



# Bank funding stability, pricing strategies and the guidance of depositors<sup>☆</sup>



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## ABSTRACT

Banks face a 'behavioralization' of their balance sheets since deposit funding increasingly consists of non-maturing deposits with uncertain cash flows exposing them to asset liability (ALM) risk. Thus, this study examines the behavior of banks' retail customers regarding non-maturing deposits. Our unique sample comprises the contract and cash flow data for 2.2 million individual contracts from 1991 to 2010. We find that contractual rewards, i.e., qualified interest payments, and government subsidies, effectively stabilize saving behavior and thus bank funding. The probability of an early deposit withdrawal decreases by approximately 40%, and cash flow volatility drops by about 25%. Our findings provide important insights for banks using pricing incentives to steer desired saving patterns for their non-maturing deposit portfolios. Finally, these results are informative regarding the bank liquidity regulations (Basel III) concerning the stability of deposits and the minimum requirements for risk management (European Commission DIRECTIVE 2006/48/EC).

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## 1. Introduction

Increasingly bank funding is based on non-maturing deposits – such as overnight deposits or deposits redeemable at notice. Especially for German banks non-maturing deposits nowadays represent the most important funding source after exhibiting a dynamic growth in the aftermath of the financial crisis of 2008.

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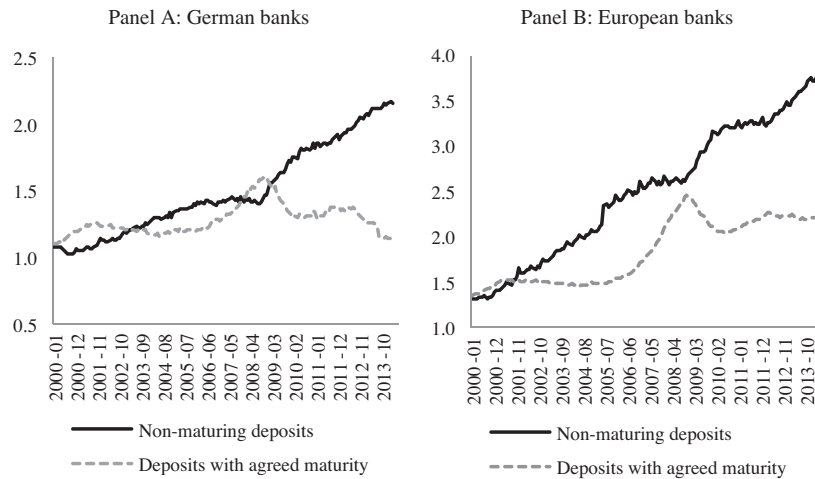
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For all European banks, these deposits gain major shares in their funding portfolios, exposing banks to changing depositor behavior as depicted in Fig. 1:

These structural changes in deposit portfolio composition pose major challenges to banks: While deposits with agreed maturity – such as time deposits or savings bonds – are comparably easy to handle in bank management because of contractual tied saving durations, this does not hold true for non-maturing deposits: In non-maturing products depositors are both free to withdraw their deposited cash at any time or to deposit new cash on their account. Because of ex ante unknown cash flows these product characteristics demand for statistical models to estimate the behavior of depositors. The results of these models substantially affect bank management: The estimated saving duration, i.e., the time duration of deposit commitment, is used to assess a bank's degree of maturity transformation and its true mismatch position of long term assets and short term deposits. Further, an entire bank's cash flow profile depends on the estimated saving durations in non-maturing deposits to a great extent. Therefore, bank managements' key responsibilities such as asset liability management (ALM) risk are extensively affected by assumptions on non-maturing product behavior. Additionally, liquidity risk arises, if the bank has not



**Fig. 1.** Deposit volume evolution. *Notes:* This figure displays aggregate deposit volumes from 01.2000 to 03.2014 for all German banks (acc. to Deutsche Bundesbank) in Panel A and for all European banks (acc. to ECB statistics) in Panel B. The graphs represent non-bank depositors and show volumes in trillion EUR.

anticipated early deposit withdrawals by self-determinedly acting depositors. This directly relates to new financial Basel III regulations requiring classification models for retail deposits being 'stable' or 'less stable' (Basel Committee, 2011).

Thus, for banks relying on deposit funding the individual, self-determined behavior of its retail customers will be most challenging, particular in the current environment of increasing non-maturing deposit volumes and the involved balance sheet 'behavioralization'. This suggests the important question of how banks can influence and guide their depositors towards providing stable funding. In this manner, this study refers to stable deposit funding as being depositors providing funding for long time durations as well as that they save on a smooth and steady way that is not characterized by highly irregular cash flows.

Consequently, this study seeks to analyze to what extent deposit pricing incentives guide the saving behavior of a bank's retail customers. Will it be possible to obtain a different, stabilized portfolio behavior if a bank imposes pricing incentives on its depositors that still are free to move funds from one bank to another on a daily notice?

To answer these questions the study is able to employ a unique and well suited dataset to analyze depositor behavior: A German bank provides full access to its database covering all contract-, cash flow- and customer information for 2.2 million individual saving contracts. We are able to obtain that data from January 1991 to December 2010. This rich dataset is most appropriate for our analysis because the data provider specializes in offering retail saving contracts, whose contract terms are very stable over time. This provides us with a well suited test environment to isolate pure contractual settings and assess how pricing incentives influence customer behavior.

To bring depositors to providing stable funding, the bank offers tariffs with contractual rewards for their customers.<sup>1</sup> First, a saving contract may be equipped with an *interest bonus* (i.e., using a pricing incentive, the customer will be rewarded if she saves for a longer time period). These 'bonus contracts' pay a basis interest and an additional qualified interest on deposited cash if the customer saves longer than 4 years. If depositors withdraw their money within 4 years, they lose their interest bonus but keep the basis interest. This contractual setting allows us to analyze whether the bank can increase the *customers' saving duration* by offering that contractual

reward. If so, the key question becomes by how much can the bank increase the customers' saving persistence? Is early contract termination, on average, reduced by 10%, 20% or 30%? How much longer can the average depositor be induced to provide funds to the bank? Is this effect on customer behavior linear in the interest bonus rates that range from 0.5% to 2.5%?

The second reward that a customer can receive is a government subsidy called *Wohnungsbauprämie (wop)*. In Germany this subsidy is exclusively paid to depositors signing a saving contract like those analyzed in this study and who meet certain eligibility conditions that are determined by a German law. These conditions mainly depend on the customer's taxable income.<sup>2</sup> Savings up to an amount of 1024 EUR (married) or 512 EUR (single) per year are subsidized with a factor of 8.8% (i.e., a customer can receive an extra 90 EUR or 45 EUR per year, respectively). Primarily, the incentive character of this saving subsidy is similar to that of the interest bonus: The depositor loses the complete subsidy if she saves for less than 7 years. In other words, if the customer draws on the deposited cash within 7 years, she must repay the obtained subsidies. Thus, *wop* exhibits a reward characteristic similar to that of the interest bonus. The difference emerges in the required saving duration (i.e., 4 years for the interest bonus vs. 7 years for *wop*).

In addition to the analysis to what extent these two pricing incentives affect the saving duration, the smoothness of the deposit cash inflows is significant to the bank. Thus, is the *volatility of the cash inflows (vola)* reduced by the qualified interest bonus and *wop*? Analyzing the saving duration together with the cash flow volatility will yield a comprehensive method of describing the behavior of retail customers.

Our results are as follows: First, relating to the saving duration, we predict and find that contractual rewards (i.e., qualified interest payments and government benefits) effectively stabilize deposit funding. Turning to the economic significance the probability of early deposit withdrawals decreases by 40%, and cash flow volatility decreases by 25%. More precisely, capital commitment by depositors is even extended for several years. With respect to the question of whether the reward mechanisms are substitutes or complements, our results show that for the contracts with interest bonuses and *wop* eligibility, both rewards will act as complements (i.e., increasing the probability of saving persistence and decreasing cash flow volatility). Last, this study is the first to analyze how the government

<sup>1</sup> For details on the contractual setting and institutional background see Section 3.1.

<sup>2</sup> See [www.bausparkassen.de/uploads/mit\\_download/House\\_Building\\_Premium.pdf](http://www.bausparkassen.de/uploads/mit_download/House_Building_Premium.pdf) for details.

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