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MONETARY POLICY AT THE MARGIN

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MPC TASK FORCE ON BANKING ANALYSIS FOR MONETARY POLICY
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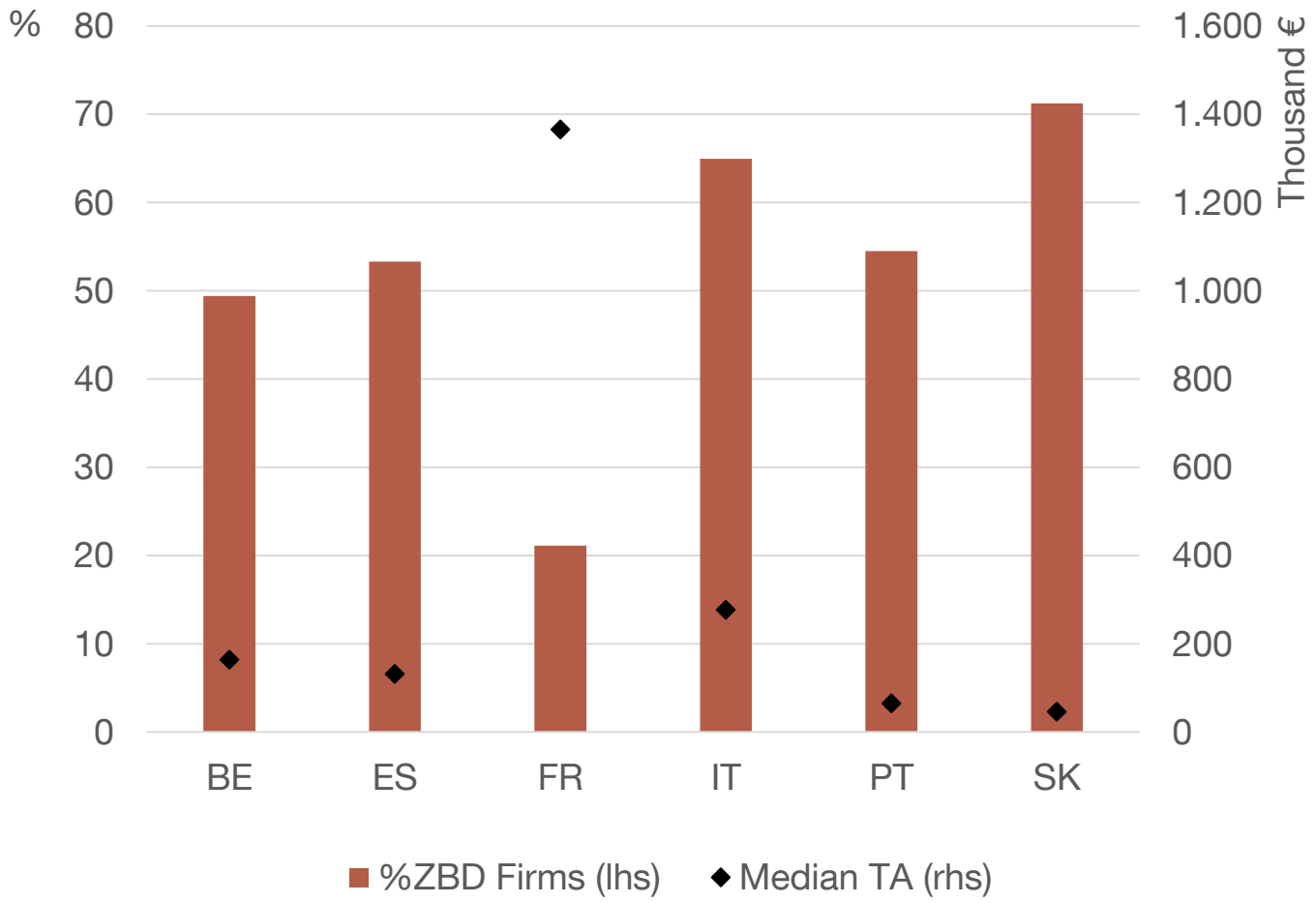
ZERO-BANK-DEBT FIRMS CONSTITUTE A SIZEABLE GROUP IN MANY EUROPEAN COUNTRIES



Source: Authors' elaboration from iBACH for 2018

- **The existence of zero-debt firms (supply- and demand-side theories)**
  - **Supply-side (credit constraints)**: Devos et al., 2012; Bessler et al., 2013; Dang, 2013; Byoun and Xu, 2013; Kokoreva and Ivanova, 2016; Meng, 2021)
  - **Demand-side** (firms **voluntarily choose** this capital structure): Agrawal and Nagarajan (1990), Graham and Harvey (2001), Marchica and Mura (2010), De Jong et al. (2012), Strebulaev and Yang (2013), Rapp et al. (2014).

- **Small firms' access to credit (relationship lenders vs. transaction lenders):** Petersen and Rajan (1994), Berger and Udell (1995), Berger et al. (2001).

- **Bank-lending channel of monetary policy:** Kashyap and Stein (1994), Holton and d'Acri (2018), Kashyap and Stein (2000), Kishan and Opiela (2000), Maddaloni and Peydró (2011), Van den Heuvel (2012), and Drechsler et al. (2017).

- **Zero-bank-debt firms (ZBD firms) are much less likely to have access to bank financing than comparable firms with previous bank debt (non-ZBD firms) due to their lack of credit history, which increases information asymmetries**
  - These constraints are more severe when firms are poorly capitalized, have a lower share of liquid assets and a lower proportion of tangible assets, hold intangible assets, exhibit negative sales growth, and are mature (>5 years old)
- **Asymmetric transmission of monetary policy (MP)**
  - Overall MP does not affect the likelihood that a ZBD firm obtains credit for the first time
  - While contractionary MP does not change the probability that ZBD firms obtain credit, *expansionary* monetary policy eases the credit constraints faced by those firms, especially when they are *young*
- **ZBD firms have a *lower* probability of having NPLs in one and two years after they obtained a loan than comparable non-ZBD firms**
  - Banks may engage more intensively in screening & monitoring activities when granting loans to ZBD firms than to non-ZBD firms, as they have less information on the former
  - However, neither accommodative nor contractionary monetary policy have any differential impact on the probability that ZBD firms have NPLs relative to non-ZBD firms

- **ZBD firms that obtain credit exhibit greater employment growth and increase capital investment more than comparable non-ZBD firms**
  - ZBD firms may have very good investment opportunities that can only be exploited if their loan applications are approved, as they lack alternative funding sources
- **Real effects of MP**
  - Contractionary monetary policy does not have a robust differential effect on the employment growth or investment of ZBD firms relative to non-ZBD firms
  - Expansionary monetary policy has a greater (positive) effect on the employment growth of ZBD firms than on non-ZBD firms
  - Expansionary monetary policy has a greater (positive) effect on the investment of ZBD firms than on non-ZBD firms in the segment of young firms (<5 years old), while there is no differential impact in mature firms

ROADMAP

1. Dataset and main variables
2. Main identification challenges
3. Access to credit by ZBD firms and monetary policy
4. The performance of first-time borrowers

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We combine three administrative datasets managed by the Banco de España. 2006-2023

- **Central Balance Sheet Data Office (CBSDO)**
  - Financial information mandatorily filed by Spanish firms
    - *Information on the firm's fiscal identifier, sector of activity, location, firm's creation date, employees, corporative structure, legal form, demographic status, whether it is listed or not*
- **Credit Register (CIR)**
  - Granular information on all the loans (new and outstanding) granted by all
    - *Information on the firm's fiscal identifier, the lending bank, and the loan characteristics*
- **Information requests**
  - Requests for information on the credit situation of specific firms made by banks to CIR
  - Mainly concern to banks' potential customers: proxy for **loan applications**

- **Dependent variables**
  - $New\ Credit_{f,t}$ ➔ *0/1* variable that equals one if the firm obtained new bank credit (either term loans or credit lines) in any month of year *t*
  - $NPL_{f,t+h}$ ➔ *0/1* variable that equals one if the firm has NPLs in the year *t* + *h* (h=1 or h=2)
  - $\Delta log(Employment_{t-1,t+1})$ and $\Delta log(Employment_{t-1,t})$: employment growth
  - $\Delta log(Fixed\ Assets_{t-1,t+1})$ and $\Delta log(Fixed\ Assets_{t-1,t})$: capital investment
- **Main explanatory variables**
  - $ZBD_{f,t}$ ➔ $0/1$ variable that equals one in year *t* if: (i) the firm had no (drawn or undrawn) bank debt in any month over the previous five years and it is at least six years old or (ii) it had no bank debt in any month over the previous years and it is less than six years old

- **Main explanatory variables (2):**
  - $\Delta Dec\ Euribor3m_t$ ➔ change in the 3-month Euribor between December of year *t* and December of year *t–1*
  - $\Delta Avg\ Euribor3m_t$ ➔ change in the average 3–month Euribor between year *t* and year *t – 1*
  - $\Delta LIncMP_t$ ➔ interaction of monetary policy changes ($\Delta Dec\ Euribor3m_t$ OR $\Delta Avg\ Euribor3m_t$) with a dummy variable that equals one when changes in the 3-month Euribor are in the top tercile of the annual distribution (Large interest rate Increases)
  - $\Delta LDecMP_t$ ➔ interaction of monetary policy changes ($\Delta Dec\ Euribor3m_t$ OR $\Delta Avg\ Euribor3m_t$) with a dummy variable that equals one when changes in the 3-month Euribor are in the bottom tercile of the annual distribution (Large interest rate Decreases)

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- **MIC #1: to disentangle credit supply from credit demand**
  - Some ZBD firms in the full sample may face credit constraints, but the sample also includes ZBD firms that may voluntarily choose that capital structure
  - We restrict our analysis to a subsample of ZBD firms that demand credit (those that apply for new loans) and non-ZBD firms that are very likely to do so because a significant proportion of their interest-bearing debt (>25%) is maturing in the short run (next 12 months)
  - We also include industry-location-size-year fixed effects (Degryse et al. (2019)), which allows to compare a ZBD firm with a similar non-ZBD firm that is currently searching for a new loan, operating in the same industry and location, of similar size, and in the same year

- **MIC #2: violation of the "common support" assumption (treated and control units are very different)**
  - ZBD firms are different from non-ZBD firms in many dimensions. They are smaller, younger, have higher shares of liquid assets and working capital, exhibit higher equity ratios, have lower shares of tangible fixed assets, and are less profitable
  - OLS may yield inconsistent estimates
  - Dehejia and Wahba (2002): estimate weighted regressions, deriving the weights from Propensity Score Matching (PSM) based on cross-sectional logit regressions that estimate the probability of being a ZBD firm. Non-ZBD firms (the control group) are weighted by the number of times they are matched to a ZBD firm (the treatment group)

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- **Overall Monetary Policy (MP)**

$$NewCredit_{f,t} = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta Avg\ Euribor3m_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

$$NewCredit_{f,t} = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta Dec\ Euribor3m_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

  - $\Delta Dec\ Euribor3m_t$ ➔ change in the 3-month Euribor between December of year *t* and December of year *t–1*
  - $\Delta Avg\ Euribor3m_t$ ➔ change in the average 3–month Euribor between year *t* and year *t – 1*
  - $X_{f,t-1}$ is a set of control variables at the firm level: ratio of equity to total assets, ratio of liquid assets to total assets, ratio of working capital to total assets, ratio of tangible fixed assets to total assets, ROA, log of total assets, age, and the ratio of corporate taxes to total assets.
  - $\eta_{i,l,s,t}$ are industry-location-size-time fixed effects

- The weighted regressions are conducted on the matched sample of firms that demand credit

- **Distinguishing between contractionary and expansionary MP**

$$NewCredit_{f,t} = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta LIncMP_t + \beta_3 ZBD_{f,t-1} x \Delta LDecMP_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

  - $\Delta LIncMP_t$ captures monetary policy changes above the 66th percentile of the distribution
  - $\Delta LDecMP_t$ captures changes below the 33rd percentile, considering the absolute value for readability
  - $X_{f,t-1}$ is a set of control variables at the firm level: ratio of equity to total assets, ratio of liquid assets to total assets, ratio of working capital to total assets, ratio of tangible fixed assets to total assets, ROA, log of total assets, age, and the ratio of corporate taxes to total assets.
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- **Effect on non-performing loans (NPLs)**

$$NPL_{f,t+h} = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta LIncMP_t + \beta_3 ZBD_{f,t-1} x \Delta LDecMP_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

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- **Effect on employment growth**

$$\Delta log\left(Employment_{t-1,t+1}\right) = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta LIncMP_t + \beta_3 ZBD_{f,t-1} x \Delta LDecMP_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

$$\Delta log\left(Employment_{t-1,t}\right) = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta LIncMP_t + \beta_3 ZBD_{f,t-1} x \Delta LDecMP_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

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  - $\eta_{i,l,s,t}$ are industry-location-size-time fixed effects

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- **Effect on capital investment**

$$\Delta log\left(Fixed\ Assets_{t-1,t+1}\right) = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta LIncMP_t + \beta_3 ZBD_{f,t-1} x \Delta LDecMP_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

$$\Delta log\left(Fixed\ Assets_{t-1,t}\right) = \beta_1 ZBD_{f,t-1} + \beta_2 ZBD_{f,t-1} x \Delta LIncMP_t + \beta_3 ZBD_{f,t-1} x \Delta LDecMP_t + \theta X_{f,t-1} + \eta_{i,l,s,t} + \epsilon_{f,t}$$

  - $\Delta LIncMP_t$ captures monetary policy changes above the 66th percentile of the distribution
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  - $X_{f,t-1}$ is a set of control variables at the firm level: ratio of equity to total assets, ratio of liquid assets to total assets, ratio of working capital to total assets, ratio of tangible fixed assets to total assets, ROA, log of total assets, age, and the ratio of corporate taxes to total assets.
  - $\eta_{i,l,s,t}$ are industry-location-size-time fixed effects

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THANKS FOR YOUR ATTENTION