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The effects of monetary policy on the composition of bank deposits and on loan supply

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Using US bank level data, this Rue de la Banque shows that when monetary policy tightens, banks with a larger proportion of zero-interest deposits on their balance sheet experience larger increases in their interest-bearing deposit rate. A larger increase in the interest-bearing deposit rate then corresponds to a larger decrease in their loan supply. Therefore, the funding composition of the banking system plays a role in the transmission of monetary policy: the bank lending channel is still at play.

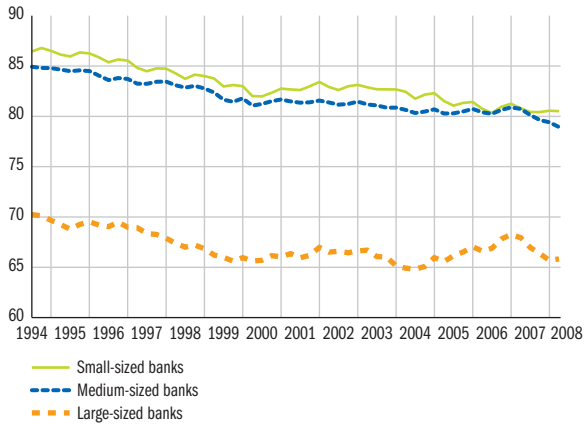
After a prolonged period of decreasing interest rates, major economies are now confronted with discussions on when central banks will progressively increase interest rates. Building on Girotti (2016), this Rue de la Banque describes a mechanism through which monetary policy affects the composition of banks' liabilities and their funding costs. According to this mechanism, when the central bank increases interest rates, commercial banks need to substitute cheap liabilities with increasingly expensive liabilities. As a result, the more banks obtain funding through such cheap liabilities, the more their funding cost increases, and the more they cut back lending.

The existence of this mechanism indicates that bank liability composition determines how banks respond to monetary policy. This, in turn, suggests that the bank lending channel of monetary policy transmission is currently still at play. Central banks should then pay particular attention to how the banking system obtains funding when they aim to modify the monetary policy stance.

Monetary policy alters bank liability composition

Banks obtain funding mainly through deposits. Chart 1 plots the proportion of deposits over total assets for US banks from 1994 to 2008, differentiating by bank size. It appears that on average 80% of a US bank's total assets are funded through deposits. However, a great variety of deposit types exist: demand deposits, savings deposits, time deposits, etc. Until 2011, US regulation explicitly prohibited interest payments on demand deposits. The same restrictions did not apply to other forms of deposits. The fact that some deposits pay interest and others do not is crucial for the following mechanism.

C1 Deposits to total assets ratio in US banks, differentiating by bank size



Sources: Federal Deposit Insurance Corporation (FDIC), statistics on depository institutions; author's calculations.

When households and firms choose the amount of zero-interest deposits, they also consider the returns they would get if they placed the money in alternative liquid investments, such as interest-bearing deposits and Treasury Bills. This argument relates to the literature on money demand (see, for example, Meltzer, 1963). The demand for money, which includes cash and zero-interest deposits, decreases as the nominal interest rate increases, as this is money's opportunity cost.

Consider now the case in which the central bank engages in a monetary policy tightening. Market interest rates increase and depositors may decide to withdraw their zero-interest deposits to invest in more appealing investments. Confronted with the outflow of zero-interest deposits, banks may want to issue more interest-bearing deposits so as to keep their loan supply unaltered. However, if the interest rate demanded to those banks is too high, they may not want to substitute every dollar lost. Instead, they may prefer to decrease their loan supply.

This mechanism would support the so-called "bank lending channel" of monetary policy transmission, according to which, tight monetary policy eventually reduces bank loan supply (Bernanke and Blinder, 1988, and Bernanke and Gertler, 1995). In fact, as suggested by Kashyap and Stein (1994), the link between monetary policy and bank loan supply arises when monetary policy forces banks to substitute funding sources, and this substitution is not costless.

More recently, the existence of the bank lending channel has been put into question (Bernanke, 2007). Since banks have greater access to alternative funding sources than they used to, it could be easier for them to substitute funding outflows. An analysis of this channel may then provide guidance on the debate.

Bank-level analysis

To test the mechanism under review, I consider yearly data from every US commercial and savings bank from 30 June 1994 to 30 June 2008. I then study whether banks with a larger part of their balance sheet funded through zero-interest deposits experience larger increases in their interest-bearing deposit rate and larger decreases in their loan supply after a monetary policy tightening.

An empirical challenge

This empirical model presents a challenge: bank liability composition depends on unobservable characteristics that may also affect the way the bank responds to monetary policy.

Consider, for example, the case in which a bank designs its banking services to meet the tastes of its customer base. As a result, such a bank may collect zero-interest deposits quite easily. But, for the same reason, the bank may also be able to retain such deposits to a greater extent when monetary policy tightens. This implies that the characteristic of "having well-designed banking services" influences both the bank's liability composition and its reaction to monetary policy. However, that characteristic is not observable. Such an endogeneity leads to biased and unreliable estimates.

Making use of instrumental variables techniques helps to overcome this issue. The idea is to quantify the mechanism of interest using the part of banks' proportion of zero-interest deposits that is due to exogenous factors. In this respect, exogenous variables that influence the quantity of zero-interest deposits available to each bank need to be found.

Demographic characteristics affect bank liability composition

Using household-level data, I find evidence that demographic characteristics influence the supply of zero-interest deposits by households and firms. For example, the older the household, the larger the amounts in that household's checking accounts. In aggregate, therefore, as population age increases, local banks may have a relatively higher proportion of zero-interest deposits.

I obtain a broad set of county-year level demographic and economic characteristics, and aggregate them to the bank-year level depending on where each bank has its branches. I then show that demographic and economic changes alter the quantity of zero-interest deposits available to banks, and the effects are consistent with the household-level analysis.

Finally, the projections of bank liability composition on such shifters are used as explanatory variables in the regression of interest.

Thanks to this instrumentation strategy, the mechanism is identified only from the exogenous portion of bank liability composition. Moreover, given the control variables used, the effects of interest are net of deposit supply and loan demand shocks, which may otherwise contaminate the identification.

Evidence of the mechanism

The bank-level data confirm the mechanism.

First, in periods of tight monetary policy, the quantity of zero-interest deposits available to banks decreases, and banks substitute such outflows by issuing interest-bearing deposits.

Second, this substitution happens at increasing interest rates. In fact, the more banks obtain funding through zero-interest deposits before a monetary policy tightening, the larger the increase in the interest-bearing deposit rate when the monetary policy change happens.

Third, the larger increase in the interest-bearing deposit rate discourages loan growth to an even greater extent.

To quantify the magnitude of the effects on the interest-bearing deposit rate and loan growth, I consider the monetary policy tightening experienced by the US between 30 June 2004 and 30 June 2005. During that period, the Federal funds rate increased by 119 bps. Using the estimated parameters, I measure the effects on banks' interest-bearing deposit rate and loan growth that are due to the substitution of zero-interest deposits with interest-bearing deposits.

I find that a bank with an additional standard deviation of zero-interest deposits as of 30 June 2004 would have paid interest bearing deposits 2 bps more in the following period. This corresponds to a decrease in loan growth of 0.2% in terms of total assets.

In the cross-section, a bank at the 99th percentile for the initial proportion of zero-interest deposits pays almost 9 bps more than a bank at the first percentile. This translates into a larger decrease of its lending of about 0.7% of total assets.

Considerations on the mechanism and lessons for the conduct of monetary policy

The data confirm the existence of the mechanism. Additionally, they indicate that the quantitative effects are mainly important on the cross-section, while they are moderate for the average bank.

Since banks have heterogeneous liability structures, the mechanism outlined affects the cross-section of banks differently. In fact, the effects on the interest-bearing deposit rate and loan supply of a monetary policy change can be sizeable for those banks that rely mainly on cheap liabilities as a funding source.

Conversely, the effects for the average bank are relatively mild. There are two reasons for this. First, on average, US banks do not obtain a large part of their funding through zero-interest deposits. In fact, the proportion of zero-interest deposits to total assets is around 12% on average. So, when monetary policy tightens, the proportional outflow is moderate. Second, the sensitivity of zero-interest deposits to the Federal funds rate is mild.

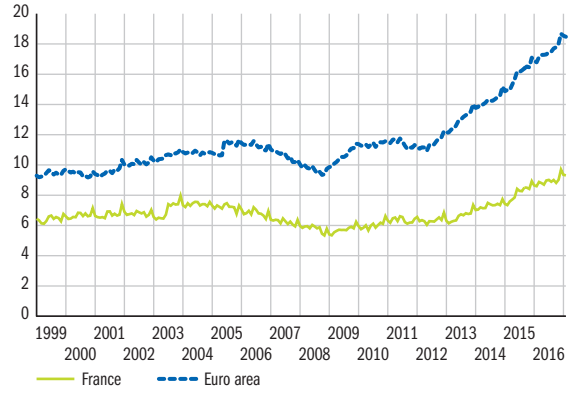
To conclude, the evidence presented in this Rue de la Banque indicates that the funding composition of the banking system plays a role in the transmission of monetary policy and that the bank lending channel is still at play.

The mechanism outlined would be significantly more powerful in a banking system that obtains funding primarily through cheap liabilities. Thus, in the conduct of monetary policy, central banks should look at the way banks obtain funding as an important input for their decisions.

In the euro area and in France, overnight deposits may pay interest but such interest tends to be very small. Thus, following the mechanism described, these are the deposits that investors may want to substitute with more profitable investments when monetary policy tightens.

Chart 2 presents the average proportion of overnight deposits over total assets for French and euro area banks. At the beginning of 2017, French banks backed slightly more than 9% of their total assets by overnight deposits. That chart more than doubles for euro area banks. These numbers suggest that the mechanism described may therefore be particularly important for euro area banks, and less for French banks.

C2 Overnight deposits to total assets ratio in French and euro area banks



Sources: European Central Bank and author's calculations.

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