	N	min	max
Losses due to bank resolution					
Deposit bail-in	0.17	0.37	806	0	1
Bond bail-in (but no deposit bail in)	0.08	0.27	806	0	1
Equity loss (but no bail in)	0.20	0.40	806	0	1
Changes money holdings					
Deposits decreased	0.52	0.50	789	0	1
Deposits decreased > 25%	0.21	0.41	778	0	1
More cash	0.21	0.41	786	0	1
<i>at respondent-bank level:</i>					
Transfer away	0.14	0.35	1038	0	1
Hypothetical asset allocation					
Share cash	0.11	0.24	807	0	1
Share deposits	0.40	0.37	807	0	1
Share deposit=0	0.34	0.47	807	0	1
Share deposit below 100k	0.78	0.42	807	0	1
Share transfer abroad	0.13	0.26	807	0	1
Share invest in Cyprus	0.36	0.36	807	0	1

Table 3. Reasons for deposit reduction

The table shows sample means for variables indicating the reasons for deposit reductions separated by whether a household incurred losses. The sample means are weighted and are representative for the respective population (see Appendix A4). P-value refers to a two-sided t-test of equal means. Variable definitions and summary statistics are presented in Appendix Tables A1-A3 and Table 1.

	Financial loss				p-value (n=384) (1) vs (4)	p-value (n=319) (2) vs (4)	p-value (n=191) (3) vs (4)
	Loss (n=254) (1)	Deposit / Bond Bail-in (n=189) (2)	Equity loss (no bail-in) (n=61) (3)	No loss (n=130) (4)			
Living expenses	0.47	0.42	0.59	0.78	0.00***	0.00***	0.01**
Pay loans	0.15	0.19	0.09	0.09	0.05**	0.01***	0.86
Cash hoarding	0.25	0.21	0.29	0.11	0.00***	0.02**	0.01***
Transfer abroad	0.07	0.10	0.02	0.00	0.00***	0.00***	0.28
Invest	0.04	0.07	0.01	0.02	0.14	0.03**	0.42
Other reason	0.01	0.02	0.00	0.00	0.11	0.07*	0.74

Table 5. Reallocation of term deposits across banks

The table shows results of a results of a linear probability model where the dependent variable is *Transfer away*. Observations are at the respondent-bank level. Columns 1-4 refers to all households with term deposit(s), Columns 5-7 to households with term deposits at more than one bank. Columns 3 and 6 include only households which experienced a bail-in of uninsured deposits or subordinated bonds. Columns 4 and 7 include only households which experienced no bail-in of uninsured deposits or subordinated bonds. Basic controls: *Loan, More than 1 bank relationship, Withdrawal before March 15, Uninsured deposits, Education high, Female, City, age* and region dummies. Extended controls: *Uninsured deposit, Real estate, Secondary residence, Financial literacy, Self employed, State employed*. Account-level controls: *Loan at same bank, Transaction account at same bank*. Variable definitions and summary statistics are presented in Appendix Tables A1-A3 and Table 1. All regressions are weighted. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Dependent variable	Transfer away				Transfer away		
Sample	Households with 1 or more term deposit accounts				Households with multiple term deposit accounts		
	All households	All households	Bail-in	No Bail-in	All households	Bail-in	No Bail-in
Term deposit at resolved bank	0.074** (0.030)	0.119*** (0.032)	0.152*** (0.052)	0.116*** (0.042)	0.106*** (0.037)	0.096** (0.043)	0.106* (0.059)
Basic controls	No	Yes	Yes	Yes	No	No	No
Extended controls	No	Yes	Yes	Yes	No	No	No
Account-level controls	No	Yes	Yes	Yes	Yes	Yes	Yes
Household FE	No	No	No	No	Yes	Yes	Yes
Observations	1038	942	458	476	577	312	194
Households	691	632	261	367	248	129	88
Mean of dependent variable	0.14	0.13	0.18	0.09	0.16	0.19	0.09
Method	OLS	OLS	OLS	OLS	FE Panel	FE Panel	FE Panel

Table 6. Hypothetical money holdings

The dependent variables in this table capture the hypothetical asset allocation of households which have 200'000 euro to allocate to cash, bank deposits, domestic investment or transfers abroad. In columns (1-2) the dependent variable is *Cash share*, and in columns (3-4) the dependent variable is *Deposit share*. In columns (5-6) the dependent variable is *Deposit share=0* which takes on the value one if the *intended deposit share* is zero, and zero otherwise. In columns (7-8) the dependent variable is *Deposit share<100k* which takes on the value one if intended deposits are below €100,000. Basic control variables: *Loan, More than 1 bank relationship, Withdrawal before March 15, Education high, Female, City, age* and region dummies. Extended control variables: *Uninsured deposit, Real estate, Secondary residence, Financial Literacy, Self-employed, State employee*. Results in columns (1-4) reflect average marginal effects from a FMLOGIT model, while column (5-8) results refer to linear probability models. Variable definitions and summary statistics are presented in Appendix Tables A1-A3 and Table 1. All regressions are weighted. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	<i>Cash share</i>		<i>Deposit share</i>		<i>Deposit share=0</i>		<i>Deposit share<100k</i>	
Range of dependent variable	from 0 to 1		from 0 to 1		0/1		0/1	
Equity loss	-0.005 (0.028)	0.005 (0.035)	0.056 (0.045)	-0.003 (0.047)	0.035 (0.056)	0.061 (0.064)	-0.112** (0.052)	-0.031 (0.055)
Bond bail-in	0.056 (0.038)	0.077* (0.041)	0.036 (0.056)	-0.001 (0.062)	-0.058 (0.075)	-0.005 (0.081)	-0.023 (0.068)	0.009 (0.079)
Deposit bail-in	0.004 (0.028)	0.015 (0.053)	0.006 (0.042)	0.025 (0.069)	0.000 (0.056)	-0.083 (0.091)	-0.013 (0.047)	0.017 (0.070)
Basic controls	No	Yes	No	Yes	No	Yes	No	Yes
Extended controls	No	Yes	No	Yes	No	Yes	No	Yes
Households	806	685	806	685	806	685	806	685
Mean of dependent variable	0.10	0.10	0.42	0.42	0.32	0.33	0.75	0.74
R-squared					0.00	0.07	0.01	0.06
Method	FMLOGIT	FMLOGIT	FMLOGIT	FMLOGIT	OLS	OLS	OLS	OLS

Table 7. Depositor confidence

The table shows the sample means of *Not safe insured*, *Not safe uninsured*, *Fear of fin. instability* and *Anger about bail-in* separated by the type of financial loss a household incurred as a result of the bank resolutions. The sample means are weighted and are representative for the respective population (see Appendix A4). P-value refers to a two-sided t-test of equal means. Variable definitions and summary statistics are presented in Appendix Tables A1-A3.

	Deposit bail-in	Bond bail-in	Equity loss	No Loss	p-value		
	(1)	(2)	(3)	(4)	(1) vs (4)	(2) vs (4)	(3) vs (4)
Not safe insured	0.33 (n=224)	0.35 (n=63)	0.18 (n=141)	0.29 (n=354)	0.27	0.35	0.01***
Not safe uninsured	0.82 (n=227)	0.71 (n=65)	0.62 (n=145)	0.71 (n=358)	0.00***	0.94	0.06*
Fear of fin. instability	0.74 (n=228)	0.76 (n=65)	0.64 (n=144)	0.73 (n=360)	0.87	0.58	0.06*
Anger about bail-in	0.76 (n=227)	0.74 (n=65)	0.72 (n=146)	0.62 (n=358)	0.00***	0.03**	0.02**

Appendix A1. Definition of main variables

Losses due to bank resolution		
Variable	Definition	Range
Deposit bail-in	Dummy variable=1 if depositor was bailed in, 0 otherwise. <i>Deposit bail-in, Bond bail-in, Equity loss</i> are mutually exclusive.	dummy variable
Bond bail-in (but no deposit bail-in)	Dummy variable=1 if depositor had no deposit loss but incurred a substantial loss in value (€5,000 or more) with capital securities of Bank of Caprus or Laiki Bank, 0 otherwise. <i>Deposit bail-in, Bond bail-in, Equity loss</i> are mutually exclusive.	dummy variable
Equity loss (but no bail in)	Dummy variable=1 if depositor had no deposit bail-in and no bond bail-in but incurred a substantial loss in value (€5,000 or more) with shares in Bank of Caprus or Laiki Bank, 0 otherwise. <i>Deposit bail-in, Bond bail-in, Equity loss</i> are mutually exclusive.	dummy variable

Change money holdings		
Variable	Definition	Range
Deposits decreased	Derived from "Compared to one year ago (January 2013), has the overall amount of your households' deposits with all banks / co-operatives within Cyprus decreased, remained the same or increased? Please disregard bailed in funds.". Dummy variable=1 if decreased, 0 otherwise.	dummy variable
Deposits decreased > 25%	Derived from "By about which percentage has the overall amount of your households' deposits with all banks / co-operatives within Cyprus decreased?". Dummy variable=1 if decrease was larger than 25%, 0 otherwise.	dummy variable
More cash	Dummy variable=1 if household holds more cash in March 2014 than in January 2013. Derived from "If you think about the total amount of money your household holds at banks and co-operatives and in cash, about which percentage do you currently hold as cash? [SHOWCARD: About one week's current expenses / About up to two net monthly salaries / About one fourth of your savings / About half of your savings / More than half of your savings / Not applicable (no cash)]". Same question was asked for situation 12 months ago (January 2013).	dummy variable
Transfer away	Dummy variable = 1 if household has transferred substantial amounts (€5,000 or more) from a term deposit account since January 2013, 0 otherwise. Based on a sequence of questions. First, respondents were asked at which banks they held term deposit accounts as of January 2013. Then they were asked whether they transferred substantial amounts. If yes, then they were asked for each bank at which they held a term deposit account whether they transferred from this bank.	dummy variable

Hypothetical asset allocation		
Variable	Definition	Range
Share cash, Share deposits, Share transfer abroad, Share invest in Cyprus	Based on "Suppose restrictive measures are completely abolished and you are free to choose how to invest €200,000 for saving purposes. What would you do? Please allocate amounts to the following option. (i) Deposit at one or several banks or co-operatives in Cyprus, (ii) transfer abroad (deposit, purchase property, shares, bonds), (iii) invest in Cyprus (e.g. purchase property, shares, bonds) in Cyprus, (iv) keep as cash in a safe deposit box or other safe place."	0-1
Deposit share=0	Dummy variable=1 if intended deposit share is zero, 0 otherwise.	dummy variable
Deposit share<100k	Dummy variable=1 if intended deposit share is below €100,000, 0 otherwise.	dummy variable

Appendix A2. Definition of control variables

Bank relationship		
Variable	Definition	Range
Client of resolved bank	Dummy variable=1 if depositor had a transaction account or term deposit account at the Bank of Cyprus (BoC) or the Laiki Bank (PoP) in March 2013	dummy variable
Term deposit at resolved bank	Dummy variable=1 if depositor had a term deposit account at the Bank of Cyprus (BoC) or the Laiki Bank (PoP) in March 2013	dummy variable
More than 1 bank relationship	Dummy variable=1 if respondent had a transaction account or a term deposit account at more than 1 bank in January 2013, 0 otherwise (BoC and PoP are treated as one bank).	dummy variable
Loan	Dummy variable if respondent had a loan as of January 2013, zero otherwise.	dummy variable
Withdrawal before bail-in	Derived from "Did your household withdraw or transfer money between banks before 15 March 2013 (1st January-14 March 2013) or after 15 March 2013? Please refer only to substantial shifts (€5000 or more)." Dummy variable=1 if household withdrew before March 15, 0 otherwise.	dummy variable

Depositor confidence		
Variable	Definition	Range
Not safe uninsured	Derived from "Currently, do you consider safe, depositing €200,000, under one name, at ... ". This question was asked for five (groups of) banks. Dummy variable=1 if households answers at least once that it is not safe, 0 otherwise.	dummy variable
Not safe insured	Derived from "Currently, would you say that depositing €50,000 at any bank or co-operative in Cyprus is safe?". Dummy variable=1 if no 0 if yes.	dummy variable
Fear of fin. instability	Derived from "In your decision on how to hold your savings, are you influenced by fear about renewed financial instability in Cyprus". Dummy variable=1 if no 0 if yes.	dummy variable
Anger about bail-in	Derived from "In your decision on how to hold your savings, are you influenced by continued anger about the bail in". Dummy variable=1 if no 0 if yes.	dummy variable

Socio-demographic information		
Variable	Definition	Range
Age	Age in categories	1-6
Education high	Dummy variable=1 if post graduate studies (master's degree) or doctoral degree, 0 otherwise.	dummy variable
City	Dummy variable=1 if more than 7,000 inhabitants, 0 otherwise.	dummy variable
Uninsured deposit	Dummy variable=1 if total deposited amount was larger than €100,000 at March 2013, zero otherwise. Source of information: For banks from register data. For Cooperative credit institutions constructed from survey responses and register data.	dummy variable
Financial Literacy	Derived from "Suppose you have deposited €100 at a deposit account and the interest rate is 4% per year. If the inflation rate is 5%, after 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in their account?". Dummy variable=1 if "less", 0 if "more", "exactly the same" or "don't know".	dummy variable
Self-employed	Dummy variable=1 if "self-employed, no employees", "owner of a company, employees", 0 otherwise.	dummy variable
State employee	Dummy variable=1 if "employee - broader public sector", 0 otherwise.	dummy variable
Real estate, Secondary residence	Dummy variables=1 if respondents owns primary (secondary) residence, 0 otherwise.	dummy variable

Reasons for deposit reduction		
Variable	Definition	Range
Living expenses, Pay loans, Cash hoarding, Transfer abroad, Invest, Other reason	Based on " What were the main reasons why the amount of your households' overall deposits with all banks / co-operatives within Cyprus decreased?" We decided to... (i) withdraw money and keep it as cash in Cyprus, (ii) transfer money abroad, (iii) pay off loan(s), (iv) invest in Cyprus (e.g. property, shares, bonds), (v) use the money for covering living expenses, (vi) other". Up to two answers were possible. For defining the variables, we used the first reason. E.g. <i>Living expenses</i> = 1 if first reason was answer (v), 0 otherwise.	dummy variables

Variables at the respondent-bank level		
Variable	Definition	Range
Term deposit at resolved bank	Dummy variable=1 if the household has term deposit at Bank of Cyprus or Cyprus Popular Bank, 0 otherwise.	dummy variables
Loan at same bank	Dummy variable=1 if the household has a loan and a term deposit at a bank, 0 otherwise.	dummy variables
Transaction account at same bank	Dummy variable=1 if the household has a loan and a term deposit at a bank, 0 otherwise.	dummy variables

Appendix A3. Descriptive statistics

Bank relationship	N	mean	sd	min	max
Client of resolved bank	805	0.69	0.46	0	1
Term deposit at resolved bank	806	0.43	0.50	0	1
More than 1 bank relationship	807	0.51	0.50	0	1
Loan	807	0.58	0.49	0	1
Withdrawal before bail-in	802	0.13	0.33	0	1
Depositor confidence	N	mean	sd	min	max
Not safe uninsured	802	0.71	0.45	0	1
Not safe insured	789	0.28	0.45	0	1
Fear of fin. instability	804	0.72	0.45	0	1
Anger about bail-in	803	0.67	0.47	0	1
Socio-economic information	N	mean	sd	min	max
Age	803	3.72	1.27	1	6
Education high	806	0.17	0.37	0	1
City	806	0.82	0.38	0	1
Uninsured deposit	706	0.26	0.44	0	1
Financial literacy	807	0.80	0.40	0	1
Self-employed/owner	803	0.11	0.31	0	1
Public sector employee	803	0.16	0.36	0	1
Real estate	807	0.87	0.33	0	1
Secondary residence	806	0.56	0.50	0	1
Reasons for deposit reduction	N	mean	sd	min	max
Living expenses	391	0.61	0.49	0	1
Pay loans	391	0.12	0.33	0	1
Cash hoarding	391	0.18	0.39	0	1
Transfer abroad	391	0.04	0.19	0	1
Invest in Cyprus	391	0.03	0.18	0	1
Respondent-bank level variables	N	mean	sd	min	max
Term deposit at resolved bank	1038	0.40	0.49	0	1
Loan at same bank	1038	0.32	0.47	0	1
Transaction account at same bank	1038	0.81	0.39	0	1

Appendix A4. Representativeness of sample

The table compares summary statistics from the survey sample with external information.

	Survey sample		Population / Other evidence mean	Source of population data or other evidence and remarks
	unweighted mean	weighted mean		
Ownership of a term deposit	1	1	0.81	ECB HFCS, Table C1, 2011
Households with a loan	0.56	0.58	0.65	ECB HFCS, Table E1, 2011
Ownership of main residence	0.88	0.87	0.77	ECB HFCS, Table B1, 2011
Ownership of secondary residence	0.61	0.56	0.52	ECB HFCS, Table B1 ("Has other real estate property"), 2011
Education at most primary	0.04	0.05	0.05	Statistical Service, Highest educational attainment level for persons aged 20 and over, 2013
Education tertiary	0.53	0.48	0.34	Statistical Service, Highest educational attainment level for persons aged 20 and over, 2013
Unemployment rate	0.09	0.08	0.14	Statistical Service, Labour Force Survey, unemployment rate of those 25-65, Q4/2013
Female	0.39	0.38	0.52	Statistical Service, share among population aged 20+, 2013
HH size	3.07	3.08	2.76	Statistical Service, Census 2011
Non-Greek mother tongue	0.02	0.02	0.22	Statistical Service, Census 2011
Nikosia	0.59	0.58	0.39	Statistical Service, Census 2011
Limassol	0.26	0.27	0.28	Statistical Service, Census 2011
Paphos	0.06	0.06	0.11	Statistical Service, Census 2011
Larnaca	0.08	0.09	0.17	Statistical Service, Census 2011

Sources: 1) Statistical Service of the Republic of Cyprus, various data sources downloaded from webpage (accessed April 14, 2015). 2) ECB, "The Eurosystem Household Finance and Consumption Survey, Statistical Tables", April 2013,

http://www.ecb.europa.eu/home/pdf/research/HFCS_Statistical_Tables_Wave1.pdf?93617b19d03b9491c9e7adde682e7688, accessed April 14, 2015.

Appendix A5. Sample means of confounding variables by type of loss

The table shows the sample means of *confounding variables* separated by type of financial loss. The sample means are weighted and are representative for the respective population (see Appendix 1). P-value refers to a two-sided t-test of equal means. The number of observations vary slightly for individual variables (col 1 ~292 obs, col 2 ~146 obs, col 3 ~359 obs). Variable definitions and summary statistics are presented in Appendix Tables A1-A3.

	Deposit bail-in	Bond bail-in	Equity loss	No Loss	p-value		
	(1)	(2)	(3)	(4)	(1) vs (4)	(2) vs (4)	(3) vs (4)
Loan	0.50	0.61	0.58	0.61	0.01***	0.89	0.49
More than 1 bank relationship	0.60	0.56	0.60	0.45	0.00***	0.12	0.00***
Withdrawal before March 15	0.21	0.15	0.14	0.09	0.00***	0.25	0.12
Age 2	0.09	0.17	0.10	0.16	0.01**	0.92	0.03**
Age 3	0.27	0.26	0.29	0.26	0.74	0.98	0.46
Age 4	0.28	0.25	0.20	0.24	0.30	0.96	0.27
Age 5	0.27	0.21	0.34	0.23	0.23	0.79	0.02**
Age 6	0.06	0.09	0.07	0.06	0.93	0.42	0.67
Education high	0.21	0.24	0.17	0.14	0.03**	0.09*	0.44
Female	0.40	0.40	0.28	0.43	0.43	0.66	0.00***
Larnaca - Famagusta	0.13	0.06	0.10	0.09	0.13	0.32	0.78
Limassol	0.20	0.31	0.25	0.31	0.00***	0.99	0.18
Paphos	0.05	0.06	0.04	0.07	0.26	0.63	0.09*
City	0.79	0.84	0.84	0.82	0.38	0.76	0.69
Uninsured deposit	1.00	0.08	0.09	0.07	0.00***	0.72	0.36
Financial literacy	0.87	0.87	0.90	0.74	0.00***	0.01***	0.00***
Self-employed/owner	0.09	0.10	0.17	0.10	0.64	0.96	0.03**
State employee	0.10	0.14	0.16	0.18	0.01***	0.44	0.64
Real estate	0.81	0.94	0.90	0.87	0.08*	0.03**	0.39
Secondary residence	0.67	0.74	0.62	0.47	0.00***	0.00***	0.00***

Appendix A8. Hypothetical money holdings and depositor confidence

The dependent variables in this table capture the hypothetical asset allocation of households which have 200'000 euro to allocate to cash, bank deposits, domestic investment or transfers abroad. In columns (1-2) the dependent variable is *Cash share*, and in columns (3-4) the dependent variable is *Deposit share*. In columns (5-6) the dependent variable is *Deposit share=0* which takes on the value one if the intended deposit share is zero, and zero otherwise. In columns (7-8) the dependent variable is *Deposit share<100k* which takes on the value one if intended deposits are below €100,000. Basic control variables: *Loan, More than 1 bank relationship, Withdrawal before March 15, Education high, Female, City*, age and region dummies. Extended control variables: *Uninsured deposits, Real estate, Secondary residence, Financial Literacy, Self-employed, State employee*. Results in columns (1-4) reflect average marginal effects from a FMLOGIT model, while column (5-8) results refer to linear probability models. Variable definitions and summary statistics are presented in Appendix Tables A1-A3. All regressions are weighted. Robust standard errors are reported in parentheses. ***, **, * denote significance at the 0.01, 0.05 and 0.10-level.

Column	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variable	<i>Cash share</i>		<i>Deposit share</i>		<i>Deposit share=0</i>		<i>Deposit share<100K</i>	
Range of dependent variable	from 0 to 1		from 0 to 1		0/1		0/1	
Not safe insured	0.096*** (0.021)	0.087*** (0.024)	-0.155*** (0.036)	-0.089** (0.038)	0.226*** (0.048)	0.143*** (0.052)	0.088** (0.038)	0.042 (0.041)
Not safe uninsured	0.001 (0.022)	0.016 (0.026)	-0.075** (0.036)	-0.081** (0.040)	0.05 (0.045)	0.05 (0.052)	0.109** (0.044)	0.133*** (0.050)
Basic controls	No	Yes	No	Yes	No	Yes	No	Yes
Extended controls	No	Yes	No	Yes	No	Yes	No	Yes
Households	785	668	785	668	785	668	785	668
Mean of dependent variable	0.09	0.09	0.42	0.42	0.32	0.33	0.75	0.74
R-squared					0.05	0.09	0.02	0.08
Method	FMLOGIT	FMLOGIT	FMLOGIT	FMLOGIT	OLS	OLS	OLS	OLS

Appendix A9. Timeline of “Restrictive measures”

Restrictive measures were imposed in a series of decrees. The following list is a compilation of restrictive measures as well as major regulatory changes that were most relevant for **domestic retail clients** (Source: Central Bank of Cyprus and various other sources). The list is not exhaustive.

Restrictive measures were imposed on 27 March 2013 and fully abolished on 6 April 2015.

Limits on cash withdrawals:

27 March 2013: €300 daily per person (natural or legal) in each credit institution; cashing of cheques prohibited.

25 April 2013: legal persons allowed to withdraw €500 daily from each credit institution.

31 March 2014: restrictions on cash withdrawals removed.

5 May 2014: prohibition of the cashing of cheques removed.

Limits on cash export:

27 March 2013: €1.000 per person, per journey.

11 April 2013: €2.000.

25 April 2013: €3.000.

8 December 2014: €6.000.

12 January 2015: €10.000.

6 April 2015: restrictions removed.

Limit on non-cash payments or transfers from a credit institution to another credit institution in Cyprus:

27 March 2013: €5.000 per day and per account for transactions falling within the normal business activities of the customer, with greater amounts being subject to the approval of a Committee; payments of salaries and tuition fees were not subject to limits or Committee approval (only documentation requirements).

2 April 2013: allowing payments through cheques by natural persons to other credit institutions in Cyprus up to a limit (€9.000 per month), increasing the amount that may be paid or transferred, without authorization (i.e. Committee approval) requirements, to other credit institutions in Cyprus for normal business activities, from €5.000 to €25.000 per day per account.

11 April 2013: increase of limit to €300.000 per transaction for normal business activities.

25 April 2013: no limit on payments for purchase of goods or services (only documentation requirements); otherwise €10.000 per month per natural person regardless of purpose and €50.000 per month per legal person.

17 May 2013: €15.000 per month per natural person regardless of purpose and €75.000 per month per legal persons.

24 February 2014: €20.000 per month per natural person regardless of purpose and €100.000 per month per legal person.

31 March 2014: €50.000 per month per natural person regardless of purpose and €200.000 per month per legal person.

5 May 2014: restrictions removed (except for transfers to accounts of international customers of foreign banks operating in Cyprus, which were treated as accounts abroad).

Non-cash payments or transfers abroad:

- 27 March 2013: €5.000 per day and per account for transactions falling within the normal business activities of the customer; payments of salaries and tuition fees were not subject to limits or Committee approval (only documentation requirements); payments via credit, debit or prepaid cards up to €5.000 per month.
- 11 April 2013: €20.000 per day and per account for normal business activities; no limit on transfers for medical expenses.
- 14 April 2013: Transfers abroad up to €2.000 per month per person from each credit institution for any purpose (without supporting documents) were allowed (in addition to normal business transactions).
- 20 April 2013: €20.000 per transaction for normal business activities.
- 25 April 2013: €500.000 per transaction for normal business activities; limit on card payments removed.
- 25 April 2013: €5.000 per month per person, from each credit institution, for any purpose (in addition to normal business transactions); this limit was gradually raised as follows:
 - 8 December 2014: €10.000
 - 12 January 2015: €20.000.
 - 16 February 2015: €50.000.
 - 16 March 2015: €1.000.000.

The limits on payments for normal business activities were gradually raised from €500.000 per transaction (as of 25 April 2013) to €1.000.000 on 25 October 2013 and to €2.000.000 on 8 December 2014. This limit was removed on 12 January 2015.

Fixed term deposits:

- 27 March 2013: prohibition of termination of fixed term deposits, with certain exceptions (primarily repayment of loan by the same credit institution), limit on the amount that may be transferred to a sight account from a fixed term deposit on maturity (€5.000 or 10% of total amount, whichever is higher).
- 29 March 2013: allowing the transfer of €300 daily per person from a notice account to a current account.
- 11 April 2013: limit on the amount that may be transferred to a sight account from a fixed term deposit on maturity raised to 20% of total amount.
- 14 April 2013: authorization requirements for the termination of fixed term deposits were removed for amounts up to €5.000 monthly for humanitarian reasons.
- 7 June 2013: removal of authorization requirements for the termination of fixed term deposits for the payment of any medical expenses.
- 31 March 2014: restrictions removed.

Addition of beneficiaries to existing fixed term deposits:

2 April 2013: addition of beneficiaries to existing fixed term deposits allowed.

Opening of new accounts:

11 April 2013: the opening of a new bank account for a person who, as of 11 April 2013, was not a customer of the credit institution was prohibited, unless the account would only be credited with funds transferred from abroad, or the prior approval of the Committee was obtained.

2 August 2013: credit institutions were allowed to accept cash exceeding €5.000 in new fixed-term deposit accounts for persons who were not previously their customers; credit institutions were also allowed to open new accounts related to new loans granted.

2 June 2014: restrictions removed.

International customers of foreign banks operating in Cyprus:

25 April 2013: transactions of non-resident customers of foreign banks were in principle exempted from the restrictive measures provided certain conditions were met (accounts must not have been credited with funds from domestic customers or domestic banks, parent banks must confirm that they would support the liquidity position of the subsidiary or branch in Cyprus, etc.).

10 May 2013: Four foreign banks (branches and subsidiaries) became eligible for the above exemption. The list of eligible foreign banks was subsequently enlarged to include 16 foreign banks (as from 7 June 2013).