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FINANCIAL SOUNDNESS OF LITHUANIAN HOUSEHOLDS AND THE STABILITY OF THE FINANCIAL SECTOR

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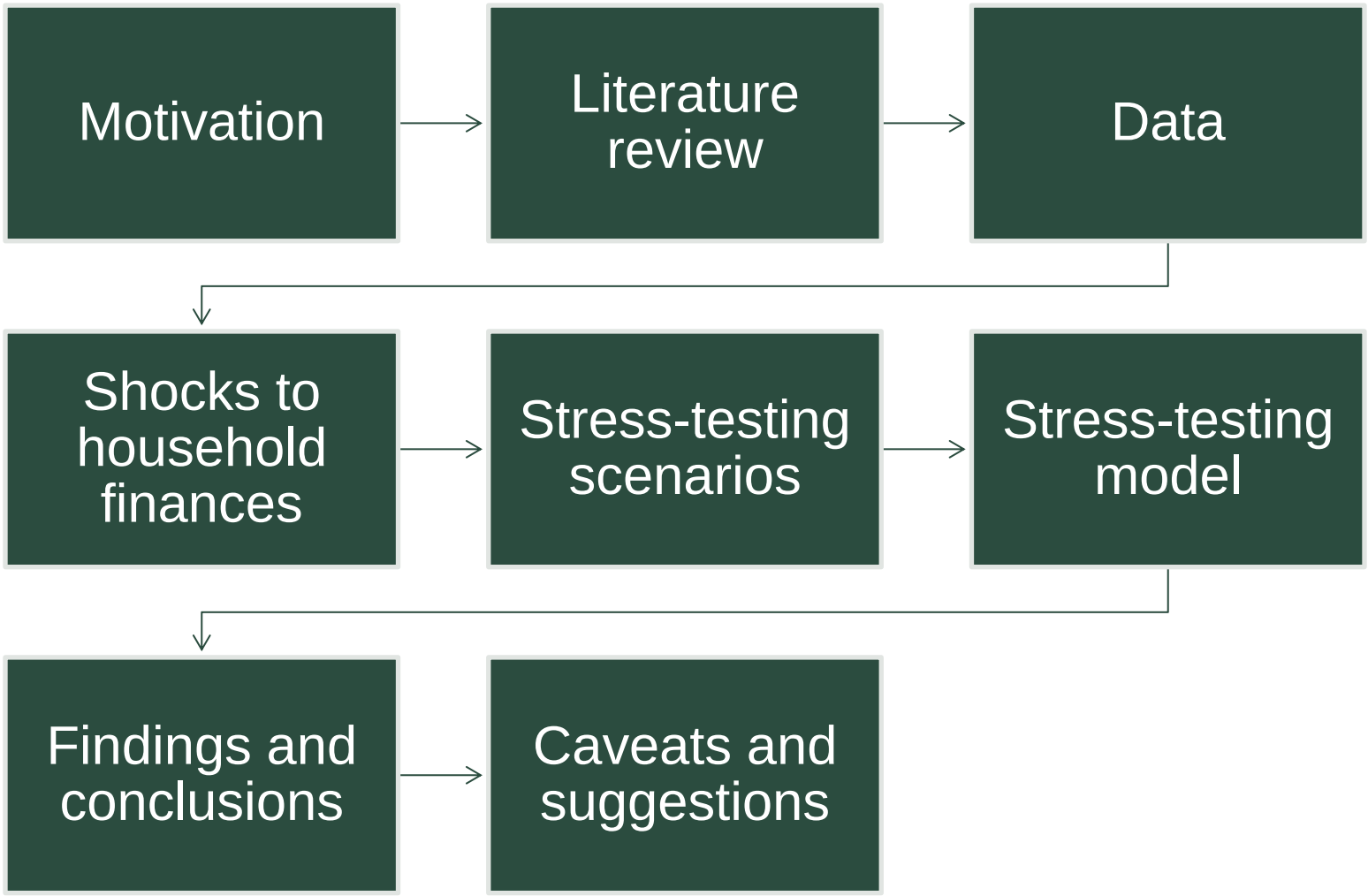
**The opinions expressed in this presentation are the authors' own and do not necessarily reflect the view of the Bank of Lithuania.*

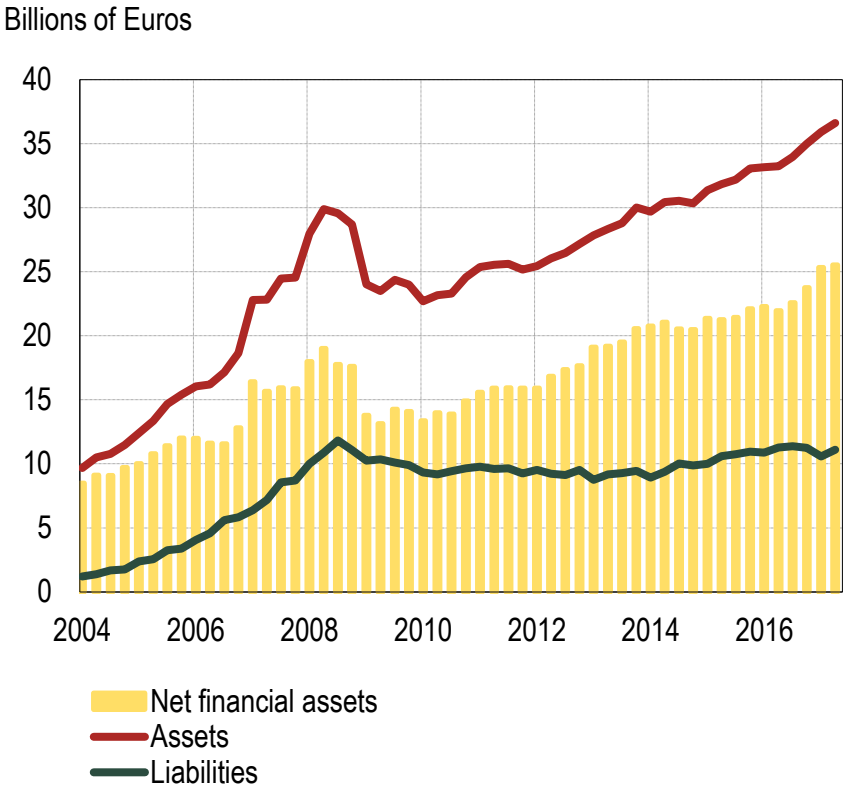
Presentation outline



Motivation

- Rapid growth of household credit prior to the recession of 2008
- To determine the consequences of possible deterioration of households' financial situation to the performance results of credit institutions
- To identify to which household financial problems banks are the most sensitive
- To provide a framework for macroprudential policy tools assessment

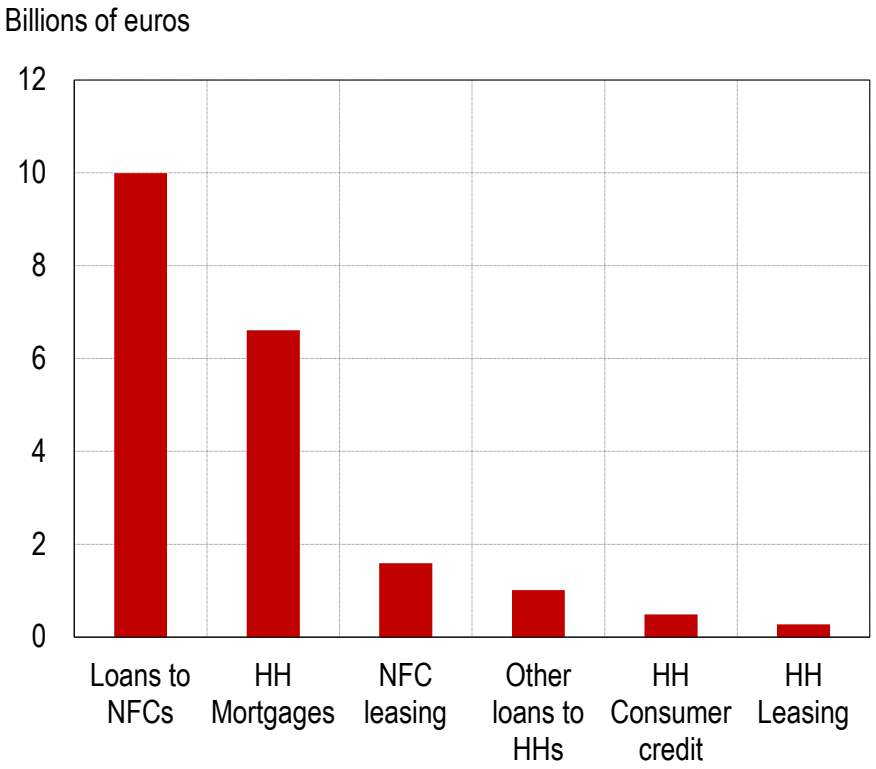
Lithuanian households' financial assets and liabilities



Source: Bank of Lithuania.

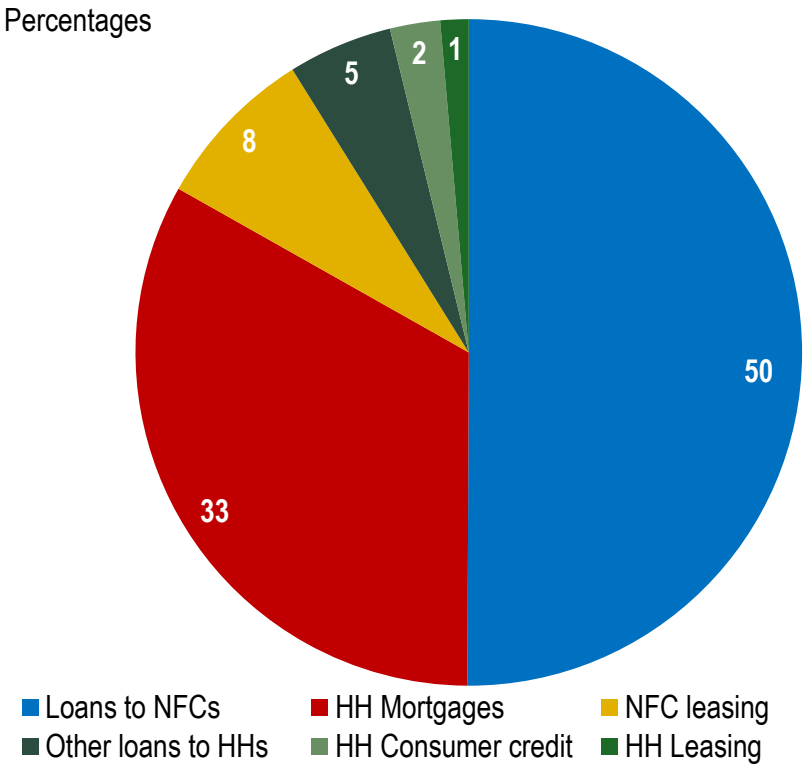
Lithuanian banking market by segments

Bank loans by type and amount



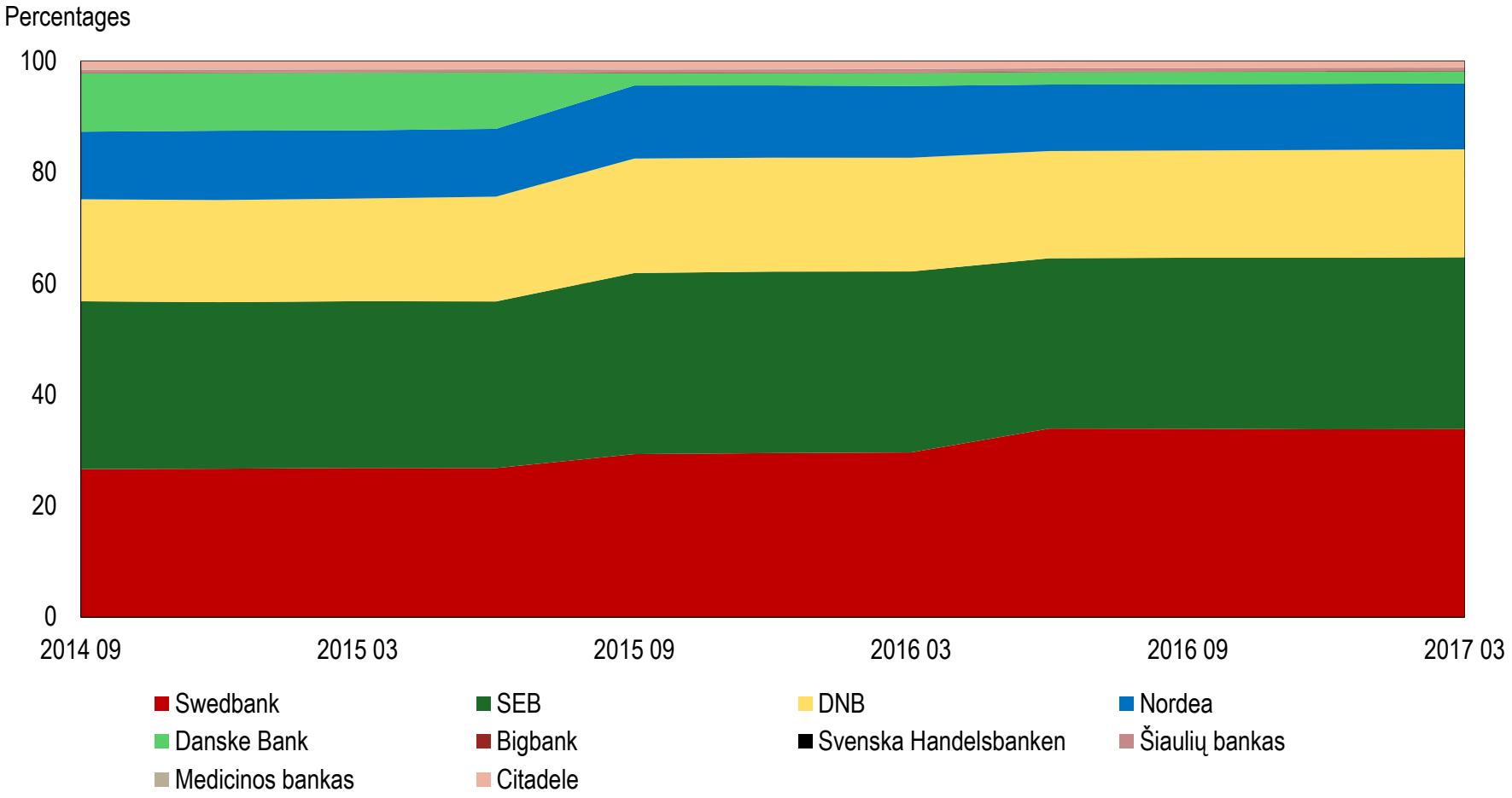
Source: Association of Lithuanian Banks.

Structure of bank loans portfolio by loan type



Source: Association of Lithuanian Banks.

Loans for house purchase are especially important for large banks



Source: Bank of Lithuania.

Literature review

- **Researches on household indebtedness conducted in Sweden, Norway and Chile:**
  - Johansson and Persson (2006)
  - Vatne (2006)
  - Fuenzalida and Ruiz-Tagle (2009)

- **World bank study on the impact of shocks in credit availability, income, food and fuel prices to households from European and Central Asian countries**
  - Tiongson et al. (2010)

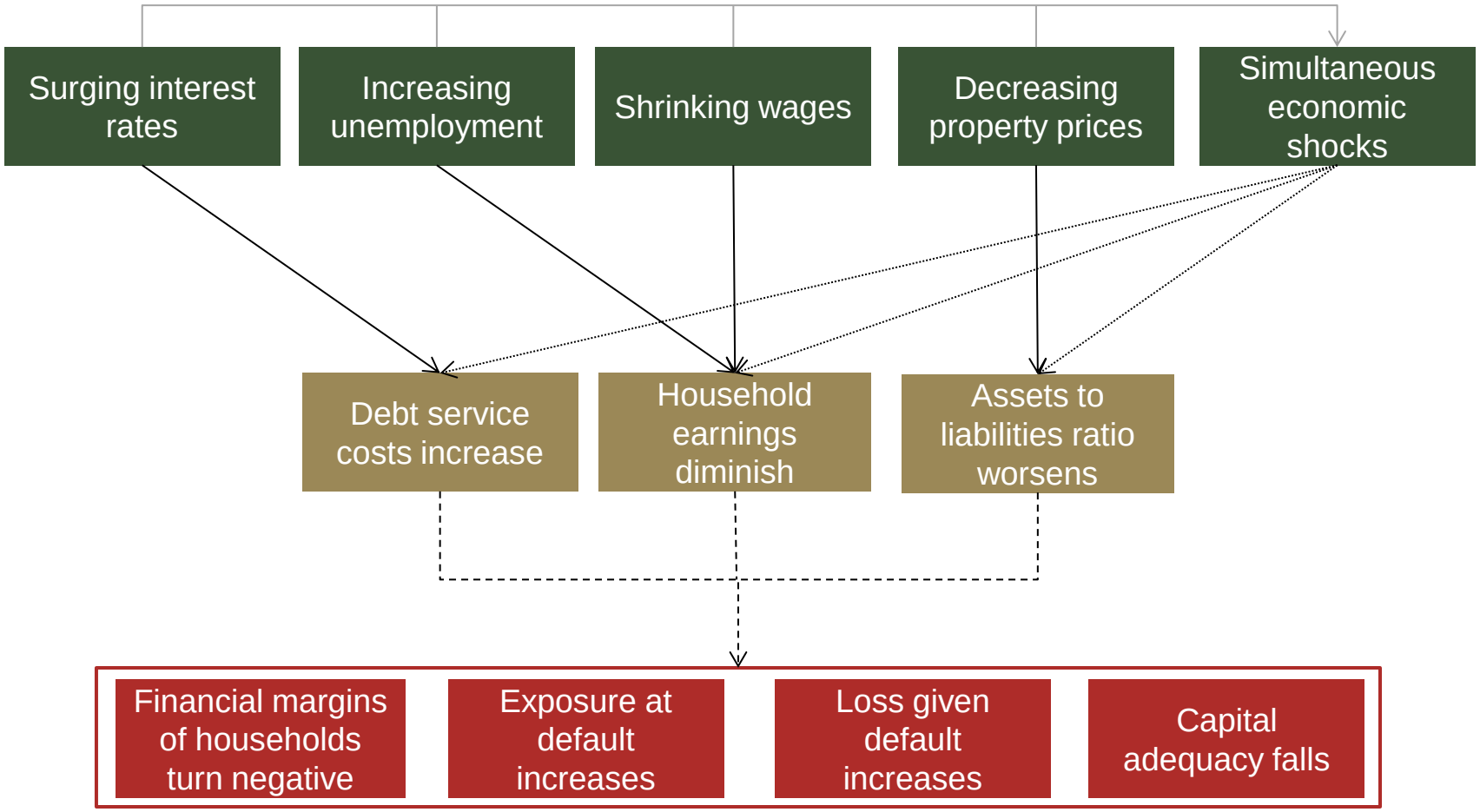
Data

- Micro data of households‘ obtained from Household Financial Monitoring Information System – a micro data set (or credit registry) operated by the Bank of Lithuania

- Variables used for stress-testing shocks evaluation:

  – short term interbank interest rates (6m Euribor rate) (*Source: ECB*)
  – mortgage interest rate statistics (*Source: Bank of Lithuania*)
  – unemployment rate (*Source: Statistics Lithuania*)
  – net wages (*Source: Statistics Lithuania*)
  – real estate price indices (*Source: Statistics Lithuania*)

Expected shocks to household finances



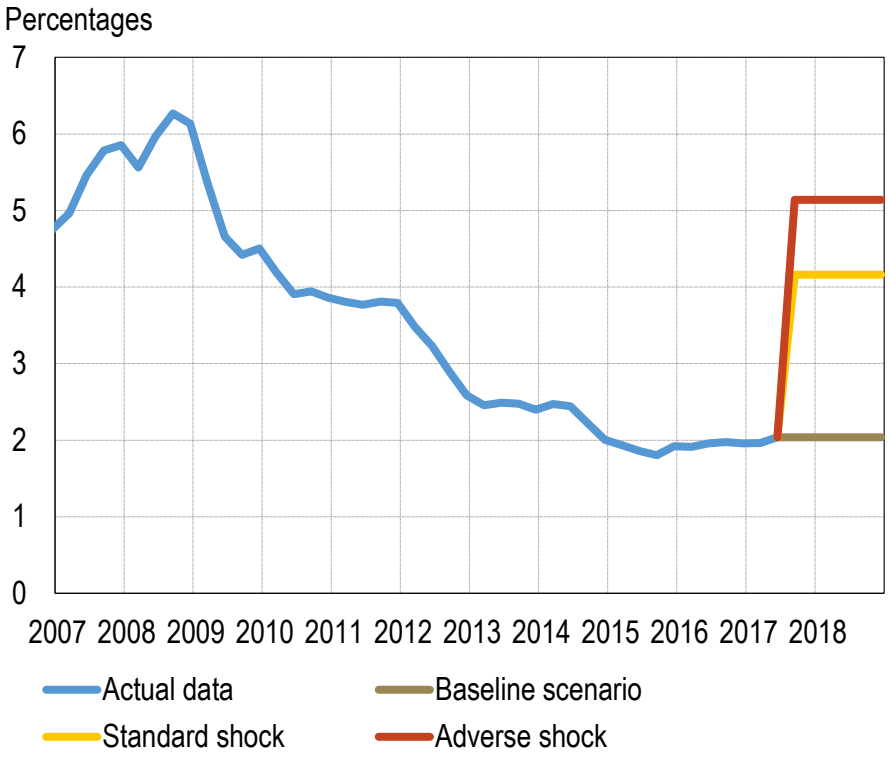
Stress-testing scenarios (1)

- **Strength of the shocks is determined by standard deviation multiples (for standard shocks) or repeating a crisis of 2008 scenario (adverse shocks except for wages)**

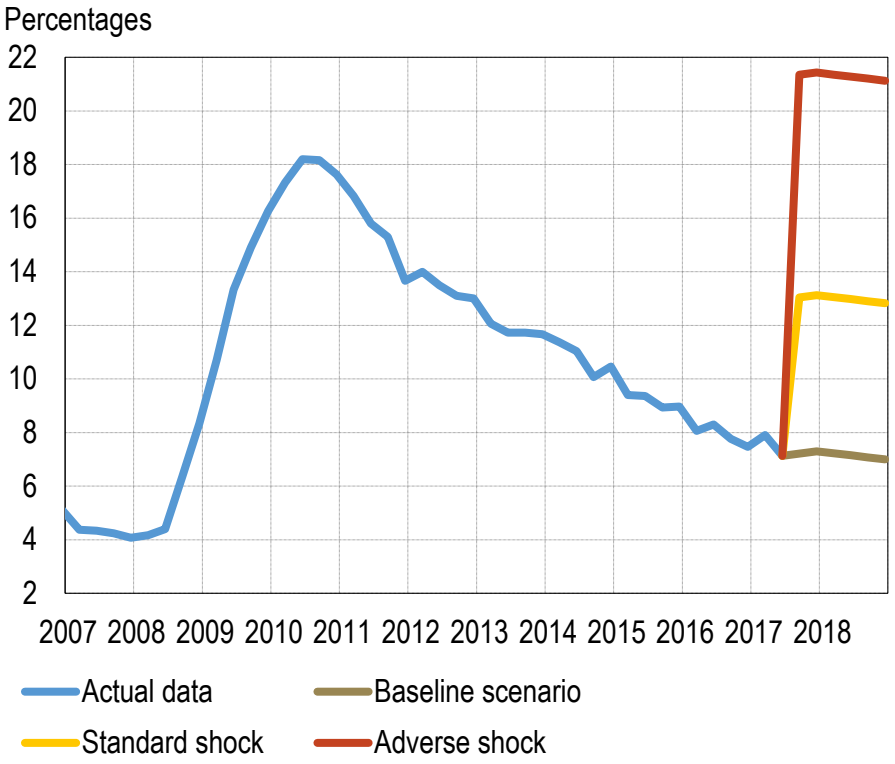
Scenario	Standard shock	Adverse shock
Increase in unemployment rate	5.8	14.1
Increase in interest rate	2.1	3.1
Decrease in earnings	16.3	24.4
Decrease in housing prices	19.4	40.7

Stress-testing scenarios (2)

Average interest rate dynamics of newly issued mortgage flow prior to and after the shocks

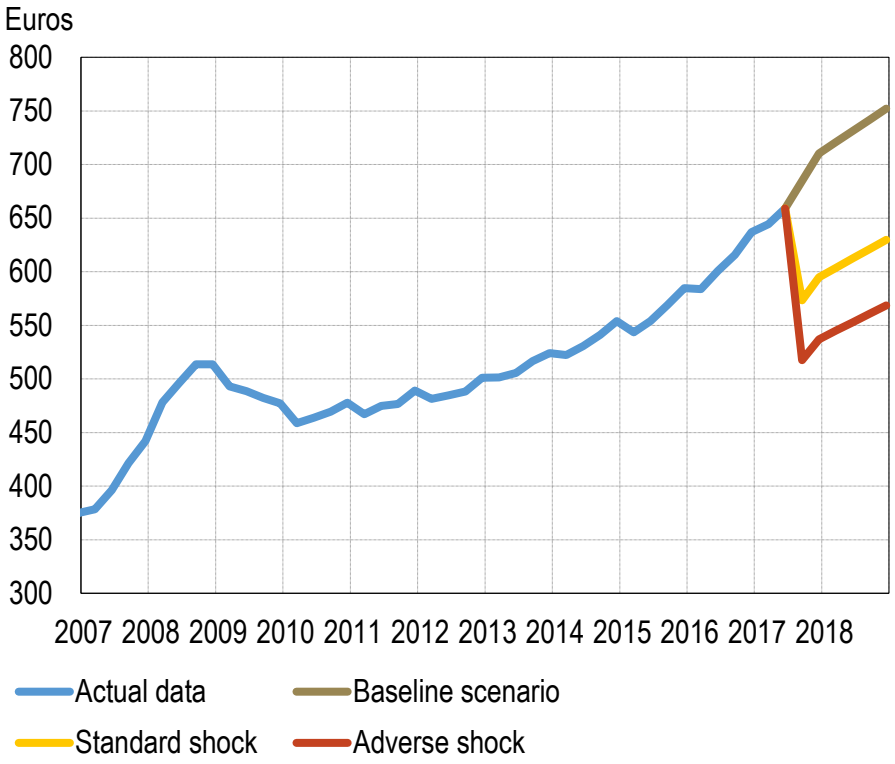


Unemployment rate dynamics prior to and after the shocks

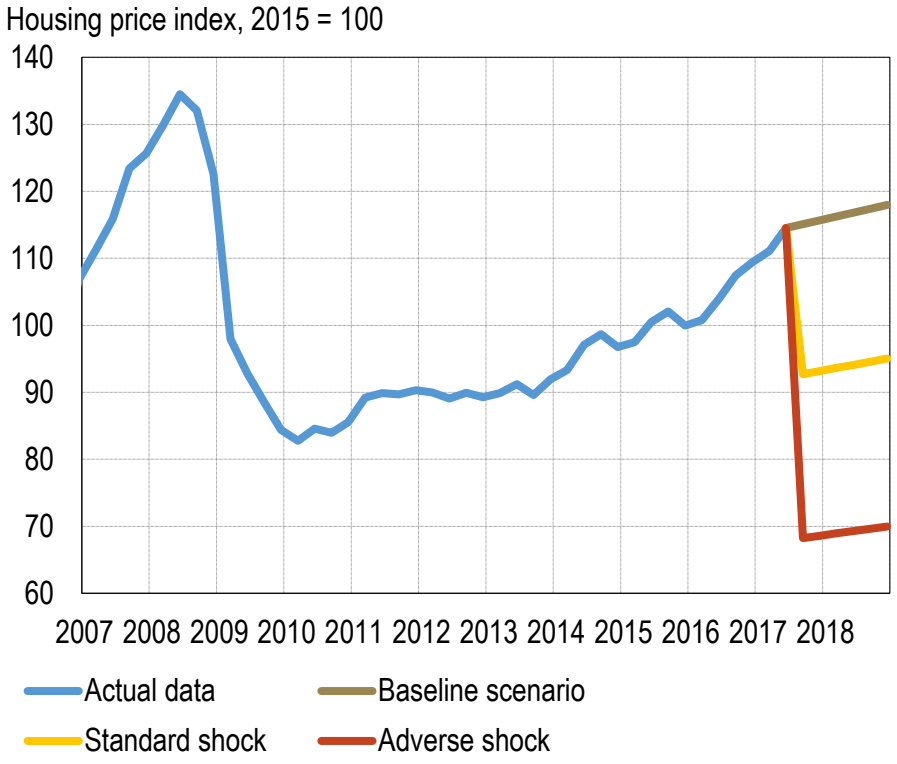


Stress-testing scenarios (3)

Average net monthly wage dynamics prior to and after the shocks



Housing price dynamics prior to and after the shocks



Stress-testing model

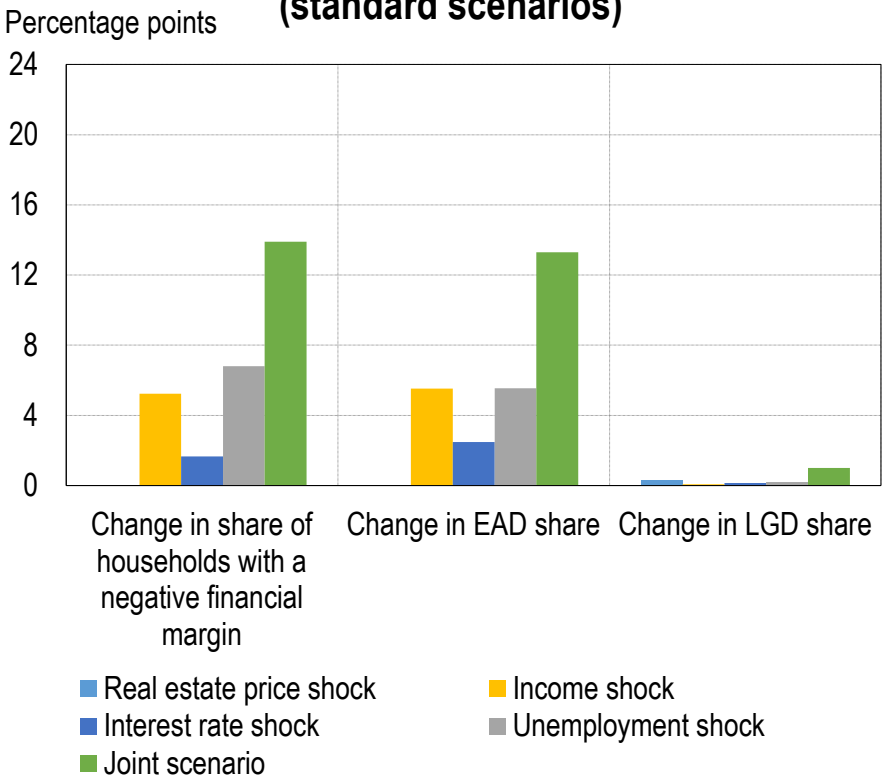
- **Stress-testing model**
  - Influence of every shock to the financial situation of households is assessed
  - A rise in unemployment is simulated using *Monte Carlo* method which allows to assign the same probability of losing a job for every member of a household that has a job
  - *Monte Carlo* method is also used for the simulation of joint scenario results
  - Household margin:
    - $M_i = D_i - CL_i - CF_i - CI_i$
      - M_i – households' margin; D_i – disposable income; CL_i – living costs; CF_i – expenditure to pay back financial obligations; CI_i – interest expenditure
  - Expected losses:
    - $EL = \sum_{i=1}^{N} \left[I_i^M \times (-NW_i) \right]$
      - EL – expected losses of mortgage loans portfolio; I^M – household margin indicator, equal to equal to 1 (0) if the margin is negative (positive) and the value of pledged real estate is lower (higher) than remaining balance of a mortgage; NW – net wealth of a household.

Assumptions of the stress-testing model

- If expenses of debt balance and interest payments are not reported in full or debt repayment costs are unsustainably high, it is assumed that a mortgage will be repaid in 25 years, other loans – in 5 years
- Necessary expenses of households are not differentiated according to their living location
- Living costs are derived by expert judgement (2X poverty burden per person in multiple persons' household and 3X poverty burden for a single person households)
- Shocks to households are transmitted immediately
- Household can not change the terms of the loan (currency, repayment period, bank's margin)
- Member of a household who lost a job gets an unemployment benefit described by a formula 114 + 0.3×W, where W is an average monthly gross salary of unemployed person in the last 12 months; the benefit can not exceed 75 per cent of an average monthly gross wage (that was 830 euros as of Q2 2017)
- All assets of a household is the real estate pledged as mortgage collateral
- Capital losses are distributed among banks proportionally to their mortgage portfolios
- Foreign bank branches are excluded from distribution of losses as they do not have capital (however, these banks also extend mortgages)

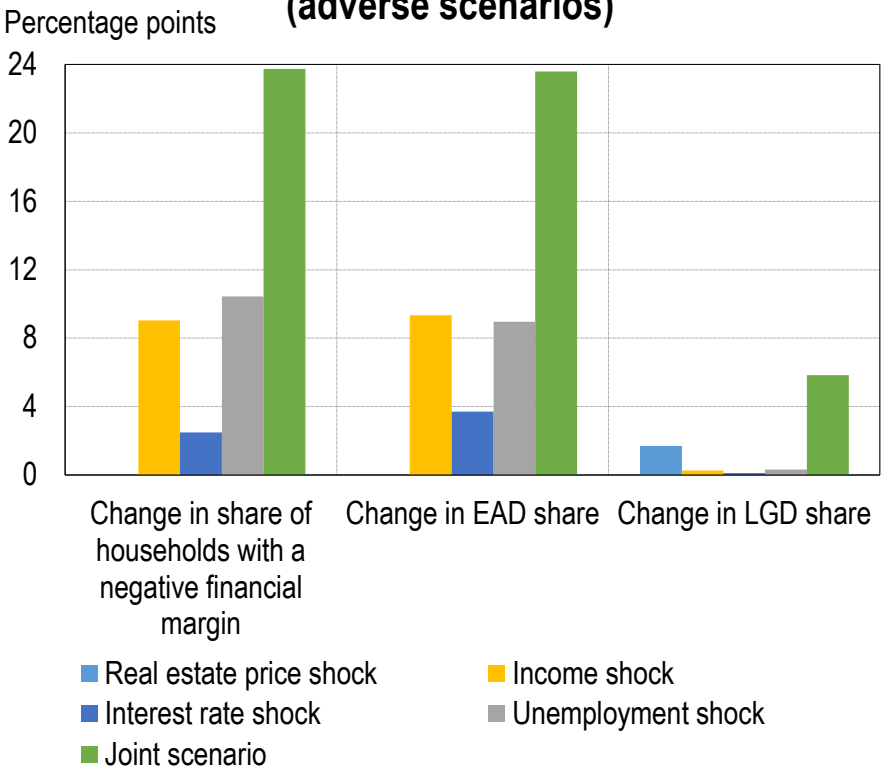
Findings and conclusions (1)

Evaluation of various shocks' impact on households' financial situation and stability (standard scenarios)



Source: authors' diagram and calculations; results of simulation data.

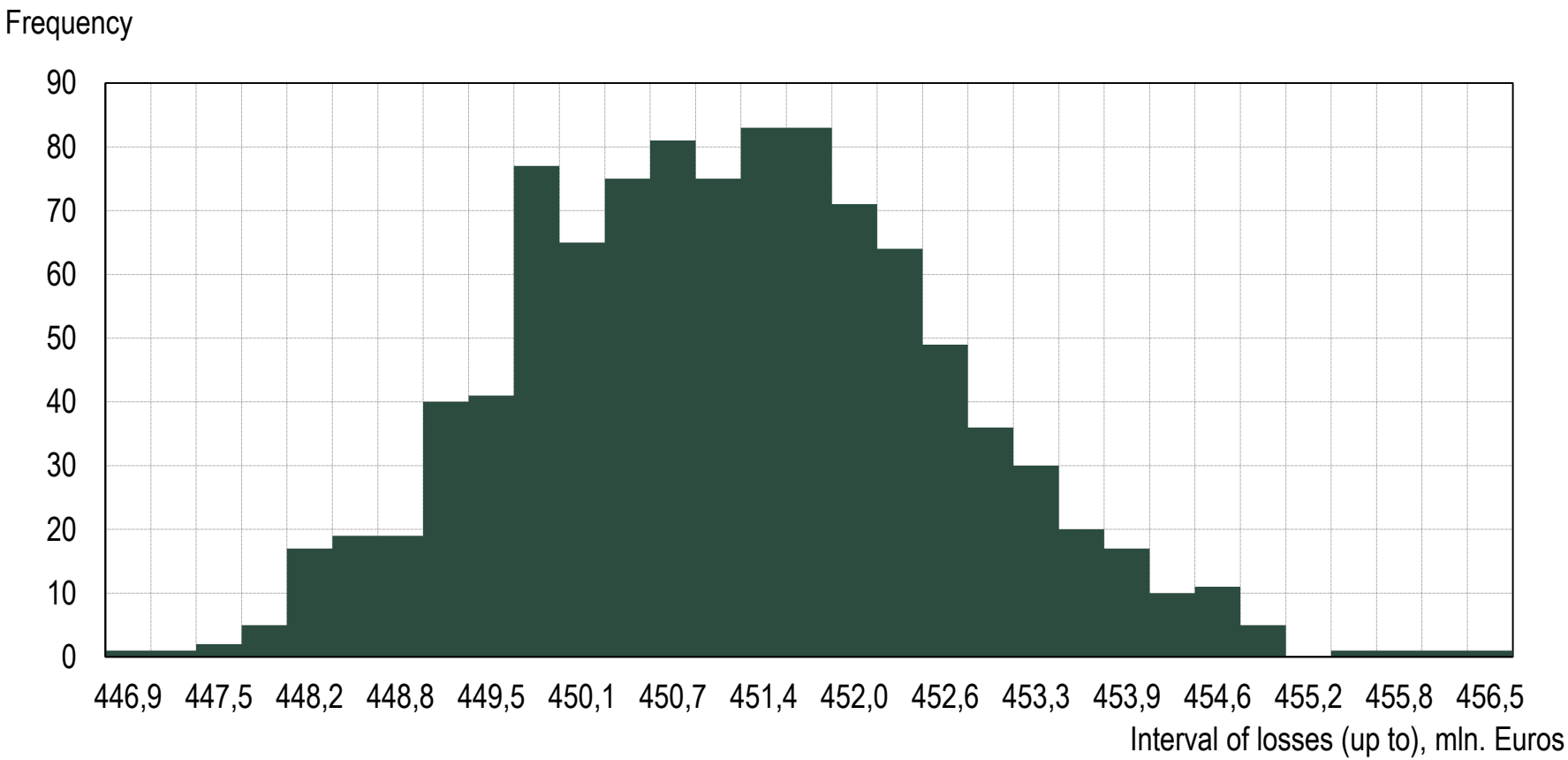
Evaluation of various shocks' impact on households' financial situation and stability (adverse scenarios)



Source: authors' diagram and calculations; results of simulation data.

Findings and conclusions (2)

Evaluation of various shocks‘ impact on households‘ financial situation and stability (adverse scenarios)



Source: authors‘ diagram and calculations; results of Monte Carlo simulation data.

Findings and conclusions (3)

- Financial system is stressed the most when all analyzed shocks materialise at one time
- In the joint adverse shock scenario the expected losses would amount to around 1/6 of banks‘ capital
- Analyzing separate scenarios, Lithuanian credit institutions are the most sensitive to income and unemployment shocks
- Households are relatively resilient to interest rate shocks
- Banks are also more resilient now than before the crisis of 2008

Caveats and suggestions

- Caveats:
  - quality of micro data
  - shocks usually do not materialise all at once
  - assumptions may change from time to time
- Suggestions:
  - to augment calculations with more precise, time varying data (e.g. from the tax authority, land registry)


Thank you