Bank ownership type and temporal evolution of long-term bank funding in the period 2005-2017

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Abstract

This study uses a large panel dataset of Western European banks to examine the determinants of bank funding stability. Banks are divided into three categories by bank ownership type; the ownership types in this study are commercial banks, cooperative banks and savings banks. Three sources of stable bank funding are investigated: customer deposits, equity and long-term liabilities. Furthermore, the sum of these funding components is used as a proxy variable for a bank's total available stable funding (ASF). A special focus is on the temporal evolution of these funding types. The regression results show that commercial banks' funding became much more stable from 2005–2017. However, that funding remains, on average, less stable than does cooperative and savings banks' funding. In addition, funding stability has remained at the pre-crisis level in cooperative and savings banks, even though there is a steep dip in cooperative banks' ASF during the sovereign debt crisis. Furthermore, banks substantially decreased financing from long-term liabilities after the financial crisis. They have replaced them with customer deposits and equity.

Keywords: banks, bank funding, financial stability, bank ownership type
JEL classification: G01, G21, G32

1. Introduction

1.1. Introduction

In August 2007, liquidity in the euro area money market fell short because banks that had liquidity balances tended to hoard them instead of distributing them to banks that were short of liquidity[1]. ECB (2013) suggests that after the drying up of interbank markets, banks aimed to reduce their reliance on volatile interbank funding by increasing the use of more stable funding. As a result, banks in the euro area experienced a general shift away from wholesale funding over the 2008–2015 period (ECB, 2016). ECB (2016) argues that this shift indicates a trend towards a more traditional banking business model for the euro area. Resulting from this trend, the median customer deposits-to-total liabilities ratio in the euro area banks increased from 28% to 45% over the 2008–2015 period. In the meantime, the median share of wholesale funding in liabilities fell to 23% from 32% over the same period.

This study uses a large panel of Western European banks to examine bank funding types. In particular, this study investigates long-term bank funding: customer deposits, long-term liabilities and equity. Moreover, this study examines the stability of Western European bank funding structures by explaining a variable capturing a bank's total available stable funding (ASF). It is proxied as the sum of the three long-term funding components. Motivated by the documented shift in bank funding composition, a special focus is on the temporal evolution of different long-term funding types before, during and after the financial and sovereign debt crises. Our main objective is to shed light on the transformation in funding structures in the Western European banking sector.

In addition, banks are divided according to their ownership structures. The bank ownership types in this study are commercial banks, cooperative banks and savings banks. Incorporating bank ownership type into this study is motivated by Groeneveld (2014), who suggested that cooperative banks have business models that focus on retail banking. Similarly, Ayadi et al. (2009) suggested that savings banks have a traditional and retail-funded business model. Therefore, stakeholder

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[1]ECB (2007) argues that several factors contributed to the liquidity crunch; first, banks that knew they were exposed to US sub-prime-related assets began to build precautionary balances, thus anticipating their potential funding liquidity needs. Second, liquidity-providing banks were not able to distinguish between credit institutions that were exposed to sub-prime-related assets and those that were not. Third, money market funds built up precautionary liquid balances to cover the risk of potential redemption requests by investors. Liquidity hoarding made obtaining interbank funding difficult.

banks are included in this study because of their different business models; it is assumed that stakeholder banks are more customer-deposit-oriented in their funding than are commercial banks. Since customer deposits are the largest source of stable funding, their funding profiles should be more stable than those of commercial banks. For the same reason, they are assumed to have been less obliged to alter their funding structures after the interbank credit crunch at the beginning of the financial crisis. To the best of our knowledge, this study is the first to examine the role of shareholder/stakeholder ownership in bank funding structures. Furthermore, there is no study that examines the temporal evolution of funding stability from 2005–2017. Therefore, this study fills significant gaps in the literature.

The study period is from 2005–2017. Consequently, the sample period includes several factors that might affect bank funding choices. First, the financial crisis began in 2007 as turmoil in the money markets, giving banks incentives to commence the shift away from wholesale funding towards more stable and reliable funding sources. Second, Basel III introduced the net stable funding ratio (NSFR) from 2009 (BIS, 2009). The ratio categorizes bank liabilities according to their perceived stability. For instance, equity, customer deposits and long-term liabilities are considered stable sources of funding. Consequently, stable, long-term funding components are given a higher weight when calculating the ASF. Since the NSFR is one of the two new requirements regulating bank liquidity, it further enhances banks' incentives to acquire stable funding.

Thus, even if we assume that stakeholder banks have a greater number of stable funding profiles than do commercial banks, we also assume that commercial banks' funding has become more stable over the 2005–2017 period because of (a) the general shift away from unstable wholesale funding ignited by the financial crisis and (b) the new regulation. However, it remains ambiguous whether commercial banks' funding stability is still lower than that of stakeholder banks at the end of the 2005–2017 period. Similarly, we have no strong assumption for the development of stakeholder banks' funding stability. Furthermore, we do not have any firm expectations for progress in the use of long-term liabilities; on the one hand, the NSFR gives them a higher weight in the ASF. On the other hand, issuing long-term bonds was handicapped by turmoil during the financial crisis (as suggested by ECB, 2013).

Currently, the literature on bank funding structures is relatively sparse. Until now, the literature has lacked a study that examines the role of bank ownership type in funding stability. Therefore, this study contributes to the literature on stakeholder ownership. For instance, this study contributes to studies such as Fonteyne (2007) and Groeneveld (2014). Similarly, this study is the

first to investigate the temporal evolution of stable funding over the 2005–2017 period. Hence, this study contributes to the literature by examining the development of the funding structures of Western European banks. Therefore, this study contributes to studies such as Gropp and Heider (2010) and King (2013).

The results suggest that stakeholder banks have, on average, more stable funding structures than do commercial banks. Nonetheless, commercial banks' funding has become significantly more stable after the sovereign debt crisis. In addition, cooperative banks experienced a dip in their funding stability during the sovereign debt crisis. This dip was caused by a simultaneous decrease in all three long-term funding types. As a result, their ASF is not, on average, higher than that of commercial banks from 2012–2013.

Further, all three bank ownership types substantially reduced their use of long-term liabilities in their funding. Moreover, commercial banks and savings banks were able to replace decreasing long-term liabilities by customer deposits. Therefore, their ASFs did not, on average, decrease during the crisis years. Eventually, cooperative banks also reached the pre-crisis level in funding stability by increasing funding from customer deposits and equity. Furthermore, large banks use less customer deposit funding than do smaller banks. Despite using more funding from long-term liabilities than their smaller counterparts, large banks' ASFs are, on average, lower than those of smaller banks. Similarly, fast-growing banks have lower ASFs than do banks that grow slowly.

The remainder of this paper is structured as follows: after the introduction, a literature review is provided, followed by an overview of the dataset and descriptive statistics. The econometric specifications are then presented, followed by the regression results. Finally, we present a discussion and provide conclusions.

1.2. Literature review

This study divides banks into stakeholder and shareholder banks. Furthermore, stakeholder banks are divided into cooperative and savings banks. Unlike commercial banks, stakeholder banks are not owned by shareholders. Profit maximization is neither the primary nor the exclusive aim of cooperative and savings banks because they maximize stakeholder value rather than shareholder value. Therefore, instead of maximizing profit, they maximize stakeholder value for a larger and more diversified group of subjects that represent diverse interests (Ayadi et al., 2010).

The members of cooperative banks share ownership by a one member-one share rule. Similarly, in cooperative banks, power is divided equally among members. Savings banks are further divided into private savings banks and publicly owned savings banks. They are either nonprofit organizations (foundations) or are owned by the government. Cooperative banks and savings banks have large market shares in certain Western European countries; together, the market share of stakeholder banks in Western Europe is approximately 20–25% of total assets.

Stakeholder banks are included in this study because it is assumed that different bank ownership types lead to different funding profiles. Groeneveld (2014) suggested that cooperative banks have business models that focus on retail banking. Fonteyne (2007) argues that extensive branch networks give cooperative banks strong retail market positions. Combined with loyal customers, large branch networks and strength in retail markets typically result in high levels of liquidity, high deposit-to-loan ratios and a tendency to be an interbank net lender (Fonteyne, 2007). Fonteyne (2007) argues that cooperative banks' ability to mobilize and retain deposits is their key strength. Similarly to cooperative banks, Ayadi et al. (2009) suggested that savings banks have a traditional business model that is dominated by retail funding. Accordingly, we expect that cooperative banks and savings banks are more oriented toward customer deposit funding than are commercial banks. Ayadi et al. (2009) argue that such a business model is less prone to the systemic instability problems that arose during the financial crisis.

Ayadi et al. (2010) argued that cooperative banks are often part of a network that has an integrated structure. Banks in a network cooperate both vertically and horizontally, and they have centralized services, such as product development. Furthermore, cooperative banks can have centralized liquidity management services. Fonteyne (2007) suggested that a vast majority of European cooperative banks are organized in networks, although the degree of networking varies from country to country. Therefore, the new regulation will treat banks somewhat differently according to their ownership type (BIS, 2014). Regulation allows cooperative banks to treat interbank deposits from other group members as stable liabilities similar to customer deposits.

With the exception of bank capital, there have been relatively few studies of bank funding structures. DeYoung and Jang (2016) showed that large banks use less customer deposit funding than do smaller banks. Moreover, Demirgüç-Kunt and Huizinga (2010) argued that large and rapidly growing banks place more emphasis on wholesale funding. Likewise, Feldman and Schmidt (2001) suggested that large banks use less funding from core deposits than do smaller banks. De Haan and van den End (2013) argued that the level of retail deposits in Dutch banks was stable from 2004 to 2008 and even increased from 2009 to 2010. Moreover, these authors

suggested that banks reduce lending, especially wholesale lending, in cases of negative funding shock.

Gropp and Heider (2010) suggested that large banks had lower equity ratios (i.e., more leverage) than small banks did over the 1991–2004 period. In addition, these authors suggested that banks had financed balance sheet growth from nondeposit liabilities from 1991 to 2004. The share of equity remained almost unchanged during this period. Similarly, Brewer III, Kaufman and Wall (2008) used a sample of banks from 12 industrialized countries over the 1992–2005 period to show that large banks have lower equity ratios than do smaller banks. Moreover, profitable banks have higher equity ratios.

Furthermore, one branch of literature studies the role of short-term finance in financial stability. For instance, López-Espinosa et al. (2012) show that short-term wholesale funding is the most relevant systemic risk factor using data from 18 countries over the 2001–2009 period. These authors argue that this finding supports the introduction of the NSFR because it prevents excessive exposure to liquidity risk. Similarly, López-Espinosa et al. (2013) argue that obtaining funding through unstable sources increases both individual insolvency risk and the risk of spillover into the financial system.

Liquidity hoarding is well documented in the literature. For instance, using data on U.K. banks, Acharya and Merrouche (2012) show that wholesale funding markets, especially markets for asset-backed commercial papers, froze in August 2007. This event was followed by a period during which interbank lending and borrowing was adversely affected. De Haan and van den End (2013) use data on 17 Dutch banks from 2004–2010 to show that the liquidity hoarding motive dominates the fire sale motive when the central bank supplies additional liquidity during a crisis. Acharya and Skeie (2011) provide an explanation for the rise in interbank spreads and the collapse in maturities during financial crises. These authors show that a bank's willingness to provide term lending is determined by the bank's own rollover risk. Consequently, banks hoard liquidity by lending less and setting higher interest rates at longer maturities during financial crises when rollover risk is pronounced. For borrowing banks, this behavior aggravates the debt overhang and rollover risk problems.

Dependence on wholesale funding affected bank behavior during the financial crisis. For instance, using data on Portuguese banks from 2007–2009, Iyer, Peydró, da-Rocha-Lopes and Schoar (2013) show that banks that relied more on interbank funding contracted lending more during the financial crisis[2]. Moreover, Ritz and Walther (2015) propose a theoretical model to

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[2]For similar results, see, e.g., Kapan and Minoui (2014) and Dagher and Kazimov (2015).

show that increased funding uncertainty leads to contracting lending volumes, profitability and balance sheet. In contrast, increased competition in deposit markets benefits savers due to higher deposit interest rates. However, such higher rates may lead to deposits being attracted at a loss because the deposit rate may exceed a bank's own wholesale funding cost.

2. Data and econometric specifications

2.1. Data

Bank-specific variables are drawn from Bankscope, a commonly used database in banking studies. The database is maintained by Bureau Van Dijk and consists of bank income statement and balance sheet data. The study period is 2005–2017. The dataset is only consolidated; hence, it concerns banks at the group level. This source was chosen because banks manage funding at the group level. Therefore, using bank-level unconsolidated data could yield misguiding results.

The dataset includes 18 Western European countries (see Table 1) – the EU15 and the Western European countries that are not part of the European Union or the Economic and Monetary Union: Norway, Iceland and Switzerland. To improve the quality of the data, the dataset was reviewed to remove any overlapping bank ownership structures. For example, several subsidiary banks had their own entries despite their parent companies being included in the dataset. After these corrections, the dataset contained no overlapping ownership structures.

Table 1 shows that there are only seven publicly owned savings banks in the sample. Therefore, publicly owned savings banks are not studied separately in this study. They are examined together with private savings banks; i.e., there is only one category for both types of savings banks. This strategy is different from, e.g., that of Meriläinen (2016). However, since it is possible that private savings banks and publicly owned savings banks have different funding profiles, all the regressions are run with a sample that excludes publicly owned savings banks and thereby examines only private savings banks. This procedure has no effect on the regression results. Moreover, excluding publicly owned savings banks does not affect descriptive statistics.

TABLE 1 HERE

The data were included in this study in such a way that bank parent companies were preferred to bank group members. This decision was made because some cooperative banking groups use interbank funding from other group members to manage their liquidity. Cooperative banks are allowed, at the discretion of national supervisors, to include weight factors of up to 85% for interbank deposits within the same cooperative network in the NSFR calculation. Because these interbank liabilities come from other group members, using data that concern group parent companies prevents interbank deposits from other group members from being misinterpreted as unstable liabilities in the case of cooperative banks. Therefore, using data on group members could produce misleading results because these banks can access interbank funding from other group members.

The dataset made more balanced by including only banks that have at least two observations for the measure of long-term liabilities. The frequency of observations is scarcer for this variable than it is for other variables. Therefore, the dataset made more balanced to ensure that it includes the same banks in all regressions and descriptive statistics. In total, the dataset includes 373 banks. Finally, the GDP growth variable is obtained from the OECD. The variables used in this study are defined in Table 2.

TABLE 2 HERE

Customer deposits are the largest source of stable funds. Moreover, similar to equity, liabilities that have a residual maturity of at least one year have a 100% weight in the calculation of the NSFR. Together, these three variables account for, on average, greater than 75% of bank funding and for a majority of stable funding. Thus, we use these three variables to examine the determinants of bank funding stability. Customer deposits, equity and long-term liabilities are totaled to calculate a proxy for the stability of the bank funding profile. The more bank funding that comes from these sources, the better; according to the NSFR, these liabilities provide a stable funding profile. Similarly, if less funding comes from these sources, the share of funding from more unstable sources, such as interbank deposits, increases.

2.2. Econometric specifications

The econometric model (Equation 1) is an ordinary least squares (OLS) regression with fixed bank effects. Furthermore, the regression is repeated with different explained variables: (1) the customer deposit-to-total asset ratio; (2) the long-term liabilities-to-total assets ratio; (iii) the equity ratio; and (4) the sum of these three variables, which is a proxy for the stability of the bank funding profile. The main dependent variable of interest is the proxy variable for a bank's total stable funding. Nonetheless, the funding components are also examined separately. Moreover, these regressions are run separately for each bank ownership type.

$$\frac{Y_{it}}{Total\ assets_{it}} = \alpha_i + \beta_1 \log(total\ assets)_{i(t-1)} + \beta_2 \Delta \log(total\ assets)_{it} + \beta_3 \frac{Equity_{i(t-1)}}{Total\ assets_{i(t-1)}}$$
$$+ \beta_4 \frac{Net\ loans_{i(t-1)}}{Total\ assets_{i(t-1)}} + \beta_5 \frac{Profit_{i(t-1)}}{Total\ assets_{i(t-1)}} + \beta_6 GDP\ growth_{it} + \sum D_{Year} + \varepsilon_{it}$$

The specifications test several hypotheses concerning funding structure choices. Furthermore, several variables control for factors that are likely to affect bank funding. First, as Demirgük-Kunt and Huizinga (2010) suggested, rapidly growing banks could have different funding strategies than those of banks that grow slowly. These authors showed that fast-growing banks are relatively heavily financed through nondeposit funding. Similarly, DeYoung and Jang (2016) argued that fast asset expansion is difficult to match with new core deposit funding. Consequently, the expectation for this variable is generally negative. However, the expectation for long-term liabilities is ambiguous because banks might fund fast growth using long-term liabilities. Asset growth is measured as the first difference of log of total assets. A similar variable was used by DeYoung and Jang (2016).

H₁: Banks that grow quickly use less funding from stable sources.

Moreover, the independent variables include the log of total assets, which measures bank size. This variable examines whether large banks have funding structures different from those of smaller banks. DeYoung and Jang (2016) suggested that large banks have access to liquidity solutions, such as brokered deposits or loans that can be liquidated when necessary. Therefore, the

expectation for this variable is negative because large banks are less likely to be customer-deposit funded than are smaller banks. Concerning the equity ratio, several studies, such as, e.g., Brewer III, Kaufman and Wall (2008) argue that bank size affects equity ratio negatively. In contrast, the expectation for long-term liabilities is negative because smaller banks are less able to issue debt securities for funding purposes. However, we still expect large banks to have lower ASFs than do smaller banks.

H2: Large banks use less stable funding than do small banks.

Net lending is measured by the ratio of net loans to total assets, which is a control variable for the liquidity of bank assets. This variable controls for the required stable funding in the denominator of the NSFR. DeYoung and Jang (2016) suggested that banks actively set targets for loan-to-deposit ratios and implicitly for the NSFRs from 1992 to 2012. Therefore, this variable examines whether banks with less liquid assets prefer a more stable funding structure. Provided that banks with more illiquid assets prefer longer-term funding, the expectation for this variable is positive.

H3: Banks with illiquid asset portfolios have more funding from stable sources.

In addition, the specification includes a variable for equity ratio. DeYoung and Jang (2016) suggested that banks with large equity buffers can easily borrow liquidity when necessary. Consequently, they might prefer more liquidity risk and use more short-term funding. Therefore, the regression model includes a variable for the equity ratio, the expectation for which is negative because we expect equity to affect negatively the amount of customer funding. A similar variable was used by Demirgük-Kunt and Huizinga (2010). However, their results suggest that equity ratio is not significantly related to nondeposit funding. In comparison, DeYoung and Jang (2016) showed that equity significantly decreases the use of core deposits in bank funding. These authors take this result as evidence for their 'debt capacity' conjecture. The variable for equity is omitted from the regression when the explained variable is the ASF because equity is included in the variable. Furthermore, the expectation for long-term liabilities is ambiguous. Therefore, the variable is left as a control variable with no clear hypothesis.

Moreover, the specification includes a control variable for profitability, which is measured as a ratio of pre-tax profits to total assets. Tirole (2011) suggested that, in the case of a liquidity shock, a bank can use its t-1 income as a source of liquidity. However, the expectation for this

variable is ambiguous. In addition, a macroeconomic control variable for GDP growth is included (as in, e.g., Demirgük-Kunt and Huizinga, 2010). Furthermore, the specifications include year dummies. On top of controlling for general trends among banks, they are interpreted as temporal evolution in the funding types[3]. All the stock variables are lagged by one period, and the error terms are robust[4] in every regression. The independent variable for the equity ratio is excluded from the regression that explains total ASF because equity is part of this variable. Otherwise, the regression model is the same as Equation 1.

3. Descriptive statistics and regression results

3.1. Descriptive statistics

The descriptive statistics for the study variables are shown in Tables 3 and 4. They show (Table 4) that, on average, banks fund more than one-half of their assets from customer deposits, which are easily the largest source of bank funding. The ratio of long-term liabilities to total assets is, on average, 15%. The ratio being higher than the equity ratio, which is, on average, 8%, suggests that liabilities with a long maturity are an important source of bank funding over the 2005–2017 period. Together, customer deposits, equity and long-term liabilities cover approximately 77% of bank liabilities. Moreover, approximately 61% of total bank assets consist of net loans.

Regarding the bank ownership types, many of the differences between commercial banks and cooperative/savings banks are statistically significant. The descriptive statistics for commercial banks suggest that they have the least funding from customer deposits of all the bank ownership types. Their customer deposit-to-total asset ratio is 50%, whereas the cooperative banks' ratio is, on average, significantly higher, at 58%. The mean ratio for savings banks is 56%. Commercial and cooperative banks have the least equity. The long-term liability ratio is highest in the savings banks. This ratio is lowest in the commercial banks. In total, savings banks have, on average, the most stable funding structures. The share of stable funding of their total funding is greater than 85%. Moreover, commercial banks have the most unstable funding profiles. Their

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[3]Besides the year dummies, we also use subperiod dummies indicating the 2008–2009 financial crisis, the sovereign debt crisis from 2010–2014 and the recovery years from 2015–2017 to examine the temporal evolution of long-term funding. The results for these regressions are reported in the appendix. The results are similar to specifications using the year dummies.

[4]In this study, robust standard errors are unclustered heteroscedasticity-consistent standard errors, i.e., Eicker-Huber-White standard errors.

ASF (72%) is 10 percentage points lower than that of the cooperative banks (81%). Cooperative banks' profitability is relatively very low. Furthermore, savings banks grew the fastest over the 2005–2017 period.

TABLE 3 HERE

TABLE 4 HERE

Table 5 shows the annual means for customer deposits, long-term liabilities and equity as ratios to total assets (as percentages). These figures show the general progress in the funding types. In addition, the table shows the annual means for the sum of the three variables, i.e., the proxy variable for a bank's ASF. The means show that the customer deposit funding ratio has increased from 2005–2017. Similarly, the equity ratio has increased. In contrast, banks have decreased the use of long-term liabilities in their funding. Moreover, the decrease is relatively large, at approximately six percentage points from 2005–2017, which has slowed the increase in ASF. Despite this slowing, the ASF has, on average, increased by approximately six percentage points over the 2005–2017 period.

TABLE 5 HERE

FIG. 1 HERE

Fig 1. Bank funding types as percentage of total assets by bank ownership type (2005–2017)

Fig. 1 shows the changes in customer deposit funding ratio, long-term liability ratio, equity ratio and total ASF over the 2005–2017 period. The solid line shows the mean values for commercial banks, short dashed line for cooperative banks and long dashed line for savings banks. The first figure suggests that customer deposit funding ratios have increased for all the bank ownership types. Despite the increase in their customer deposit funding ratio, commercial banks remain less customer deposit funded than cooperative and savings banks[5] because their starting point is the lowest.

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[5]The result for cooperative banks changes when data for regional member banks are used instead of those of parent companies. The figure illustrating the yearly means for the different dataset is presented in the appendix. Descriptive statistics and mean test results are available upon request.

The yearly progress of the long-term liability ratio is contrary to that of customer deposit funding; all the bank ownership types use less funding from long-term liabilities at the end of the sample period than at the beginning. The decrease is largest in cooperative banks. Turning to the equity ratio, there is typically a decrease during the crisis years. The cooperative bank ratio remains, on average, almost stable during the financial crisis. However, it decreases during the sovereign debt crisis. The commercial bank ratio does not decrease during the crisis years and begins to increase from 2012. Savings banks' ratio experiences a dip during the financial crisis. However, commercial banks have, on average, the highest equity ratio at the end of the sample period.

Finally, the fourth figure shows the development of the total ASF, i.e., the sum of customer deposits, long-term liabilities and equity as a ratio to total assets. The figures are different for all the bank ownership types. First, the figure shows that the ASF is by far the lowest for commercial banks on the eve of the financial crisis. The ASF is, on average, approximately 70%, whereas the value for savings banks is 85% from 2005–2007. Therefore, commercial banks' funding stability is noticeably low during the economic swing preceding the financial crisis. However, commercial banks' ASF increases constantly from 2012 onwards. There are no dips in commercial banks' ASF.

Differently from commercial banks, cooperative banks' ASF does not increase during the sample period. The ASF remains constant during the economic boom and the financial crisis of 2008–2009. However, the ASF plummets during the sovereign debt crisis. From 2014, cooperative banks' ASF begins a continuous increase. Savings banks' ASF is, on average, the highest of the three. In addition, it remains almost constant for the full sample period. To conclude, the development in the ASF was, on average, different in all three bank ownership types over the 2005–2017 period.

Table 6 shows annual means for the bank ownership types' ASFs. Furthermore, the asterisks show the results for t-tests with the hypothesis that commercial banks' ASF is, on average, lower than that of cooperative or savings banks. Essentially, the table shows the same information as the fourth graph in Fig. 1 but with the additional t-test results. The test results reveal that cooperative banks' mean ASF is significantly higher than that of commercial banks from 2005–2011, a result visible in Fig. 1. However, there is no significant difference between commercial and cooperative banks from 2012–2013. From 2014–2017, the difference is significant at the 5–10% significance level. Savings bank's ASF is, on average, significantly higher than that of commercial banks. Hence, the statistical significance of the difference in the ASF between

commercial and cooperative banks is not as robust as it is before the sovereign debt crisis. Regarding the difference between cooperative and savings banks, savings banks have a significantly higher ASF than cooperative banks do from 2009 onwards (test results not reported).

TABLE 6 HERE

Table 7 shows the descriptive statistics by median level of ASF. All the variables except GDP growth have statistically significant differences. The figures show that banks in the lower half of the distribution have much less funding from customer deposits than banks in the upper half. Similarly, banks in the upper half have more funding from long-term liabilities. Furthermore, banks in the lower half have less equity. Therefore, all three components of stable funding are higher in the more stable banks. Overall, the ratio of stable funding is approximately 25% lower for banks with a ratio less than the median value. Furthermore, these banks are, on average, more than twelve times as large as banks in the upper half of the distribution. Moreover, their net lending ratio is lower than that of banks in the upper half of the distribution. Finally, banks that have more stable funding profiles are more profitable. In summary, these figures suggest that most differences in funding stability are explained by the customer deposit funding orientation. However, there are also significant differences in the long-term liability and equity ratios. Moreover, banks with unstable funding profiles are significantly larger than are banks with stable funding structures.

3.2. Regression results

Table 8 shows the results for the specifications that explain all four funding types using the full sample. As can be expected, the results show that large banks have less funding from customer deposits. However, they use more long-term liabilities in their funding than do smaller banks. Nonetheless, large banks' ASF is lower than that of smaller banks. One contributing factor is the equity ratio, which is lower in larger banks. Similarly to bank size, bank growth also significantly decreases the ASF because fast-growing banks use less customer deposit funding than do other banks. Similarly, their equity ratio is lower. Furthermore, banks that have a large loan portfolio use more stable funding, which is achieved by using more long-term liabilities.

Turning to the temporal evolution of stable funding, the results are similar to the descriptive statistics. In other words, banks have increased funding from customer deposits and equity. In

contrast, they have decreased the use of long-term liabilities in funding. The latter is more than offset by the former. As a result, Western European banks' ASF has, on average, increased.

TABLE 8 HERE

Table 9 presents the results for the regressions that examine the customer deposit funding ratio by bank ownership type. These regressions are run separately for each bank ownership type. Therefore, there are three regressions. The results show that the coefficient for bank size is significantly negative for all the bank ownership types, indicating that bank size decreases the reliance on customer deposit funding in all the bank ownership types. The magnitude of the coefficient is smallest for commercial banks and largest for cooperative banks. Furthermore, there are differences in the results for the other variables. In particular, bank growth seems to decrease customer deposit funding in cooperative banks and savings banks. Moreover, GDP growth is not significantly related to customer deposit funding in cooperative banks.

Regarding the temporal evolution, the year dummies give different results for the bank ownership types. Commercial banks have increased their use of customer deposits in their funding. This behavior can be seen in the year dummies, which show an almost systematically increasing pattern of positively significant coefficients. Moreover, the coefficients for the latter sample years are large, a result already suggested by Fig. 1. Cooperative banks' customer deposit funding ratio increases during the financial crisis of 2008–2009. After the financial crisis, there is a dip in the ratio. As a result, cooperative banks' customer deposit funding ratio does not significantly differ from the 2005 level in 2010–2011, i.e., during the sovereign debt crisis. Moreover, the coefficients from 2012–2013 are smaller than from 2007. Nonetheless, the ratio begins to increase from 2014. Finally, savings banks' customer deposit funding ratio also increases during the sample period. However, the coefficients for the year dummies from 2016–2017 are smaller than are those of commercial banks, suggesting that after controlling for relevant factors, the increase in customer deposit funding ratio is largest in commercial banks.

TABLE 9 HERE

Table 10 shows the results of the regressions that explain the ratio of long-term liabilities to total assets by bank ownership type. The results show that bank size has no significant effect on the long-term liability ratio in savings banks. Moreover, the results suggest that large commercial and

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cooperative banks use more funding from long-term liabilities than do their smaller counterparts. However, note that the coefficient is also positive in savings banks. In addition, the size of savings banks' coefficient is almost twice that of commercial banks. Other variables are typically insignificant. Net lending ratio increases the use of long-term liabilities in all the bank ownership types.

Regarding the year dummies, the coefficients show results that are different from those concerning the customer deposit funding ratio; all the bank ownership types have reduced the use of long-term liabilities over the 2005–2017 period. However, the decrease is smallest in commercial banks. The coefficients for the year dummies from 2016–2017 are almost twice as large for cooperative banks as they are for commercial banks. Moreover, the decrease seems to begin later in savings banks than in commercial and cooperative banks, as shown by the insignificant year dummies from 2006–2012.

TABLE 10 HERE

The results concerning the equity ratio are shown in Table 11. Similar to the results concerning the customer deposit funding ratio, the coefficient for bank size is significantly negative for all the bank ownership types. Therefore, large banks have less equity. However, there are differences in the magnitude of the results; the result is smallest in cooperative banks. Moreover, the results for equity growth show a different pattern; bank growth decreases equity ratios in commercial and cooperative banks. GDP growth has an effect on the equity ratio in commercial banks. Furthermore, profitability increases equity in all three bank ownership types.

The temporal evolution of the equity ratio reveals that the ratio has increased in every bank ownership type, a point suggested by Fig. 1. The coefficients for 2016–2017 are largest for commercial banks. The coefficients are smallest in savings banks. Moreover, the increase in the equity ratio begins later in savings banks than in commercial and cooperative banks. Despite the differences, all three ownership types have several percentage points higher equity ratios at the end of the sample period, a point suggested by the descriptive statistics.

TABLE 11 HERE

Furthermore, Table 12 shows the results for the specifications that explain total stable funding, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. The

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results show that bank size is a significant determinant of funding stability in commercial banks. In contrast, the coefficients for bank size are insignificant in cooperative banks and savings banks. Table 10 showed that cooperative and savings banks' coefficients for bank size are larger than that of commercial banks when the explained variable is long-term liabilities. In addition, Table 11 showed that cooperative and savings banks coefficients are smaller when the equity ratio is explained. Therefore, although large cooperative and savings banks have lower customer deposit funding ratios than do their smaller counterparts, they use long-term liabilities to fill the "gap" in stable funding caused by lower customer deposit funding ratios. Combined with the less elastic equity ratio, this approach results in the role of bank size that differs from that of commercial banks.

Furthermore, the results suggest that bank growth decreases funding stability in all three bank ownership types. In addition, asset portfolio illiquidity increases funding stability, which can be seen in the significant and positive coefficient for the net lending ratio. This result is the same in every bank ownership type. GDP growth has no effect on the stability of cooperative banks' funding. Similarly, the coefficients for profitability show no systematic pattern; profitability is not significantly related to funding stability in savings banks.

The year dummies explaining the ASF provide results that are a combination of the earlier regressions. Since commercial banks have substantially increased funding from customer deposits and only moderately decreased funding from long-term liabilities, there is a significant increase in their funding stability over the 2005–2017 period. The systematic increase begins from 2012. Turning to cooperative banks, their results differ from those of commercial banks. The coefficients from 2012–2013 are significantly negative, which is the dip that was shown in Fig. 1. Other than these results, the year dummies are insignificant. Therefore, excluding the dip, cooperative banks' ASF has remained unchanged during the sample period. Most savings banks' year dummies are insignificant, indicating that their ASF has not changed over the 2005–2017 period, thus confirming the results shown in Fig. 1.

TABLE 12 HERE

Considered together, the funding stability in commercial banks has, on average, improved over the 2005–2017 period, which is mostly explained by the greater use of customer deposits in commercial banks' funding. In addition, the decrease in long-term liabilities is smallest in commercial banks. In cooperative banks, funding stability dips during the sovereign debt crisis.

However, it recovers from 2017. The savings banks' funding stability remains constant from 2005–2017.

It is possible that the results might parallel trends in the countries in which cooperative banks and savings banks operate. Therefore, the regressions for commercial banks are repeated for the countries where cooperative banks and savings banks are located (see Table 2), because commercial banks in these countries might behave in the same manner as do cooperative and savings banks. Despite excluding the countries without cooperative/savings banks, the results remain the same.

Moreover, Tables 13 and 14 show the results for the regressions that use a pooled sample that includes all the three bank ownership types. These regressions include country-year interactions to control for country-specific shocks in the funding types. These regressions consider the possible country-specific trends in the funding types that might affect the results. Since cooperative and savings banks have concentrated in a few Western European countries, the results might be caused by the development in these countries. To avoid misinterpretation, the regressions are run with country-year interactions for the full sample.

The coefficients in the first specification in Table 13 show that the coefficients for the interaction terms between cooperative bank dummy and year dummies are significantly negative from 2011–2013 and 2016–2017. The interaction terms from 2014–2015 are insignificantly negative. Nonetheless, the results suggest that growth of customer deposit funding has been slower in cooperative banks than in commercial banks, confirming the results of the earlier regressions. The savings banks do not typically differ significantly from commercial banks, which accords with the earlier results.

Turning to long-term liabilities, cooperative banks' interaction terms with the year dummies are all insignificant. Therefore, the decrease in long-term liabilities is not significantly different from that of commercial banks, a point somewhat in contrast with the earlier results. Savings banks' interaction terms from 2006–2011 are typically significantly positive, suggesting that the decrease in long-term liabilities began later in savings banks than in commercial and cooperative banks. This pattern can be seen in Fig. 1. However, beginning in 2012, the interaction terms for savings banks turn insignificant, implying that their long-term liability ratio also begins to decrease. This behavior is also visible in Fig. 1.

TABLE 13 HERE

Table 14 shows the results for the regressions that explain equity ratio and the ASF, with the

specifications including country-year interactions. Cooperative banks' coefficients from 2007–2008 for the year dummies are statistically significant. Nonetheless, coefficients for the interaction variables are insignificant from 2009 onwards. Therefore, equity ratios increase in cooperative banks similarly to the growth in commercial banks. Savings banks typically have significantly negative interaction terms from 2009–2017, which implies that their equity ratio has increased less than have those of cooperative and commercial banks.

Finally, Table 14 shows the results for the total ASF. Similarly to the three previous regressions, this specification includes country-year interactions. The results for the interaction terms between the cooperative bank dummy and the year dummies show that the development of cooperative banks' ASF is behind that of commercial banks from 2013–2017. This result was already suggested by Fig. 1; cooperative banks' funding stability dips during the sovereign debt crisis but not during the 2008–2009 financial crisis. Despite the recovery in cooperative banks' ASF, its progress remains behind that of commercial banks. Turning to savings banks, the interactions terms from 2015–2016 are significantly negative, a result likely caused by the steep increase in commercial banks' ASF at the end of the 2005–2017 period. To conclude, the growth in commercial banks' ASF significantly surpasses cooperative and savings banks' growth during the sample period. In other words, commercial banks' funding stability has improved more than that of cooperative and savings banks over the 2005–2017 period. Robustness checks using the assumptions[6] of King (2013) in calculating the ASF confirm these results. This can be expected because the differences between the bank ownership types are mainly in customer deposit funding ratio. Furthermore, robustness was tested by using longer comparison periods than the year 2006. This did not change the results.

TABLE 14 HERE

The pooled sample was also used to examine the three hypotheses using interaction terms between the bank ownership type dummies and the three continuous variables: bank size, bank growth and net lending ratio. These regressions did not confirm the results of the separate regressions for the bank ownership types. Therefore, these regressions did not show that large cooperative and savings banks use more long-term liabilities in their funding. Similarly, the results did not suggest that bank size is not a significant determinant of funding stability in cooperative and savings banks.

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[6]King (2013) uses BankScope data to calculate a proxy variable for the NSFR. He assumes that 70% of deposits are stable (and thus have a weight of 90%) and 50% of wholesale funding is less than 1 year in maturity (with a weight of 50%). See King (2013) for details.

Therefore, the result is dependent on using the separate samples, suggesting that the result is not very robust. These results are left unreported but they are available upon request.

Lastly, subperiod dummies for the 2008–2009 financial crisis, 2010–2014 sovereign debt crisis[7] and the recovery period from 2015–2017 were used to investigate the temporal evolution of long-term funding. The results for these regressions are reported in the appendix. The results are similar to the earlier regressions. Thus, they confirm that banks have increased using stable funding over the 2005–2017 period. Moreover, the increase begins during the financial crisis. Furthermore, the decrease in long-term liabilities begins during the 2010–2014 sovereign debt crisis and continues during the recovery period. All three bank ownership types have increased funding from customer deposits and decreased funding from long-term liabilities.

4. Discussion

Our results offer many important issues for discussion. First, the results confirm the suggestions of Ayadi et al. (2009), who argued that savings banks have a retail-funded business model. Similarly, Groeneveld (2014) suggested that cooperative banks' business models focus on retail banking. The descriptive statistics of this study show that both cooperative banks and savings banks use more funding from customer deposits than do commercial banks. Consequently, their funding profiles are, on average, more stable than are those of commercial banks. Furthermore, the results show that large banks use less customer deposit funding than do smaller banks. This result is the same as those of DeYoung and Jang (2016), Demirgüç-Kunt and Huizinga (2010), and Feldman and Schmidt (2001), who argued that large banks typically have less customer deposit funding. Consequently, large banks' funding profiles are less stable than are those of smaller banks despite the fact that they use more long-term liabilities in their funding.

Despite the fact that commercial banks have increased their use of customer deposits in their funding since the financial crisis, they still use, on average, less funding from this source than cooperative and savings banks do because cooperative and savings banks also have increased customer deposit funding from 2005–2017. Likely reasons for the change in funding structure are the market turmoil that started the general shift away from wholesale funding (as suggested by ECB, 2007) and the introduction of the NSFR in 2009. Both events gave banks incentives to reduce

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[7]The sovereign debt crisis is defined to end in 2014 even if the crisis does not have a clear ending year. Thus, different periods were used to examine the evolution of bank funding during the financial crisis, the sovereign debt crisis and the recovery period. The results remained unchanged.

their reliance on short-term funding. The change towards deposit funding is a result contrary to that of Gropp and Heider (2010), who showed that banks shifted funding away from deposits over the 1991–2004 period. Since our sample period begins in 2005, our results suggest that the direction in the evolution of bank liability structures has changed.

Contrary to the development in customer deposit funding, banks have reduced the use of long-term liabilities over the 2005–2017 period. Their share relative to total assets has, on average, decreased the most in cooperative banks. Nonetheless, the regression results show that the difference compared with commercial and savings banks is not statistically significant. ECB (2013) suggests that the market turmoil caused by the financial crisis constrained banks to also reduce their issuance of debt securities. Similarly, ECB (2013) argues that banks experienced difficulties in issuing debt because market confidence fell. Thus, the steep decrease in funding from long-term liabilities can be explained by the change in market conditions. Moreover, this development is a result contrary to the suggestion of King (2013), who proposed that the most cost-effective approach for banks to increase the ASF (the liability side of the NSFR) is to extend the maturity of wholesale funding. Differently from this suggestion, the results in this study suggest that banks have rather decreased the use of long-term wholesale funding.

Turning to equity, all three bank ownership types have increased their equity ratios. The increase is, on average, largest in commercial banks. However, regression results show that development in cooperative banks is not statistically significantly different from that of commercial banks. In contrast, savings banks' equity ratio has increased slower than those of commercial and cooperative banks. In any case, the development accords with the general increase in banks' equity ratios since the financial crisis (as suggested, e.g., by ECB, 2017).

Resulting from the positive development in commercial banks and the more stagnated development in cooperative banks, commercial banks' ASF is, on average, much closer to cooperative banks' ASF at the end of the 2005–2017 period than at the beginning of it. This result is robust to inclusion of country-year interactions. Therefore, it is not explained by the development in the countries in which cooperative banks are located. In other words, commercial banks have improved their funding stability more than have cooperative banks. Furthermore, cooperative banks' ASF experiences a steep dip from 2011–2012. This dip is caused by simultaneous decreases in customer deposits, long-term liabilities and equity. Together, they deteriorate cooperative banks' funding stability in such a way that it is not, on average, significantly better than that of commercial banks from 2012–2013. Despite the dip in cooperative banks' funding stability, they reach, on average, their pre-crisis ASF level beginning in 2017. Since

cooperative banks have been able to increase funding from customer deposits and slightly from equity, they have offset the decrease in long-term liabilities.

On average, savings banks have the most stable funding profiles. In addition, their ASF has been relatively stable during the sample period. Therefore, the difference in funding stability between commercial banks and savings banks diminishes over the 2005–2017 period. Moreover, savings banks do not experience a dip similar to that of cooperative banks. Furthermore, even if savings banks reduce funding from long-term liabilities, they are able to substitute customer deposits and equity for that decreased funding. As a result, their ASF is, on average, slightly higher from 2017 than from 2005.

Our results show inconclusive evidence for the role of bank size in funding stability for the bank ownership types. Separate regressions for the bank ownership types suggest that, similarly to large commercial banks, large cooperative and savings banks have less funding from customer deposits than do their smaller counterparts. However, large cooperative and savings banks utilize more funding from long-term liabilities than their smaller equivalents do, thus filling the gap caused by their lower customer deposit funding ratios. As a result, large cooperative and savings banks do not have less stable funding profiles than do smaller cooperative and savings banks. However, using a pooled sample and interaction terms between bank size and bank ownership type dummies yields results that suggest that cooperative and savings banks do not differ from commercial banks in the role of bank size in funding stability. Therefore, the result is dependent on using separate samples.

To conclude, the change from wholesale funding towards more stable funding can be partially attributed to the freeze in wholesale funding markets. The financial turmoil gave banks incentives to acquire funding from more stable sources. However, we believe that it is safe to assume that the introduction of the NSFR also plays a role in the shift towards more stable funding. In other words, the results suggest that the NSFR has succeeded in transforming the banking sector to a more resilient direction. Furthermore, since stakeholder banks' liabilities are more stable than are those of commercial banks, stakeholder banks are better able to meet the requirements of the liquidity regulation. However, the results for cooperative banks are dependent on the consolidation of the data. In particular, if data for bank group members (regional banks) are used instead of data for group parent banks, cooperative banks have significantly less stable funding profiles than do commercial banks (figure presented in the appendix) because cooperative banks utilize interbank funding from other group members to manage their liquidity.

Therefore, the objectives of the new regulation already were partially fulfilled in Western European stakeholder banks during the pre-crisis period because their funding was more stable than that of commercial banks. However, cooperative banks experienced a dip in their funding stability during the sovereign debt crisis. On average, cooperative and savings banks' funding stability from 2017 is roughly at the pre-crisis level. Western European commercial banks have altered their liability structures in a more stable direction over the 2012–2017 period. Therefore, improvements in funding stability have been achieved in Western European commercial banks.

5. Conclusions

This study examined Western European banks' funding structures over the 2005–2017 period. In particular, this study investigated stable sources of bank funding: customer deposits, equity and long-term liabilities. In the context of a liquidity regulation known as the NSFR, these liabilities are seen as the most stable funding sources. Moreover, this study divided banks according to bank ownership type; we examined the funding profiles of commercial banks, cooperative banks and savings banks. A special focus was on the temporal evolution of funding types. To our knowledge, this study is the first to examine the role of bank ownership type in bank funding stability. Similarly, this study is the first on the temporal evolution of bank funding during and after the financial and sovereign debt crises. Therefore, this study contributes to the literature by examining bank liabilities, bank ownership type and funding stability.

The results show that, as can be expected, stakeholder banks use more customer deposit funding than do commercial banks. However, commercial banks have substantially increased their ASF after the financial crisis. As a result, their funding stability is, on average, much closer to that of cooperative and savings banks at the end of the 2005–2017 period than it is at the beginning, a result achieved by increasing funding from customer deposits and equity. All three bank ownership types have reduced funding from long-term liabilities. Furthermore, cooperative banks experience a dip in their funding stability during the sovereign debt crisis, a result of simultaneous decreases in customer deposits, long-term liabilities and equity. Despite the dip, cooperative banks reach, on average, the pre-crisis level in funding stability in 2017. Since savings banks' ASF is relatively constant over the 2005–2017 period, the advancements in Western European banks' funding stability have been achieved in commercial banks.

In addition, large banks use less funding from customer deposits (as, e.g., Demirgüç-Kunt & Huizinga, 2010, and DeYoung & Jang, 2016, show). Consequently, their funding profiles generally are less stable than those of smaller banks. Even if large banks use more long-term liabilities in their funding than smaller banks do, this strategy is not enough to fill the gap caused by their lower customer deposit funding and equity ratios. Therefore, their funding profiles are less stable than those of smaller banks. Moreover, banks with an illiquid asset portfolio tend to use more stable funding than do other banks.

This study examined a proxy variable for the numerator of the NSFR, the ASF. As a proposal for further research, the denominator, i.e., the required stable funding (RSF), and its temporal evolution is a potential research subject. Similarly, the role of bank ownership type in the RSF would produce useful insights on the structure of the Western European banking sector.

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Tables

Table 1. Number of banks in the sample countries (2005–2017)

	Commercial banks	Cooperative banks	Private savings banks	Publicly owned savings banks	Total
Austria	7	1		4	12
Belgium	7	1	1		9
Denmark	13	1	6		20
Finland	2	1			3
France	13	1	1		15
Germany	14	7	1	1	23
Iceland	1				1
Ireland	3				3
Italy	13	21	7		41
Luxembourg	4	1			5
Netherlands	9	1			10
Norway	2		30		32
Portugal	7	1	1		9
Spain	6	2	4		12
Sweden	9		1		10
Switzerland	11	1		1	13
United Kingdom	21	1	1		23
Total	142	40	53	6	241

Table 2. Variable definitions

Customer deposits	Ratio of customer deposits to total assets (%)
Long-term liabilities	Ratio of long-term liabilities (residual maturity > 1 year) to total assets (%)
Equity ratio	Ratio of total equity to total assets (%)
ASF	Sum of customer deposits, equity and long-term liabilities as a share of total assets (%)
Net lending ratio	Ratio of net loans to total assets (%)
log(total assets)	Log of total assets
Δlog(total assets)	The first difference of the log of total assets
ROA	Pre-tax profit to total assets (%)
GDP growth	Growth rate of GDP (%); source: OECD

Table 3. Descriptive statistics for commercial and cooperative banks (2005–2017)

Commercial banks	Mean	S.D.	Min	Max	Median	n
Customer deposits	51.54	21.63	0.17	91.74	53.09	1666
Long-term liabilities	12.83	13.08	0.001	66.16	8.93	1718
Equity ratio	7.88	5.00	1.27	37.54	6.63	1698
ASF	72.06	18.39	16.88	98.30	74.90	1666
Total assets (MEUR)	163,446	363,538	154	2,202,423	13,448	1718
Asset growth (%)	5.92	16.00	-31.86	104.11	3.67	1718
Net lending ratio	53.35	21.89	1.17	91.36	57.31	1705
ROA	0.58	1.26	-7.48	6.47	0.59	1702
GDP growth	1.2	2.6	-9.11	25.6	1.6	1718
Cooperative banks	Mean	S.D.	Min	Max	Median	n
Customer deposits	57.78***	17.53	5.70	91.00	58.24	480
Long-term liabilities	15.10***	11.05	0.01	48.38	13.99	481
Equity ratio	7.69	2.98	1.57	17.32	7.45	481
ASF	80.87***	12.81	22.83	98.13	83.36	478
Total assets (MEUR)	54,478***	121,420	466	750,710	8976	481
Asset growth (%)	5.32	9.75	-27.62	83.48	4.52	481
Net lending ratio	65.15***	12.17	24.22	88.32	66.20	481
ROA	0.32***	0.89	-6.78	3.19	0.39	481
GDP growth	0.6***	2.5	-8.3	8.4	1.1	481

Customer deposits = ratio of customer deposits to total assets. *Long-term liabilities* = ratio of long-term liabilities to total assets. *Equity ratio* = ratio of equity to total assets. *Stable funding* = sum of customer deposits, long-term liabilities and equity as a share of total assets. Asterisks show significance of mean comparison t-tests with the two-sided hypothesis that the mean is different from that of commercial banks. The ratios are expressed as percentages. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 4. Descriptive statistics for savings banks and full sample (2005–2017)

Savings banks	Mean	S.D.	Min	Max	Median	n
Customer deposits	56.28***	12.41	12.60	91.95	55.94	824
Long-term liabilities	21.14***	13.13	0.02	53.99	20.67	825
Equity ratio	8.44***	3.38	2.08	28.78	7.83	818
ASF	85.44***	9.42	23.63	98.28	87.71	804
Total assets (MEUR)	25,851***	108,396	91	1,126,537	4056	825
Asset growth (%)	7.36**	13.71	-25.68	93.57	4.85	825
Net lending ratio	73.36***	11.11	1.61	90.90	75.41	823
ROA	0.65	0.99	-6.08	5.90	0.76	819
GDP growth	1.1	2.2	-8.3	9.4	1.2	825
Full sample	Mean	S.D.	Min	Max	Median	n
Customer deposits	53.87	19.02	0.17	91.95	54.76	2970
Long-term liabilities	15.46	13.28	0.001	66.16	12.08	3024
Equity ratio	8.0	4.33	1.27	37.54	7.13	2997
ASF	77.14	16.66	16.88	98.30	81.11	2948
Total assets (MEUR)	108,575	290,950	91	2,202,423	9017	3024
Asset growth (%)	6.22	14.57	-31.86	104.11	4.21	3024
Net lending ratio	60.71	20.16	1.17	91.36	64.67	3009
ROA	0.56	1.14	-7.48	6.47	0.58	3002
GDP growth	1.1	2.5	-9.1	25.6	1.5	3024

Customer deposits = ratio of customer deposits to total assets. *Long-term liabilities* = ratio of long-term liabilities to total assets. *Equity ratio* = ratio of equity to total assets. *ASF* = sum of customer deposits, long-term liabilities and equity as a share of total assets. Asterisks show significance of mean comparison t-tests with the two-sided hypothesis that the mean is different from that of commercial banks. The ratios are expressed as percentages. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5. Descriptive statistics for customer deposit funding ratio, long-term liability funding ratio, equity ratio and the total ASF (2005–2017)

	Customer deposits	Long-term liabilities	Equity	ASF
2005	49.98	16.74	7.34	74.35
2006	49.69	18.57	7.64	75.23
2007	50.12	18.51	7.46	76.10
2008	50.82	18.42	6.86	75.84
2009	52.83	17.60	7.77	77.87
2010	51.96	17.07	7.85	76.92
2011	52.03	16.70	7.73	76.46
2012	53.93	14.79	8.08	76.10
2013	56.35	13.11	8.38	77.09
2014	56.09	12.63	8.54	77.08
2015	57.46	12.79	8.87	78.62
2016	59.51	11.78	8.74	80.36
2017	60.52	10.64	8.93	80.85

Variables are expressed as percentage of total assets.

Table 6. Mean ASFs by bank ownership type (2005–2017)

2005	70.27	83.82^{***}	85.12^{***}
2006	69.46	82.87^{***}	84.63^{***}
2007	70.85	83.07^{***}	84.35^{***}
2008	69.55	83.42^{***}	85.31^{***}
2009	70.58	83.90^{***}	85.02^{***}
2010	70.81	82.90^{***}	85.77^{***}
2011	70.69	78.59^{***}	85.83^{***}
2012	70.73	74.03	83.52^{***}
2013	72.94	75.22	84.73^{***}
2014	73.08	78.61^{**}	85.87^{***}
2015	74.95	79.98^{*}	86.21^{***}
2016	77.66	82.19^{**}	87.50^{***}
2017	78.11	84.08^{**}	87.68^{***}

Asterisks indicate significance of the one-sided mean comparison t-tests with the one-sided hypothesis that the mean of commercial banks is lower than that of cooperative/savings banks. $^{*} p < 0.10$, $^{**} p < 0.05$, $^{***} p < 0.01$.

Table 7. Descriptive statistics by median level of total stable funding (2005–2017)

Less than the median	Mean	S.D.	Min	Max	Median	n
Customer deposits	43.50***	16.34	0.18	77.11	45.27	1459
Long-term liabilities	14.56***	12.24	0.01	66.16	11.49	1474
Equity ratio	7.02***	3.89	1.27	36.34	6.24	1449
ASF	64.50***	14.59	16.88	81.10	68.86	1474
Total assets	205,194***	390,772	169	2,202,423	28,874	1474
Asset growth (%)	5.67*	15.14	-31.86	104.11	3.65	1474
Net lending ratio	54.74***	19.74	1.22	91.34	59.56	1469
ROA	0.43***	1.18	-6.89	5.08	0.50	1460
GDP growth	1.0	2.8	-9.1	25.6	1.4	1474
Greater than the median	Mean	S.D.	Min	Max	Median	n
Customer deposits	64.39***	14.53	5.58	91.95	65.22	1464
Long-term liabilities	16.43***	14.09	0.001	66.06	13.45	1474
Equity ratio	8.77***	4.06	1.85	34.17	8.05	1473
ASF	89.77***	4.79	81.13	98.30	89.96	1474
Total assets	16,209***	46,985	91	1,126,537	3903	1474
Asset growth (%)	6.68*	13.67	-26.69	103.38	4.65	1474
Net lending ratio	67.09***	17.79	2.05	91.36	71.75	1467
ROA	0.66***	1.04	-7.48	6.43	0.68	1466
GDP growth	1.1	2.2	-8.3	9.4	1.5	1474

Customer deposits = ratio of customer deposits to total assets. *Long-term liabilities* = ratio of long-term liabilities to total assets. *Equity ratio* = ratio of equity to total assets. *ASF* = sum of customer deposits, long-term liabilities and equity as a share of total assets. *Net lending* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All bank-specific variables, except for Total assets and Asset growth, are measured as ratios of total assets and are shown as percentages. Asterisks indicate significance of mean comparison t-tests with the two-sided hypothesis that the means between the groups are different. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 8. Explaining long-term funding for the full sample (2005–2017)

	(1) Customer deposits	(2) Long-term liabilities	(3) Equity ratio	(4) ASF
L.log(total assets)	-9.37***	4.57***	-3.31***	-8.01***
	(1.97)	(1.22)	(0.52)	(1.79)
Δlog(total assets)	-9.55***	1.65	-3.28***	-11.85***
	(2.22)	(1.90)	(0.60)	(2.33)
L.Equity ratio	-0.12	-0.07		
	(0.18)	(0.10)		
L.Net lending	0.08	0.18***	0.004	0.27***
	(0.06)	(0.04)	(0.01)	(0.06)
L.ROA	0.63**	-0.12	0.58***	0.84***
	(0.25)	(0.25)	(0.11)	(0.28)
GDP growth	0.56***	-0.09	0.10***	0.63***
	(0.11)	(0.10)	(0.03)	(0.13)
d2006	-0.17	0.09	0.28	0.26
	(0.70)	(0.57)	(0.18)	(0.77)
d2007	1.06	-0.12	0.45**	1.42
	(0.91)	(0.73)	(0.23)	(1.05)
d2008	3.26***	-1.07	0.15	2.41**
	(0.98)	(0.92)	(0.25)	(1.14)
d2009	6.90***	-2.50**	1.72***	6.48***
	(1.10)	(1.06)	(0.37)	(1.33)
d2010	4.43***	-2.33**	1.38***	3.51***
	(1.09)	(0.99)	(0.36)	(1.27)
d2011	5.42***	-3.58***	1.30***	3.14**
	(1.16)	(1.03)	(0.38)	(1.33)
d2012	8.23***	-6.00***	1.97***	3.98***
	(1.26)	(1.03)	(0.44)	(1.34)
d2013	9.81***	-6.99***	2.32***	4.72***
	(1.28)	(1.11)	(0.44)	(1.34)
d2014	10.60***	-7.89***	2.43***	4.83***
	(1.38)	(1.17)	(0.44)	(1.40)
d2015	11.93***	-7.70***	2.89***	6.43***
	(1.50)	(1.24)	(0.47)	(1.50)
d2016	14.81***	-9.37***	3.08***	8.65***
	(1.55)	(1.28)	(0.47)	(1.49)
d2017	14.22***	-9.39***	3.36***	8.29***
	(1.71)	(1.32)	(0.45)	(1.58)
Constant	129.61***	-32.61***	36.44***	130.79***
	(17.96)	(11.25)	(4.65)	(16.40)
Observations	2970	3024	2997	2948
R^2	0.30	0.20	0.32	0.19
Banks	381	384	384	382

The dependent variable is (1) the ratio of customer deposits to total assets, (2) the ratio of long-term liabilities to total assets, (3) the ratio of total equity to total assets and (4) the ratio of total stable funding to total assets, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Table 9. Explaining customer deposit funding ratio by bank ownership type (2005–2017)

	(1) Customer deposits		(2) Customer deposits		(3) Customer deposits	
L.log(total assets)	-8.29***	(2.40)	-14.71***	(4.95)	-7.49**	(3.43)
Δlog(total assets)	-6.92**	(2.86)	-21.35***	(7.07)	-9.27***	(3.39)
L.Equity ratio	-0.09	(0.24)	-1.06**	(0.46)	0.21	(0.24)
L.Net lending	0.11	(0.08)	0.10	(0.08)	-0.05	(0.09)
L.ROA	0.87***	(0.31)	0.79	(0.71)	-0.34	(0.43)
GDP growth	0.51***	(0.14)	0.48	(0.37)	0.78***	(0.24)
d2006	-0.54	(1.01)	0.43	(1.14)	0.05	(1.02)
d2007	1.34	(1.26)	1.94	(1.47)	-0.41	(1.48)
d2008	3.80***	(1.32)	4.06**	(1.63)	1.64	(1.68)
d2009	7.55***	(1.41)	7.04***	(2.41)	5.72***	(2.12)
d2010	5.02***	(1.37)	3.84	(2.44)	3.39*	(2.00)
d2011	6.57***	(1.43)	2.51	(2.35)	4.35**	(2.10)
d2012	9.58***	(1.52)	5.05**	(2.44)	6.83***	(2.19)
d2013	11.08***	(1.52)	6.21**	(2.63)	8.52***	(2.37)
d2014	11.27***	(1.66)	8.42***	(2.95)	9.56***	(2.28)
d2015	12.62***	(1.85)	11.19***	(3.24)	10.24***	(2.36)
d2016	15.76***	(1.94)	14.16***	(3.23)	12.36***	(2.64)
d2017	15.14***	(2.13)	15.11***	(3.64)	11.06***	(2.82)
Constant	118.94***	(23.29)	189.64***	(45.29)	115.09***	(27.43)
Observations	1666		480		824	
R^2	0.31		0.49		0.33	
Banks	214		52		115	
Sample	Commercial banks		Cooperative banks		Savings banks	

The dependent variable is the ratio of customer deposits to total assets. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 10. Explaining long-term liabilities ratio by bank ownership type (2005–2017)

	(1) Long-term liabilities		(2) Long-term liabilities		(3) Long-term liabilities	
L.log(total assets)	3.37***	(1.24)	11.84***	(2.59)	6.36	(4.39)
Δlog(total assets)	1.43	(2.15)	6.30	(7.73)	0.13	(3.61)
L.Equity ratio	-0.15	(0.12)	0.48	(0.43)	-0.35	(0.25)
L.Net lending	0.11**	(0.05)	0.24**	(0.09)	0.45***	(0.08)
L.ROA	-0.14	(0.30)	-0.10	(0.57)	-0.04	(0.58)
GDP growth	-0.08	(0.12)	0.03	(0.23)	-0.24	(0.31)
d2006	-0.62	(0.77)	-0.03	(1.08)	0.79	(1.07)
d2007	-1.28	(0.92)	-1.12	(1.48)	1.10	(1.61)
d2008	-2.67**	(1.23)	-2.10	(1.87)	0.24	(1.93)
d2009	-4.07***	(1.39)	-3.55	(2.37)	-1.80	(2.60)
d2010	-3.39***	(1.28)	-5.78**	(2.17)	-0.63	(2.47)
d2011	-4.86***	(1.33)	-7.00***	(2.32)	-1.33	(2.74)
d2012	-6.13***	(1.24)	-10.65***	(2.52)	-5.05	(3.11)
d2013	-6.59***	(1.36)	-12.67***	(2.56)	-6.67**	(3.36)
d2014	-7.52***	(1.42)	-13.32***	(2.51)	-7.34**	(3.44)
d2015	-6.70***	(1.50)	-14.31***	(2.69)	-7.65**	(3.59)
d2016	-8.59***	(1.55)	-15.44***	(2.61)	-9.43**	(3.72)
d2017	-8.68***	(1.59)	-15.99***	(2.70)	-9.43**	(3.93)
Constant	-19.70*	(11.91)	-105.83***	(25.82)	-58.12*	(34.57)
Observations	1718		481		825	
R^2	0.13		0.48		0.33	
Banks	217		52		115	
Sample	Commercial banks		Cooperative banks		Savings banks	

The dependent variable is the ratio of long-term liabilities to total assets. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 11. Explaining equity ratio by the bank ownership type (2005–2017)

	(1) Equity ratio		(2) Equity ratio		(3) Equity ratio	
L.log(total assets)	-3.47***	(0.61)	-1.91***	(0.44)	-2.21**	(1.04)
Δlog(total assets)	-4.25***	(0.62)	-1.89***	(0.62)	-0.72	(1.50)
L.Net lending	-0.005	(0.01)	0.03*	(0.01)	0.01	(0.02)
L.ROA	0.48***	(0.14)	0.76***	(0.13)	0.88***	(0.21)
GDP growth	0.11***	(0.03)	-0.01	(0.04)	0.12	(0.08)
d2006	0.22	(0.25)	0.54**	(0.21)	0.13	(0.33)
d2007	0.28	(0.29)	0.87***	(0.24)	0.17	(0.46)
d2008	0.11	(0.33)	0.58**	(0.24)	-0.33	(0.50)
d2009	1.78***	(0.48)	1.05***	(0.34)	1.32**	(0.65)
d2010	1.57***	(0.46)	1.20***	(0.34)	0.53	(0.63)
d2011	1.38***	(0.48)	0.77**	(0.34)	0.81	(0.69)
d2012	2.11***	(0.57)	1.09***	(0.33)	1.23*	(0.69)
d2013	2.44***	(0.56)	1.41***	(0.38)	1.87**	(0.78)
d2014	2.58***	(0.58)	1.85***	(0.38)	1.79**	(0.70)
d2015	3.26***	(0.62)	2.08***	(0.44)	1.90***	(0.72)
d2016	3.20***	(0.61)	2.12***	(0.53)	2.64***	(0.70)
d2017	3.38***	(0.56)	2.36***	(0.46)	3.11***	(0.76)
Constant	39.89***	(5.76)	22.17***	(4.37)	23.85***	(8.34)
Observations	1698		481		818	
R^2	0.35		0.37		0.32	
Banks	217		52		115	
Sample	Commercial banks		Cooperative banks		Savings banks	

The dependent variable is the ratio of total equity to total assets. Equity ratio = ratio of equity to total assets. Net lending ratio = ratio of net loans to total assets. ROA = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 12. Explaining ASF by the bank ownership type (2005–2017)

	(1) ASF		(2) ASF		(3) ASF	
L.log(total assets)	-8.05***	(2.19)	-5.17	(4.04)	-3.38	(3.95)
Δlog(total assets)	-10.34***	(3.14)	-17.85***	(4.41)	-9.90***	(3.70)
L.Net lending	0.22***	(0.08)	0.31***	(0.09)	0.40***	(0.07)
L.ROA	0.89**	(0.36)	1.13*	(0.64)	0.36	(0.44)
GDP growth	0.61***	(0.18)	0.48	(0.40)	0.70***	(0.21)
d2006	-0.78	(1.17)	0.70	(1.42)	0.95	(0.79)
d2007	0.41	(1.55)	1.49	(1.62)	0.85	(1.28)
d2008	1.26	(1.63)	2.31	(1.91)	1.74	(1.74)
d2009	5.51***	(1.86)	4.73	(3.16)	5.63**	(2.50)
d2010	2.95*	(1.74)	-0.35	(2.17)	3.53	(2.25)
d2011	2.84	(1.79)	-3.43	(2.19)	4.05*	(2.44)
d2012	5.09***	(1.74)	-4.12*	(2.23)	2.77	(2.89)
d2013	6.06***	(1.66)	-4.86*	(2.51)	3.72	(3.08)
d2014	5.67***	(1.77)	-2.97	(2.41)	4.12	(2.99)
d2015	8.07***	(1.94)	-1.38	(2.51)	4.23	(2.99)
d2016	10.53***	(1.94)	0.53	(2.61)	5.37*	(3.21)
d2017	9.95***	(2.01)	1.13	(2.73)	4.60	(3.42)
Constant	133.60***	(20.78)	109.20***	(40.14)	80.21***	(30.38)
Observations	1666		478		804	
R^2	0.22		0.39		0.13	
Banks	215		52		115	
Sample	Commercial banks		Cooperative banks		Savings banks	

The dependent variable is the ratio of total stable funding to total assets, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 13. Explaining long-term funding with country-year interactions (2005–2017).

	(1) Customer deposits		(2) Long-term liabilities	
d2006	-1.57	(5.99)	13.31***	(4.82)
d2007	6.73	(6.88)	12.32**	(5.92)
d2008	4.45	(3.41)	-14.13***	(2.66)
d2009	5.76	(25.24)	-72.52***	(20.89)
d2010	6.64***	(2.00)	-9.26***	(1.84)
d2011	8.32*	(4.76)	2.66	(4.25)
d2012	11.47**	(4.58)	-23.98***	(4.63)
d2013	13.41*	(7.29)	-30.75***	(6.77)
d2014	13.17***	(3.83)	-22.63***	(4.10)
d2015	18.59***	(2.91)	-19.54***	(2.98)
d2016	22.07***	(2.90)	-16.28***	(2.27)
d2017	21.11***	(7.75)	-0.24	(5.61)
Coop × d2006	-0.85	(1.78)	1.03	(1.53)
Coop × d2007	-1.02	(2.07)	1.01	(2.02)
Coop × d2008	-1.17	(2.12)	0.71	(2.51)
Coop × d2009	-2.16	(2.21)	0.87	(2.72)
Coop × d2010	-2.54	(2.18)	-0.86	(2.54)
Coop × d2011	-4.06*	(2.13)	-0.40	(2.64)
Coop × d2012	-4.00*	(2.39)	-0.90	(2.82)
Coop × d2013	-4.13*	(2.42)	-1.85	(2.90)
Coop × d2014	-2.75	(2.66)	-1.74	(2.99)
Coop × d2015	-3.68	(2.84)	-2.18	(3.17)
Coop × d2016	-7.43**	(3.10)	-1.40	(3.08)
Coop × d2017	-5.54*	(3.09)	-1.16	(3.05)
Savi × d2006	-1.10	(1.80)	2.47*	(1.36)
Savi × d2007	-3.84**	(1.92)	4.94***	(1.51)
Savi × d2008	-3.16	(2.05)	5.96***	(1.76)
Savi × d2009	-2.91	(2.04)	5.58***	(1.97)
Savi × d2010	-2.62	(2.07)	3.30	(2.06)
Savi × d2011	-2.87	(2.20)	3.89*	(2.05)
Savi × d2012	-3.27	(2.23)	1.33	(2.07)
Savi × d2013	-2.54	(2.44)	0.06	(2.17)
Savi × d2014	0.13	(2.50)	-1.07	(2.37)
Savi × d2015	-0.47	(2.77)	-3.30	(2.53)
Savi × d2016	-1.71	(2.89)	-2.18	(2.52)
Savi × d2017	-0.67	(2.61)	-1.33	(2.52)
L.log(total assets)	-8.45***	(2.11)	3.98***	(1.16)
Δlog(total assets)	-9.24***	(2.35)	2.45	(1.97)
L.Equity ratio	-0.06	(0.18)	-0.19	(0.12)
L.Net lending	0.13**	(0.06)	0.11**	(0.05)
L.ROA	0.50*	(0.26)	-0.37	(0.26)
GDP growth	-0.22	(4.31)	-11.05***	(3.63)
Constant	119.60***	(22.95)	2.00	(14.63)
Observations	2970		3024	
R^2	0.44		0.37	
Banks	381		384	

The dependent variables are (1) the ratio of customer deposits to total assets and (2) the ratio of long-term liabilities to total assets. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. × = an interaction, L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 14. Explaining long-term funding with country-year interactions (2005–2017)

	(1) Equity ratio		(2) ASF	
d2006	-0.12	(1.70)	10.56*	(6.09)
d2007	-1.34	(1.89)	18.81**	(8.50)
d2008	0.67	(0.87)	-9.03**	(4.15)
d2009	7.14	(7.17)	-56.17**	(27.20)
d2010	1.88***	(0.43)	-0.98	(2.43)
d2011	0.52	(1.28)	10.58*	(5.61)
d2012	3.71**	(1.67)	-8.40	(5.11)
d2013	4.49*	(2.43)	-12.26	(8.26)
d2014	4.31***	(1.39)	-5.35	(4.64)
d2015	4.62***	(1.08)	3.25	(3.24)
d2016	4.53***	(0.74)	9.95***	(3.40)
d2017	3.74**	(1.86)	23.32***	(7.91)
Coop × d2006	0.45	(0.40)	0.80	(2.19)
Coop × d2007	0.88**	(0.41)	0.95	(2.68)
Coop × d2008	0.99**	(0.42)	0.41	(2.54)
Coop × d2009	0.20	(0.50)	-0.59	(2.85)
Coop × d2010	0.37	(0.49)	-2.35	(2.55)
Coop × d2011	0.62	(0.52)	-3.57	(2.76)
Coop × d2012	0.45	(0.50)	-3.93	(2.93)
Coop × d2013	0.46	(0.55)	-4.89*	(2.89)
Coop × d2014	0.79	(0.62)	-3.33	(2.94)
Coop × d2015	0.26	(0.65)	-5.10*	(2.79)
Coop × d2016	0.56	(0.76)	-8.47**	(3.42)
Coop × d2017	0.44	(0.75)	-5.85**	(2.96)
Savi × d2006	-0.07	(0.40)	1.30	(1.80)
Savi × d2007	-0.08	(0.46)	0.64	(1.93)
Savi × d2008	-0.38	(0.48)	2.29	(1.92)
Savi × d2009	-0.97*	(0.49)	1.82	(2.14)
Savi × d2010	-1.38***	(0.53)	-0.31	(2.26)
Savi × d2011	-0.87	(0.54)	0.46	(2.35)
Savi × d2012	-1.44**	(0.62)	-3.17	(2.50)
Savi × d2013	-1.35**	(0.56)	-3.22	(2.28)
Savi × d2014	-1.42**	(0.64)	-1.68	(2.47)
Savi × d2015	-1.95***	(0.71)	-5.07*	(2.82)
Savi × d2016	-1.62**	(0.74)	-6.00*	(3.29)
Savi × d2017	-1.35*	(0.82)	-3.56	(2.99)
L.log(total assets)	-3.09***	(0.60)	-7.08***	(1.90)
Δlog(total assets)	-3.45***	(0.52)	-11.12***	(2.55)
L.Net lending	-0.002	(0.01)	0.26***	(0.07)
L.ROA	0.59***	(0.13)	0.36	(0.28)
GDP growth	1.03	(1.22)	-9.57**	(4.55)
Constant	33.18***	(5.89)	146.40***	(20.26)
Observations	2997		2948	
R^2	0.48		0.38	
Banks	384		382	

The dependent variables are (1) the ratio of total equity to total assets and (2) the ratio of total stable funding to total assets, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. × = an interaction, L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.15. Explaining long-term funding (2005–2017)

	(1) Customer deposits	(2) Long-term liabilities	(3) Equity ratio	(4) ASF
L.log(total assets)	-8.05***	3.58***	-3.14***	-7.62***
	(1.86)	(1.13)	(0.50)	(1.70)
Δlog(total assets)	-9.66***	1.95	-3.31***	-11.56***
	(2.26)	(1.92)	(0.61)	(2.33)
L.Equity ratio	0.07	-0.21**		
	(0.19)	(0.10)		
L.Net lending	0.07	0.19***	0.00	0.27***
	(0.06)	(0.04)	(0.01)	(0.06)
L.ROA	0.32	0.07	0.51***	0.68**
	(0.26)	(0.24)	(0.11)	(0.27)
GDP growth	0.25***	0.08	-0.01	0.37***
	(0.09)	(0.08)	(0.02)	(0.09)
Financial crisis	2.85***	-0.72	0.03	2.33***
	(0.62)	(0.64)	(0.15)	(0.73)
Sovereign debt crisis	5.71***	-4.28***	1.19***	2.45***
	(0.76)	(0.65)	(0.28)	(0.81)
Recovery period	11.74***	-7.68***	2.52***	6.46***
	(1.14)	(0.91)	(0.34)	(1.02)
Constant	118.57***	-24.04**	35.59***	128.66***
	(17.04)	(10.50)	(4.63)	(15.87)
Observations	2970	3024	2997	2948
R^2	0.25	0.16	0.27	0.17
Banks	381	384	384	382

The dependent variable is (1) the ratio of customer deposits to total assets, (2) the ratio of long-term liabilities to total assets, (3) the ratio of total equity to total assets and (4) the ratio of total stable funding to total assets, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.16. Explaining commercial banks' long-term funding (2005–2017)

	(1) Customer deposits	(2) Long-term liabilities	(3) Equity ratio	(4) ASF
L.log(total assets)	-7.38***	2.75**	-3.41***	-7.94***
	(2.28)	(1.18)	(0.61)	(2.10)
Δlog(total assets)	-7.65***	1.78	-4.43***	-10.98***
	(2.85)	(2.16)	(0.63)	(3.09)
L.Equity ratio	0.07	-0.24**		
	(0.25)	(0.12)		
L.Net lending	0.11	0.11**	-0.00	0.23***
	(0.08)	(0.05)	(0.01)	(0.08)
L.ROA	0.66**	-0.06	0.43***	0.74**
	(0.32)	(0.29)	(0.14)	(0.34)
GDP growth	0.25**	0.01	0.02	0.35***
	(0.12)	(0.11)	(0.02)	(0.13)
Financial crisis	3.67***	-1.95**	0.23	2.00*
	(0.88)	(0.90)	(0.21)	(1.15)
Sovereign debt crisis	6.98***	-4.29***	1.51***	3.71***
	(0.98)	(0.87)	(0.37)	(1.11)
Recovery period	12.90***	-6.53***	2.86***	8.99***
	(1.50)	(1.16)	(0.44)	(1.34)
Constant	110.63***	-14.21	39.94***	133.32***
	(22.32)	(11.39)	(5.84)	(20.33)
Observations	1666	1718	1698	1666
R^2	0.26	0.11	0.32	0.20
Banks	214	217	217	215

The sample consists of commercial banks. The dependent variable is (1) the ratio of customer deposits to total assets, (2) the ratio of long-term liabilities to total assets, (3) the ratio of total equity to total assets and (4) the ratio of total stable funding to total assets, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. *Financial crisis* is an indicator variable for the years from 2008–2009. *Sovereign debt crisis* is a dummy variable that indicates the years from 2010–2014. *Recovery period* is a dummy variable that indicates the years from 2015–2017. Thus, the comparison years are the years from 2005–2007. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.17. Explaining cooperative banks' long-term funding (2005–2017)

	(1) Customer deposits	(2) Long-term liabilities	(3) Equity ratio	(4) ASF
L.log(total assets)	-12.89**	9.81***	-1.64***	-5.06
	(5.04)	(2.82)	(0.43)	(3.89)
Δlog(total assets)	-22.75***	9.23	-2.22***	-16.39***
	(7.29)	(7.95)	(0.60)	(4.15)
L.Equity ratio	-0.81	0.29		
	(0.49)	(0.48)		
L.Net lending	0.08	0.27***	0.02	0.33***
	(0.08)	(0.09)	(0.01)	(0.09)
L.ROA	0.50	0.16	0.76***	1.13*
	(0.75)	(0.57)	(0.13)	(0.62)
GDP growth	0.16	0.52***	-0.04	0.60***
	(0.21)	(0.17)	(0.03)	(0.22)
Financial crisis	2.47***	0.69	0.02	3.15**
	(0.89)	(1.14)	(0.17)	(1.24)
Sovereign debt crisis	2.48	-7.11***	0.44*	-3.86**
	(1.87)	(1.51)	(0.25)	(1.49)
Recovery period	10.53***	-12.47***	1.35***	-0.73
	(2.84)	(1.95)	(0.36)	(1.98)
Constant	175.09***	-90.67***	20.71***	107.54***
	(45.80)	(28.13)	(4.35)	(38.70)
Observations	480	481	481	478
R^2	0.41	0.40	0.31	0.36
Banks	52	52	52	52

The sample consists of cooperative banks. The dependent variable is (1) the ratio of customer deposits to total assets, (2) the ratio of long-term liabilities to total assets, (3) the ratio of total equity to total assets and (4) the ratio of total stable funding to total assets, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. *Financial crisis* is an indicator variable for the years from 2008–2009. *Sovereign debt crisis* is a dummy variable that indicates the years from 2010–2014. *Recovery period* is a dummy variable that indicates the years from 2015–2017. Thus, the comparison years are the years from 2005–2007. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.18. Explaining savings banks' long-term funding (2005–2017)

	(1) Customer deposits	(2) Long-term liabilities	(3) Equity ratio	(4) ASF
L.log(total assets)	-4.59	3.36	-1.23	-2.57
	(2.78)	(3.20)	(0.85)	(3.05)
Δlog(total assets)	-7.35**	-0.93	0.11	-8.13**
	(3.05)	(3.44)	(1.54)	(3.25)
L.Equity ratio	0.47*	-0.66**		
	(0.26)	(0.26)		
L.Net lending	-0.12	0.51***	0.01	0.39***
	(0.09)	(0.09)	(0.02)	(0.07)
L.ROA	-0.98**	0.57	0.74***	0.12
	(0.41)	(0.55)	(0.22)	(0.39)
GDP growth	0.33*	0.01	-0.05	0.33**
	(0.18)	(0.21)	(0.06)	(0.13)
Financial crisis	1.26	0.26	-0.63***	1.19
	(1.06)	(1.18)	(0.21)	(0.97)
Sovereign debt crisis	3.83***	-2.42	0.19	1.70
	(1.14)	(1.52)	(0.32)	(1.50)
Recovery period	8.49***	-6.77***	1.56***	3.11
	(1.57)	(2.24)	(0.38)	(2.00)
Constant	96.61***	-37.15	17.49**	76.71***
	(23.15)	(26.40)	(6.97)	(24.11)
Observations	824	825	818	804
R^2	0.25	0.27	0.24	0.11
Banks	115	115	115	115

The sample consists of savings banks. The dependent variable is (1) the ratio of customer deposits to total assets, (2) the ratio of long-term liabilities to total assets, (3) the ratio of total equity to total assets and (4) the ratio of total stable funding to total assets, i.e., the sum of customer deposits, long-term liabilities and equity as a share of total assets. *Financial crisis* is an indicator variable for the years from 2008–2009. *Sovereign debt crisis* is a dummy variable that indicates the years from 2010–2014. *Recovery period* is a dummy variable that indicates the years from 2015–2017. Thus, the comparison years are the years from 2005–2007. *Equity ratio* = ratio of equity to total assets. *Net lending ratio* = ratio of net loans to total assets. *ROA* = ratio of pre-tax profit to total assets. All ratios are expressed as percentages. Robust standard errors in parentheses. L = lagged by one period. $^*p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

Appendix

FIG. A.2 HERE

Fig. A.2. Bank funding types by bank ownership type. The data for cooperative banks consist of observations for regional member banks (2005–2017).

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