

# The danger of not seeing the trees for the forest. Why microdata is essential for a comprehensive analysis of financial stability.

Pirmin Fessler & Esther Segalla <sup>1</sup>

(OeNB)

Workshop

18.09.2014

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<sup>1</sup> Opinions expressed by the authors of studies do not necessarily reflect the official viewpoint of the Oesterreichische Nationalbank or of the Eurosystem.

# Outline

- 1 Financial Stability: The Big Picture
- 2 Missing the Trees for the Forest
- 3 Households
- 4 Firms
- 5 Banks
- 6 Banks, Firms, and Households

# FINANCIAL STABILITY

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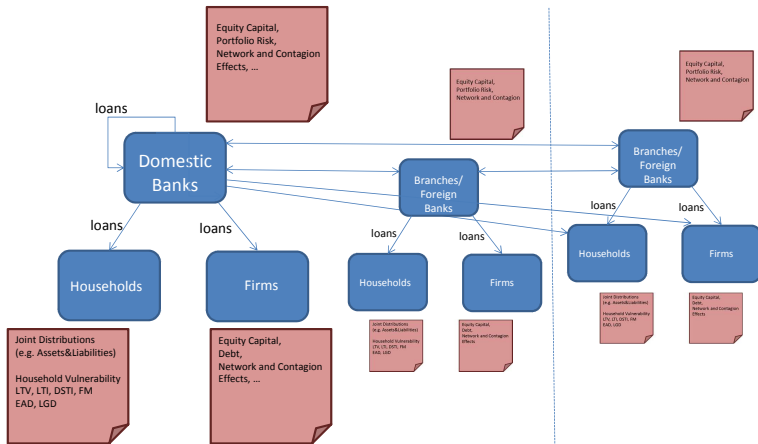
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- ③ Addressing Inevitable Uncertainty
  - ▶ ...benefits and costs of additional uncertainty (translated to risk)
  - ▶ ...benefits and costs of regulation
  - ▶ ...plans for burden sharing in case of crisis

# Banks, Firms and Households

## Austria

## Foreign Countries



# MISSING THE TREES FOR THE FOREST. BANKS.

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*What happened? A large variety of things possible...*

—→ Fortunately, nobody would assess risks in the banking sector by only observing aggregates of the sector as a whole.

# MISSING THE TREES FOR THE FOREST. HOUSEHOLDS.

## Example

*Household A 20% equity capital when buying main residence; Household B 80% equity capital when buying main residence; value of main residence equal*

*→ Aggregate: Loan to Value Ratio of 0.5*

*Shock: 40% on house prices*

*→ Investigating Aggregate: no problem (for banks). Loan to Value Ratio at 0.8*

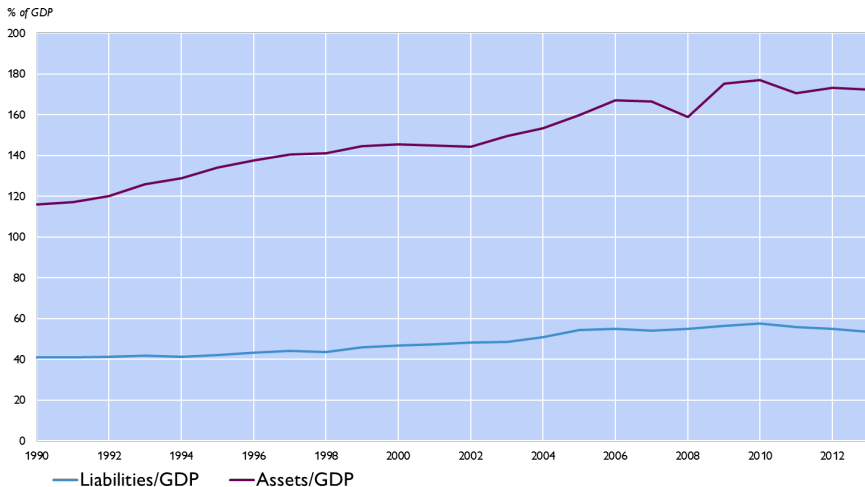
*→ Investigating Micro-Level: household A “under water”. After selling Collateral 20% of the credit irrecoverable. Household B 30% Loan to Value Ratio.*

→ Up to date hardly any micro-measures/micro-data available to assess risks seriously.

Fast growing field. [▶ More](#)

# Not only a theoretical problem: Aggregates

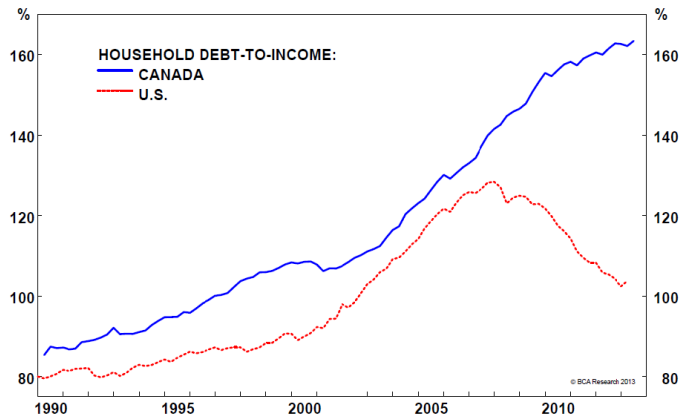
## Financial Assets and Liabilities of the Household Sector



Source: OeNB.



# Not only a theoretical Problem: An Illustration



▶ More

# BANKS - TWO CENTRAL PERSPECTIVES

## ① Risk Monitoring of Financial System

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- ▶ ...borrowers perspective: joint distribution of assets and liabilities of households and firms
- ▶ ...regional and transnational network of banks and branches
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## ② Burden sharing in case of rescue/default

- ▶ ...partial (default) versus rescue
- ▶ ...distributional impact of bank rescue packages and (fiscal but also) monetary policy
- ▶ ...tax payers, bond holders, equity holders,...
- ▶ ...financing via debt, taxes, inflation,...

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→ Aggregates can not tell us much about Risk and Financial Stability

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  - Systemic risk buffer, anticyclical buffer, capital conservation buffer
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→ Need for detailed microdata analysis to understand who is affected how and to what extend.

## ① Mandatory Data:

- ▶ Credit Register Data (e.g. creditlevel, loans>350,000 Euro):  
Banks, Firms, Persons, Public Entities
- ▶ Balance sheet data: Banks, Firms;
- ▶ General information (small set of variables): Banks, Firms, Persons,  
Public Entity

## ② Survey

- ▶ Household balance sheet and consumption (HFCS)
- ▶ Euroization in Eastern Europe: Households, Persons (OeNB  
Eurosurvey)
- ▶ Income and consumption: Households (Consumer Survey)

## ① Register

- Main Advantages
  - ★ Precision
  - ★ Completeness
- Main Disadvantages
  - ★ Target Populations
  - ★ Not collected for large scale microdata analysis

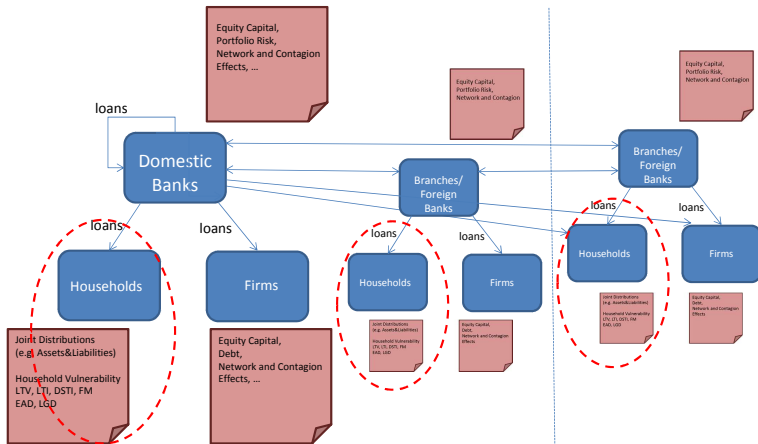
## ② Survey

- Main Advantages
  - ★ Many important covariates
  - ★ Collected for statistical reasons
  - ★ Reasonable Target Populations
- Main Disadvantages
  - ★ Measurement Problems, Non Response etc.
  - ★ Sample Size for Subgroups
  - ★ Difficult to match

# Banks, Firms and Households

## Austria

## Foreign Countries



# Households balance sheets

Table 2

## Subcomponents of Net Wealth

	Participation	Median	Mean	Mean-to- median ratio
	%	EUR		
<b>Real assets</b>				
vehicles	74.9	8,000	13,088	1.6
main residence	47.7	200,000	258,072	1.3
other valuables	23.6	3,909	12,835	3.3
other real estate property	13.4	94,028	227,929	2.4
investment in self-employed businesses (incl. farms)	9.4	180,603	731,425	4.0
<b>Financial assets</b>				
sight accounts	99.0	707	3,171	4.5
savings accounts	87.1	11,657	30,062	2.6
savings plans with building and loan associations	54.7	3,414	5,291	1.5
life insurance contracts	38.0	11,137	26,922	2.4
money owed to household	10.3	2,620	15,754	6.0
mutual funds	10.0	11,248	55,414	4.9
stocks	5.3	7,086	26,864	3.8
bonds	3.5	13,832	102,860	7.4
other financial assets	2.3	4,722	45,846	9.7
<b>Debt</b>				
collateralized debt	18.4	37,546	76,288	2.0
main residence	16.6	37,332	72,745	1.9
other real estate property	2.4	36,397	80,204	2.2
uncollateralized debt	21.4	3,016	12,687	4.2
overdrafts	13.6	1,208	2,349	1.9
uncollateralized loan	11.1	8,000	21,475	2.7
outstanding balance on credit cards	1.5	540	966	1.8

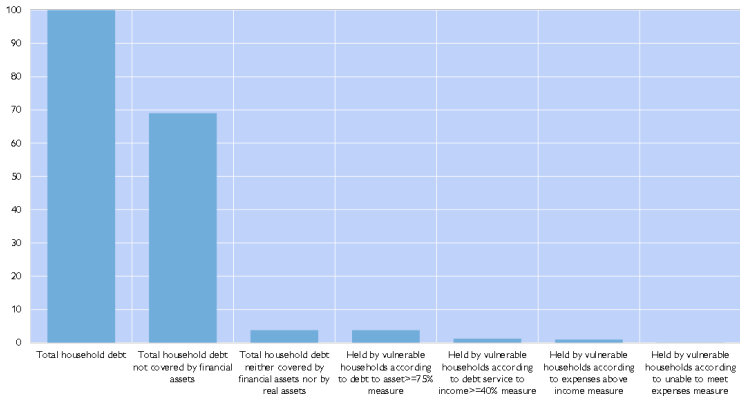
Source: HFCS Austria 2010, OeNB.

# Household debt: Covered by ... Assets

Chart 1

## Indebtedness and its coverage by wealth

in % of total household debt

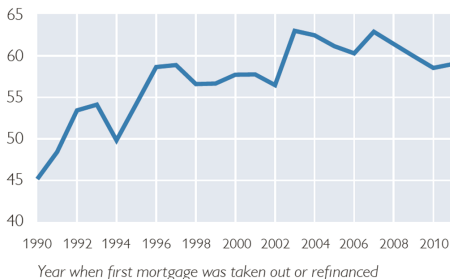


Source: HFCS 2010, OeNB.

# Initial LTVs over time

## Development of the Median Initial LTV Ratio during the Past Decades

Eight-year moving average in %

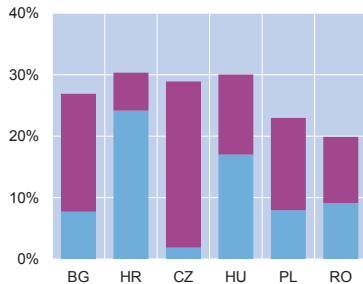


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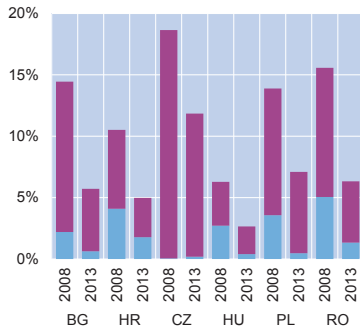
More on household vulnerability by: Miguel, Petr, Daniela, and Helge

# FX Loans OeNB Euro Survey

Do you have a loan?



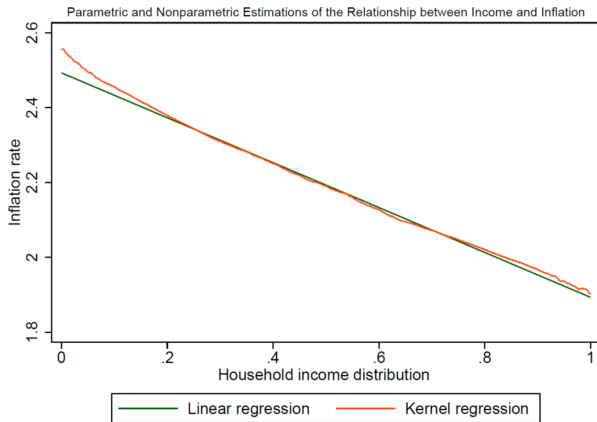
Do you plan to apply for a loan?



■ Yes, in Foreign Currency. ■ Yes, in Local Currency.

Source: OeNB Euro Survey, 2008-2013.

# Micro-Level Heterogeneity in Inflation

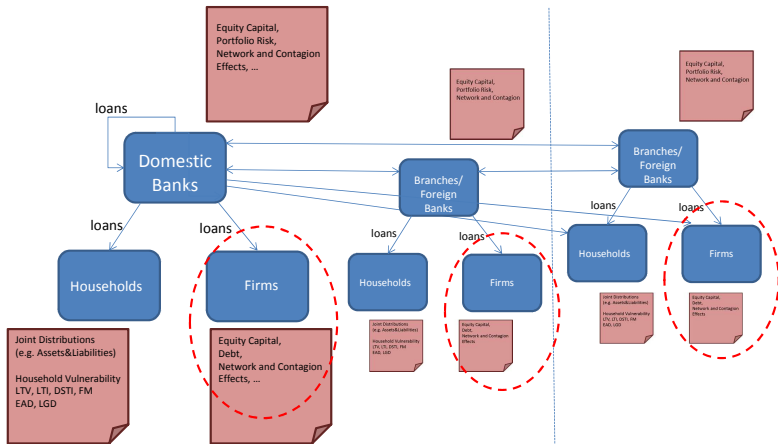


The more household income, the lower the inflation rate (2010-2012)

# Banks, Firms and Households

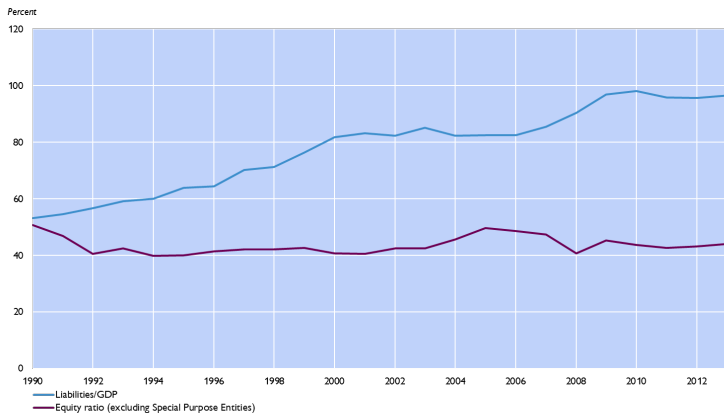
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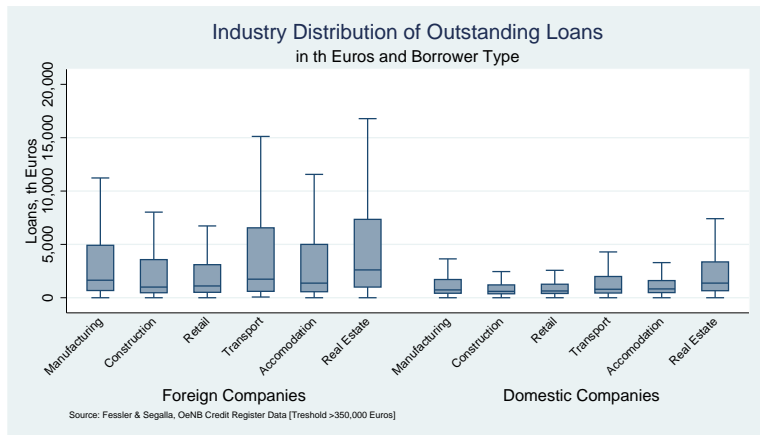
# Banks, **Firms** and Households

## Liabilities and Equity Capital of Nonfinancial Corporations



Source: OeNB, OeKB, 1990-1994 partly estimated

# Banks, Firms and Households

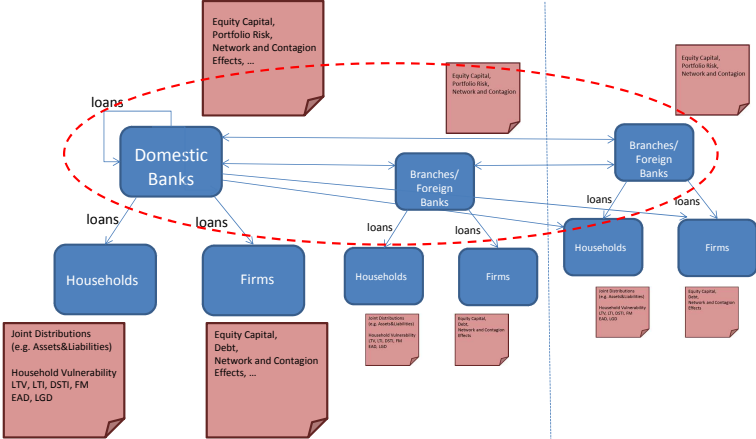


More on corporate loans and bank specialization by: Thorsten

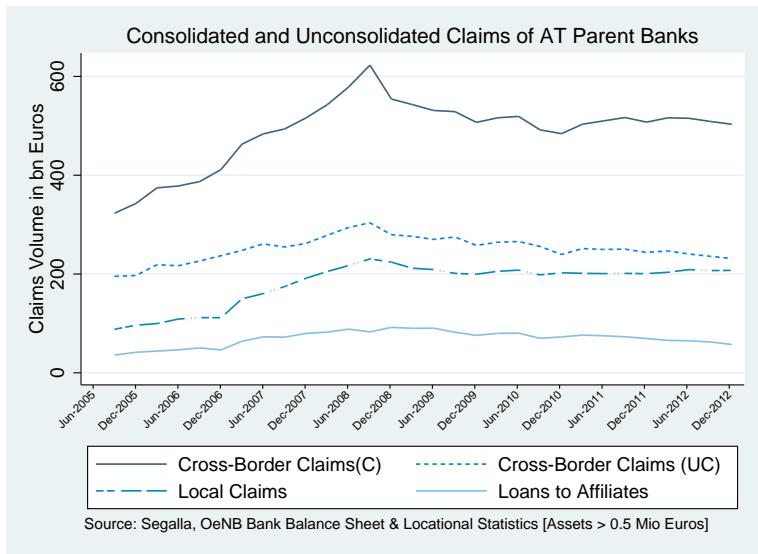
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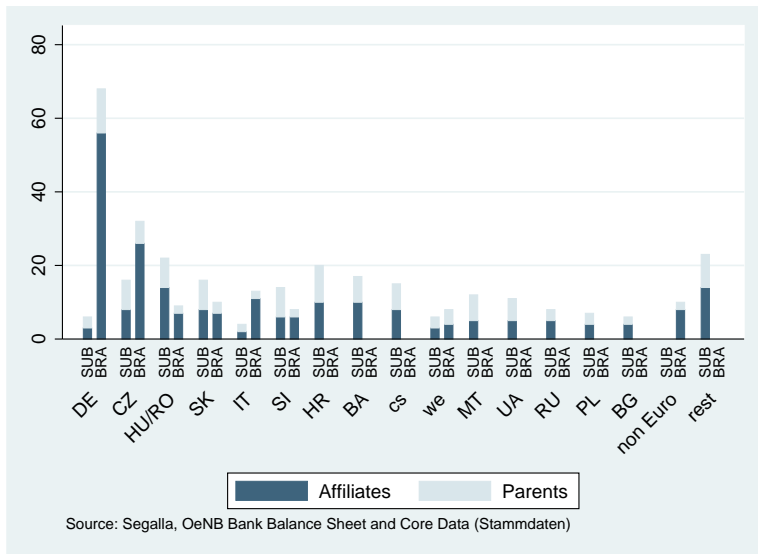
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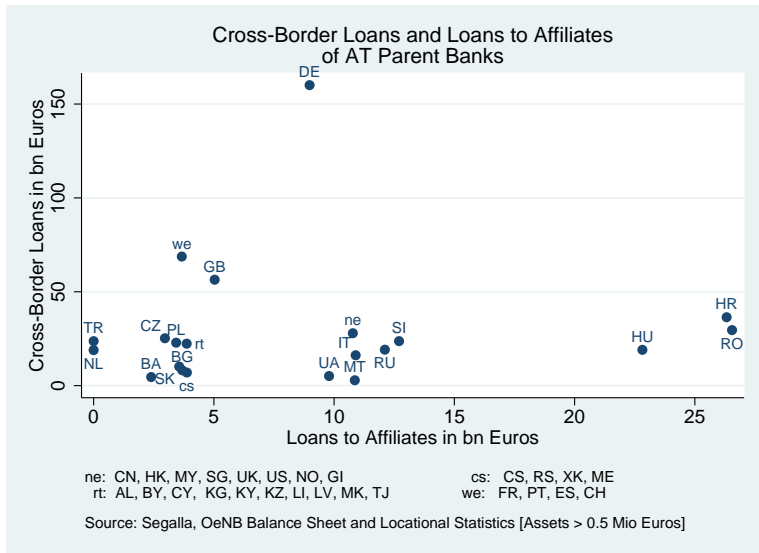
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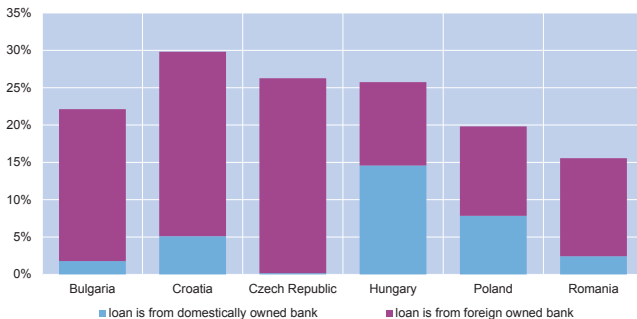


# Banks, Firms and Households



# Banks and Households: OeNB Euro Survey

## Loans and Bank Ownership



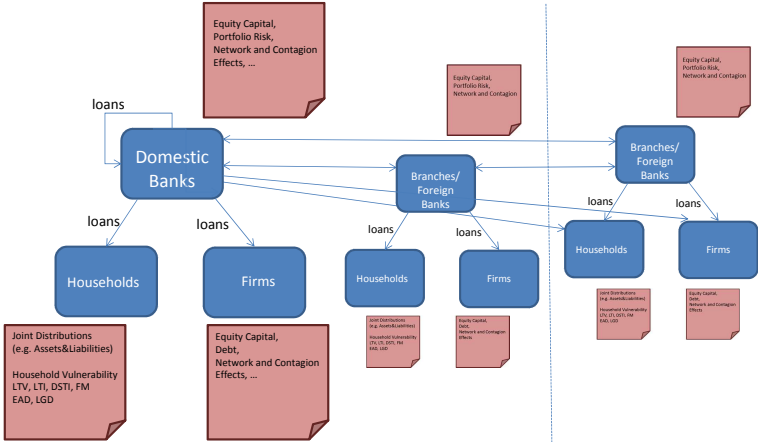
Source: OeNB Euro Survey & BankScope.

More analysis on the country variation in the loan dimension by: Ibolya (graciously stepping in for Hans)

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# Banks, Firms and Households

Figure: Credit Level Data (Loans>350,000 Euro):

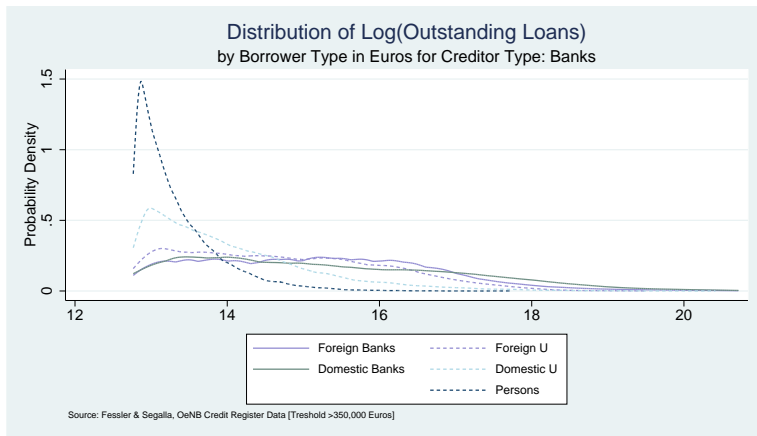
	No. of loans	Median (EUR th)	Mean (EURO th)	Mean/Median	Share of loans (%)	Total (EUR billion)	Share of Volume (%)
Foreign (Bank, FI)	9,896	3,899	20,242	5.2	8.6	200	29.6
Foreign Company	11,585	1,952	5,910	3.0	10.1	68	10.1
Bank, FI	6,336	3,067	35,966	11.7	5.5	228	33.7
Company	54,903	802	2,837	3.5	47.6	156	23.0
Person	32,537	492	722	1.5	28.2	23	3.5
Total	115,257					676	

- Close to full loan volume to companies covered
- About 18% of loan volume to households covered, and about 25% with regard to mortgage loans
- 350,000 threshold crossed at P98 of HFCS mortgage loans, so roughly 12,000 such loans covered, but in lower area (largest about 700,000)

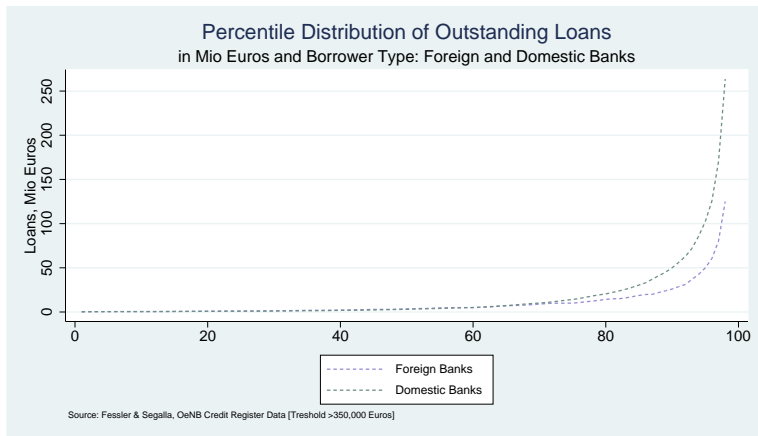
More analysis based on credit register data by: Margherita and Mauro



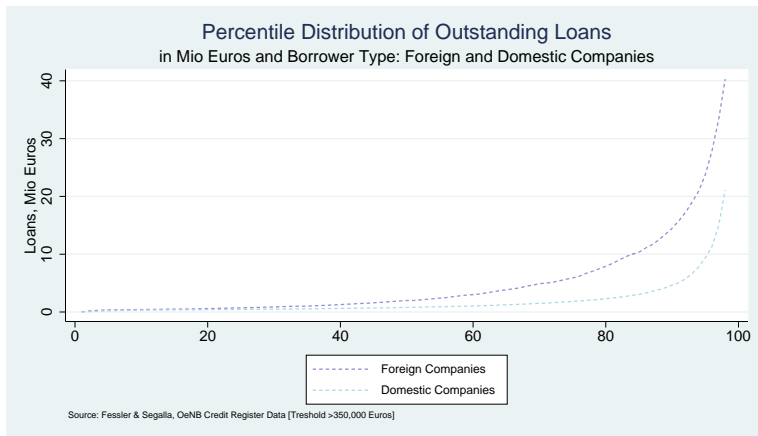
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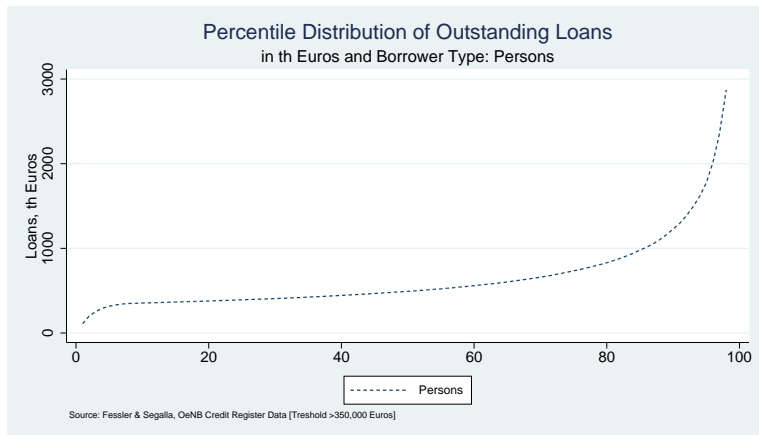
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# Conclusions

- Analysing microdata is necessary to better understand the financial system and possible threats to financial stability
- Microdata can help which macroprudential tool to choose and evaluating/simulating its impact on different levels
- Combining information on different units like banks, firms, households, persons is crucial to identify risks
- Data sources available are (originally) collected for different purposes but might all help to improve financial stability analyses
- Effort to increase transparency, usability and comparability/linkability of different data sources is crucial to tap the full potential of the data

More on linking Survey to bank-level data by: Evren and Ulf

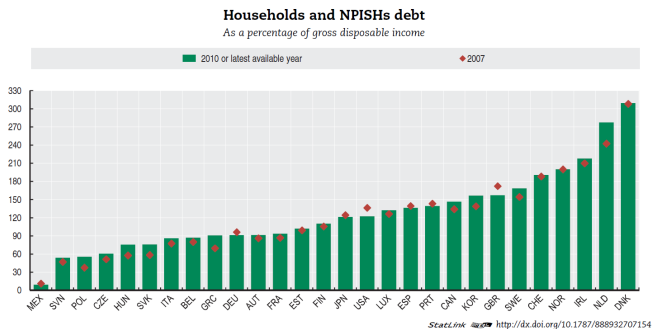
## EXAMPLE

Table: Beispiel LTV

	Debt	Housing value	LTV
Household A	80	100	0,8
Household B	20	100	0,2
Aggregate	100	200	0,5
Post Schock			
Household A	80	60	under water <sup>1</sup>
Household B	20	60	0,3
Aggregate	100	120	0,8

Note:<sup>1</sup> 20% of former housing value [▶ Back](#)

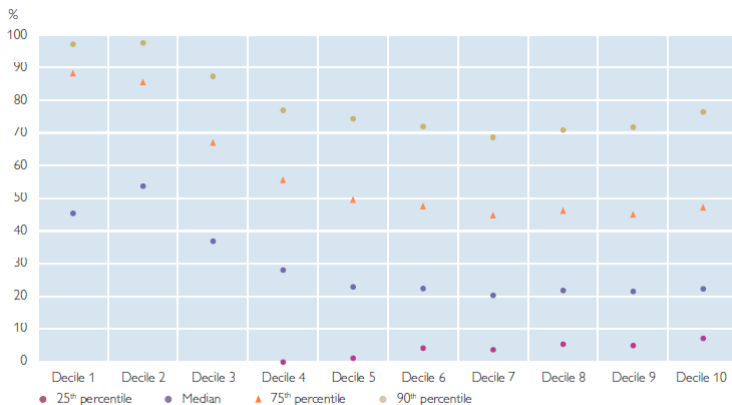
# Not only a theoretical Problem: Debt to Income



▶ Back

# Banks, Firms and Households

## Limited Liability Companies' Equity Ratios by Total Asset Deciles



Source: OeNB.

Note: The 10<sup>th</sup> percentile is negative in all deciles, the 25<sup>th</sup> percentile is negative in the lowest three deciles.