

setting the scene on the session on
*Corporate Debt, the Financial Sector and
Financial Crises*

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Outline for my talk

I want to make two main points related to the topic of this session:

1. A more diversified financial system, including deep capital markets in addition to banks, would reduce the negative real effects that banking crises bring for the overall economy
 - I present some evidence from US, Germany, Portugal and Spain
2. Banks that trade on fixed income securities may reduce the supply of credit to the real sector in financial crises, as it may be more profitable for banks to hoard liquidity and then buy securities when there are high fire sales of securities and sell them when fire sales disappear
 - I present evidence for Germany

Note: I do not stress in this presentation the good times, but only financial crises (though financial crises are generated after large leverage booms)

Slides based on my following research:

- “Systemic Risk, Crises and Macroprudential Policy,” *MIT Press*, (co-authored with Xavier Freixas and Luc Laeven)
- "Securities Trading by Banks and Credit Supply: Micro-Evidence," (with Puriya Abbassi, Raj Iyer and Francesc Tous). Forthcoming at the *Journal of Financial Economics*.
- "The Interbank Liquidity Crunch and the Firm Credit Crunch: Evidence from the 2007-09 Crisis" (with Rajkamal Iyer, Samuel Lopes and Antoinette Schoar), *Review of Financial Studies*, 24 (6), 2121-2165, 2014.
- "Credit Supply and Monetary Policy: Identifying the Bank Balance-Sheet Channel with Loan Applications"(with Gabriel Jiménez, Steven Ongena and Jesús Saurina), *American Economic Review*, August vol. 102: 5, 2301-26, 2012.
- “Substitution between Corporate Debt and Bank Loans: US and European evidence,” **work in progress** (with Adelina Barbalau and Francesco Ruggiero)

Financial crises and credit cycles

- Western Europe and USA suffered a financial (mainly banking) crisis, followed by a severe economic recession. These phenomena are not unique: Banking crises are recurrent, triggering deep, long-lasting recessions
 - Reinhart & Rogoff (2009), Schularick & Taylor (AER 2012), Laeven and Valencia (2010) ...
 - A key channel by which banks' balance-sheet weaknesses affect the real sector is via a reduction of credit supply
 - Bernanke (AER 1983), Jiménez, Ongena, Peydró and Saurina (AER, 2012) ...
 - Banking crises, moreover, come after periods of very strong credit growth
 - Kindleberger (1978), Schularick & Taylor (AER 2012)- also with Jorda, Gourinchas & Obstfeld (AEJ Macro 2012), Bordo & Meissner (2012) ...
- ➔ crucial to understand credit, both in good and bad times (cycles)

Credit cycles and financial frictions

- Credit cycles due to financial frictions in:

Banks (credit supply)

- Rajan (QJE, 1994), Holmström & Tirole (QJE, 1997), Allen & Gale (2007), Diamond & Rajan (JPE, 2001, AER, 2006 & QJE, 2012), Adrian & Shin (Handbook, 2011), Shleifer & Vishny (JFE & AER, 2010), Tirole (2011), Gersbach & Rochet (2012) ...

Non-financial sector (credit demand)

- Bernanke & Gertler (AER, 1989), Kiyotaki & Moore (JPE, 1997), Lorenzoni (RES, 2008), Jeanne & Korinek (2011) ...

where credit growth is 7% on average in good times before banking crises and -2% after the start of the crises (Schularick & Taylor (AER, 2012))

Let me first concentrate on credit supply cycles

- Credit cycles due to bank frictions (“excessive” bank pro-cyclicality)

In bad times (ex-post):

- Problem: credit crunch by banks due to e.g. low capital since bank capital increase is then very costly, may be lower than socially optimal and affects bank funding liquidity
 - e.g. Freixas, Laeven and Peydró (MIT, 2015), Iyer & Peydró (RFS 2011), Gertler, Kiyotaki & Queralto (2011)...

In good times (ex-ante):

- Problem: high credit supply (seeds for the next crisis) since e.g. banks have little capital (owned shareholder funds) at stake
 - e.g. Freixas, Laeven and Peydró (MIT, 2015), Holmström & Tirole (QJE 1997)...

Macroprudential policy and credit cycles

- The strong, negative real effects stemming from financial crises imply that regulation needs to move into a macroprudential direction, ultimately aims at reducing the strong negative externalities from the financial to the real sector
 - Borio (2003), Trichet (2010), Bernanke (2011), Tirole (2011), Freixas, Laeven and Peydró (MIT, 2015)...
 - Systemic orientation of macropru vs. individual safety of "microprudential": e.g., credit supply reduction to the real sector due to deleveraging of a bank after a negative balance-sheet shock (Hanson, Kashyap & Stein (JEP 2011), Freixas, Laeven and Peydró (MIT, 2015)...)

Other solutions

- Firms should not only rely on banks to obtain finance, but also from capital markets, both corporate debt but also more equity (a more diversified financial system)
- In bad times:
 - Problem: e.g. credit crunch by banks due to low capital (later I will show another channel)
 - Potential solutions:
 - Higher bank capital buffers built in good times to support credit supply in bad times (less need of government help)
 - A more diversified financial system: Corporate debt, etc.

Note: I do not stress in this presentation the good times, but only financial crises (though financial crises are generated after large leverage booms). For policies in good times, see Freixas, Laeven and Peydró (MIT Press, 2015)

AER (2012): problems of credit supply by banks

- We analyze the effects of 2008-10 crisis and monetary policy on bank credit supply
- Accounting for time-varying firm heterogeneity in loan demand (Spanish data until 2010), we find that tighter monetary and worse economic conditions substantially reduce loan granting, especially from banks with lower capital or liquidity ratios
- Responding to applications for the same loan, weak banks are less likely to grant the loan (i.e., a capital crunch implies a credit crunch)
- Firms cannot offset the resultant credit restriction by applying to other banks
 - So, finance is not like restaurants, so if a restaurant is bad, then you go to another one frictionless (in finance, substitution is much more costly, e.g. the winners curse). Moreover, monetary policy is crucial to combat credit crunches, but it has limits

RFS (2014) paper on credit supply and bonds: question

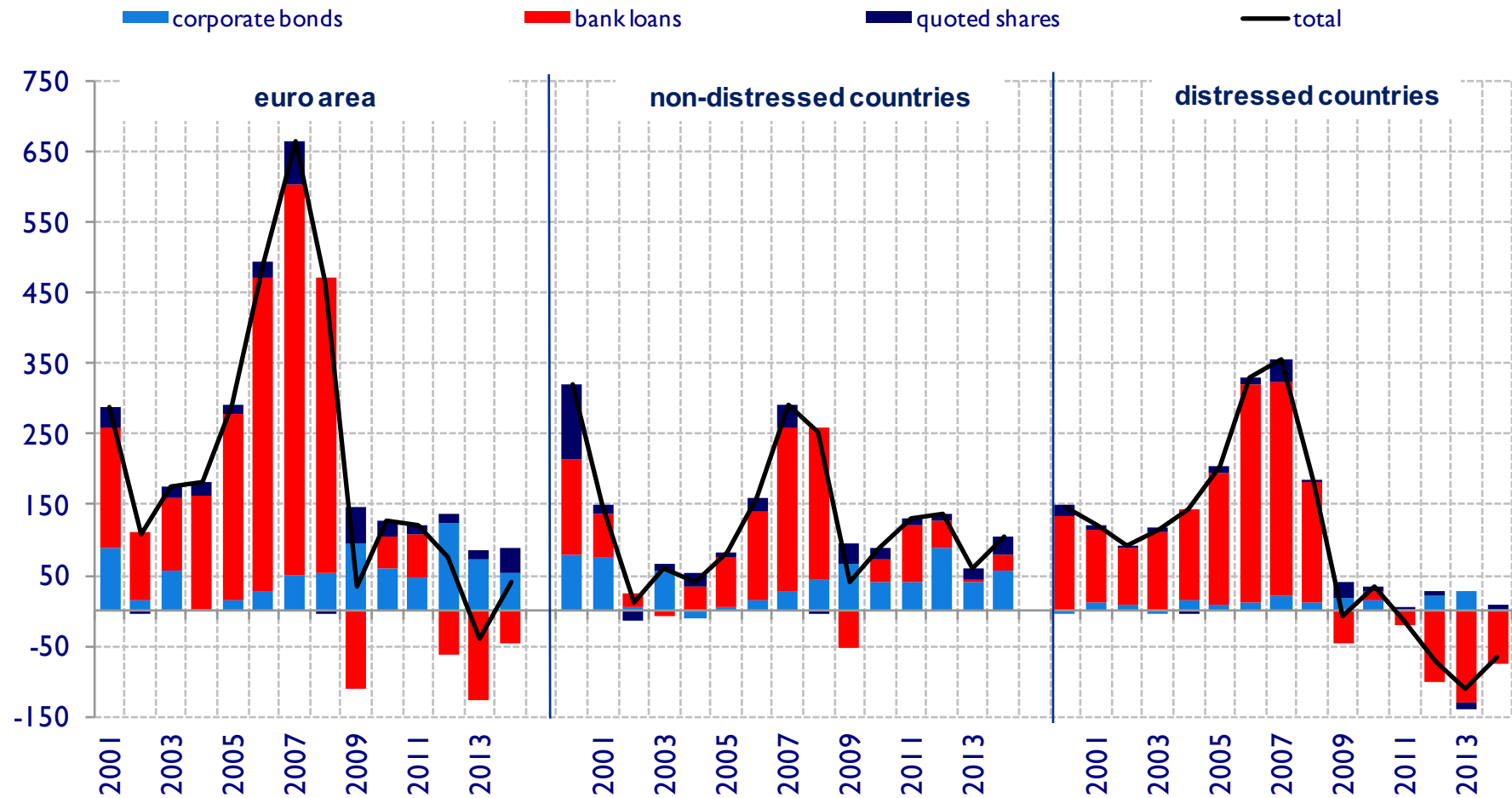
- We study the effects of the 2007-09 banking crisis on credit supply to businesses
- For identification, we use loan-level data for the entire Portuguese banking sector, matched with firm and bank balance sheets, and exploit the unexpected freeze of the European interbank market in August 2007
- Using difference-in-differences, we analyze lending before and after the crisis by banks with different susceptibility to the shock, based on their interbank exposure prior to the crisis
- We use firm fixed-effects to control for unobserved heterogeneity in firm fundamentals and risk (that proxy for loan demand)

RFS (2014) paper on credit supply and bonds: results

- For the *same* borrower, banks that rely more on interbank finance before the crisis decrease their lending more severely during the crisis
 - The credit supply reduction is stronger from riskier banks
 - Overall, we find limited positive impact of central bank liquidity assistance on credit supply, but banks with higher dependence on the interbank market hoard liquidity
 - The credit supply reduction is stronger for smaller, younger firms, with weaker banking relationships
- Importantly, we show that the firms cannot compensate the reduction in supply via obtaining credit from other, less affected, banks, nor from other sources of debt, including corporate debt and trade credit
 - No credit crunch for large firms
- Our results, therefore, suggest that the liquidity shock of the financial crisis of 2007- 09 affects entrepreneurial firms severely, while larger more established firms were less affected

Easier to substitute in core Europe (and US) rather than periphery?

Funding sources of non-financial corporations (EUR billions; annual sums). ECB graph



Let me now turn to US and to Germany for bank loans and corporate debt

US evidence: Becker and Ivashina (JME, 2014)

- They study firms' substitution between bank debt and non-bank debt (public bonds) using firm-level data
 - Any firm that raises new debt must have a positive demand for external funds. Conditional on issuance of new debt, they interpret firm's switching from loans to bonds as a contraction in bank-credit supply
- They find strong evidence of substitution from loans to bonds at times characterized by tight lending standards, depressed aggregate lending, high levels of non-performing loans and loan allowances, low bank share prices and tight monetary policy

Note: In this presentation I do not stress real effects on investment, employment or consumption but once it is easier to substitute finance, it is not difficult to show softer negative real effects

New evidence: Barbalau, Peydro and Ruggiero (2015)

- Compared to the previous paper, we introduce the main bank for each firm, characterize whether the main bank is weak or strong (based on e.g. bank NPLs), and also allow firms to issue in the same quarter both bonds and banks loans
- We find two new results:
 - Firms that rely on weaker banks when there are overall banking problems or tighter monetary policy substitute lower bank loans with higher corporate bond issuance
 - But the substitution with corporate bonds is not complete at all
- Results for US, but now working on European evidence

JFE (forthcoming) paper

- Let me now turn to the second message that I want to convey in this presentation
- In our JFE (forthcoming) paper, we analyze securities trading by banks (including corporate bonds) during the crisis and the associated spillovers to the supply of credit, including corporate issuance
- For identification, we use a proprietary dataset that has the investments of banks *at the security level* for 2005-2012 in conjunction with the credit register from Germany (i.e., both securities and credit registers)

Motivation

- The financial crisis has triggered a debate both in academic and policy circles about the implications of securities trading by banks.
 - During the crisis, banks may allocate funds to buy fire-sold securities to profit from trading opportunities, in turn reducing credit supply. While engaging in securities trading can be optimal from a bank's perspective, the need for regulatory intervention might arise due to negative externalities to the credit supply to the real sector
 - The externality stems from a temporary distortion in securities prices making it attractive for banks to increase investments in securities, thereby reducing credit supply, which affects borrowers unrelated to the original shock
 - Banks (due to their government guarantees) may take on high risk-taking via security trading
 - There have been recent policy initiatives on both sides of the Atlantic on limiting securities trading by banks: the Volcker rule in the US, the Liikanen Report in the EU, and the Vickers Report in the UK

Example from a policy maker

- *“Adverse spillovers from a fire sale of this sort may also take the form of a credit crunch that affects borrowers more generally. Such a credit crunch may arise as other financial intermediaries (e.g., banks) withdraw capital from lending, so as to exploit the now-more-attractive returns to buying up fire-sold assets. Ultimately, it is the risk of this credit contraction, and its implications for economic activity more broadly, that may be the most compelling basis for regulatory intervention”*

Jeremy C. Stein,
Governor of the Federal Reserve Board (2013)

Scant empirical evidence

- Empirical analysis has been elusive due to difficulty in obtaining detailed data on activities of banks in security markets
- Drechsler et al., (JF 2014): examine risk-shifting incentives of banks using sovereign collateral pledged to obtain funding at the ECB
 - But this only covers only a subset of the securities in a bank's portfolio (which they place as collateral)
 - Selection of banks that borrow more from the ECB
- Acharya and Steffen (JFE 2014): examine risk-shifting incentives of banks using data on sovereign securities from stress tests for Euro Area banks (few data points stemming from EBA stress tests)

Our paper

- Securities Register: detailed, proprietary supervisory dataset of the *investments* of banks in Germany at the *security-level* for the period 2005 – 2012 at quarterly frequency
 - Security: ratings, maturity, price, coupons, whether securities have a market price
 - Bank level variables: book equity, total assets profits, savings deposits, etc.
- Credit register: data on all individual loans made by banks. We also have the corporate debt issuance at the firm level
- We focus on:
 - Investments in debt securities (98% of investments)
 - Banks with assets over a billion euros
- We examine the investment and lending behavior banks during the crisis

Trading Banks

- We want to separate banks with higher trading expertise (trading banks)
- We proxy with bank membership to the largest fixed income trading platform in Germany (Eurex) for active presence and expertise in securities markets
 - Banks that engage in trading activities and have expertise will have a trading desk in place and the necessary infrastructure, such as direct membership to the trading platforms to facilitate trading activities
 - Securities bought and sold (as a fraction of total assets) are consistently larger for trading banks
 - Highly correlated with fraction of trading income to net income (correlation coefficient of 0.6)

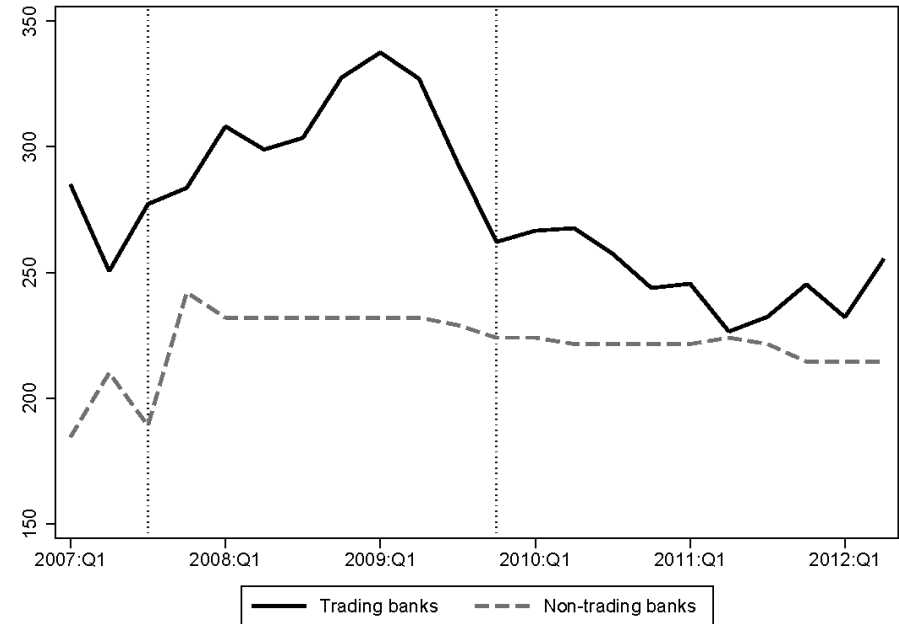
Results

- We find that – during the crisis – banks with higher trading expertise (trading banks) increase their investments in securities, especially in those that had a larger price drop, with the strongest impact in low-rated and long-term securities (12% average annual ex-post returns)

An example: 7-yr. JP Morgan Note



(a) Market price of 7-year JP Morgan note



(b) Security holdings of 7-year JP Morgan note

- Drop in price (from 100 to 85 Euro cents, s. left panel)
- German trading banks increase their investments of this note as long as the price continues to drop (s. right panel)

Results

- We find that – during the crisis – banks with higher trading expertise (trading banks) increase their investments in securities, especially in those that had a larger price drop, with the strongest impact in low-rated and long-term securities (12% average annual ex-post returns)
- Trading banks reduce their credit supply, and the credit crunch is binding at the firm level (that is, firms cannot substitute with other banks or corporate debt issuance)
 - All of the effects are more pronounced for trading banks with higher capital levels
- Banks use central bank liquidity and government subsidies like public recapitalization and implicit guarantees mainly to support trading of securities
- Overall, our results suggest an externality arising from fire sales in securities markets on credit supply via the trading behavior of banks

Summary

1. A more diversified financial system, including deep capital markets in addition to banks, would reduce the negative real effects that banking crises bring for the overall economy
 - I present some evidence from US, Germany, Portugal and Spain
2. Banks that trade on fixed income securities may reduce the supply of credit to the real sector in financial crises, as it may be more profitable for banks to hoard liquidity and then buy securities when there are high fire sales of securities and sell them when fire sales disappear
 - I present evidence for Germany where banks obtain 12% ex-post returns in security trading in 2008-09 rather than 5% of loan rates at that time

Note: I do not stress in this presentation the good times, but only financial crises, though financial crises are generated after large leverage booms, see Freixas, Laeven and Peydró (*MIT Press*, 2015)

Thank you!