

### Short Exercise: Estimation of Monetary Policy Transmission with Loan-level data

The Central Bank asks you to estimate the pass-through of monetary policy shocks to bank lending. You have access to: i) the National Credit Registry, with information on loan volume, rate and collateral; ii) supervisory bank balance-sheet data with information on bank asset size, common equity tier-1 ratio, share of liquid assets and deposits (expressed as a % of total assets).

1. Estimate the average pass-through of monetary policy shocks on loan rates, volume, and collateral. Discuss the strength of the pass-through and the robustness of your estimates.
2. Provide evidence of different credit channels through loan-level estimates. Discuss their relative strength of the different channels and the robustness of your estimates. You may want to consider:
  - a. *Liquid Assets* → based on Kashyap and Stein (2000, AER), banks with higher share of liquid assets better withstand monetary contractions, as these can be mobilize to replace forgone deposits
  - b. *Capital Ratio* → Many studies (including e.g. Borio and Zhu, 2012 JFS; Jiménez et al., 2012 AER) show that banks with low capital reduce lending more when the policy rate goes up
  - c. *Deposits* → Drechsler et al. (2018, QJE) argue that banks exploit market power and increase the deposit spread (i.e., the difference between the Effective Fed Funds Rate and the rate on customer deposits) when the policy rate increases, leading to a deposit outflow and associated reduction in lending. In our data, you can assume that all banks have same market power, therefore exposure to monetary policy through this channel is proxied by the volume of deposits.

### Practical guidance

i) Below you find all the info on the variables contained in the NCR data.

ii) You can run this exercise with the program you are most familiar with. If you prefer other programs than Stata, you can work with data in .txt format (delimiter: “;”).

If you use Stata, you might find useful to use the command **reghdfe**.

If not installed in your Stata, please run:

- **ssc install reghdfe**

This command is useful for estimating regressions (reg) based on high-dimensional fixed effects (hdfe).

It works as follows. Assume you want to estimate a regression of **y** over the vector of coveraties **X**, while controlling for different fixed-effects dummies **F1, F2,...,Fj**. Interestingly, this command also allows for multi-way clustering, say over cluster-groups **C1, C2, ...,Ck**.

Then you can simply run:

- **reghdfe y X, absorb(F1 F2 .... Fj) vce(cluster C1 C2 .... Ck)**

Note: using alternative programs for fixed effects estimation (xtreg, areg) might lead to very slow estimations when N is a large and the fixed-effects vectors contain a large number of dummies.

**Data**

Variable	Definition	Scale/Format
firmid	unique firm identifier	number
bankid	unique bank identifier	number
date_q	Current date	Quarterly date
lncredit	Outstanding credit granted by bank “b” to firm “f”	Logs
intrate	Average interest rate on credit granted by bank “b” to firm “f”	% (1=1%)
mpshock_l	(Lagged by 1-quarter) Monetary Policy Shock	% (1=1%)
gdp_l	(Lagged by 1-quarter) GDP annual growth rate	% (1=1%)
infl_l	(Lagged by 1-quarter) annual inflation rate	% (1=1%)
bdepo_l	(Lagged by 1-quarter) bank deposits	% of Total Assets
bcet1_l	(Lagged by 1-quarter) common equity tier-1 capital	% of Risk-Weighted Assets
blar_l	(Lagged by 1-quarter) liquid assets	% of Total Assets
bsize_l	(Lagged by 1-quarter) Total Assets	Logs