The impact of the credit crunch on the Polish economy

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Question

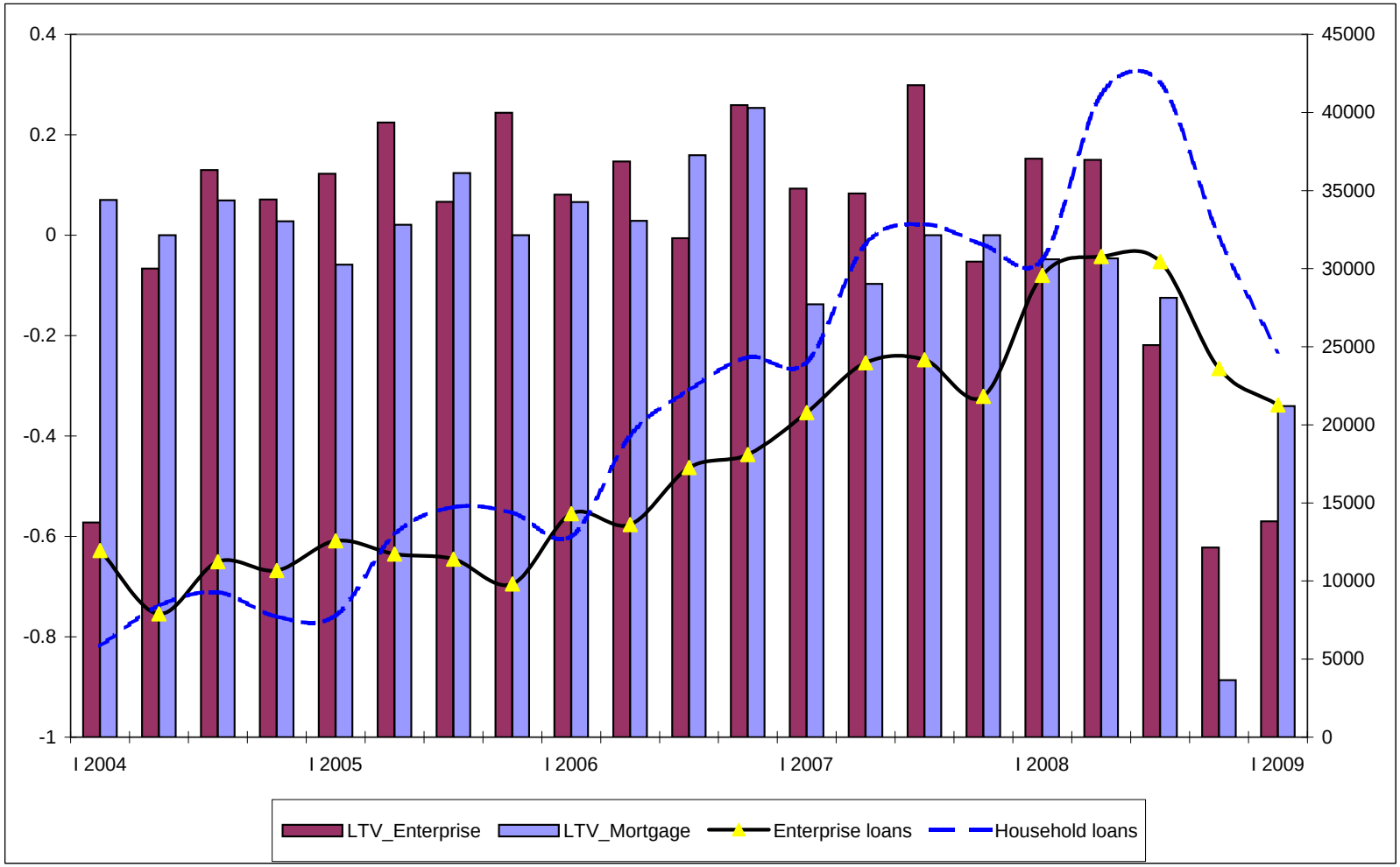
- What was the role of the banking sector in the propagation of the financial crisis?
- How much of GDP decline in Poland was generated by financial frictions?

Short history of the crisis in Poland

- Credit crunch
  - Increase in lending restrictions (and spreads)
  - Decline in loans to households and firms
- Decline in external demand
- Effect: Decrease of exports and lower growth of GDP

Short history of the crisis in Poland

Lending restrictions and credit creation in Poland. (*Source: NBP*)



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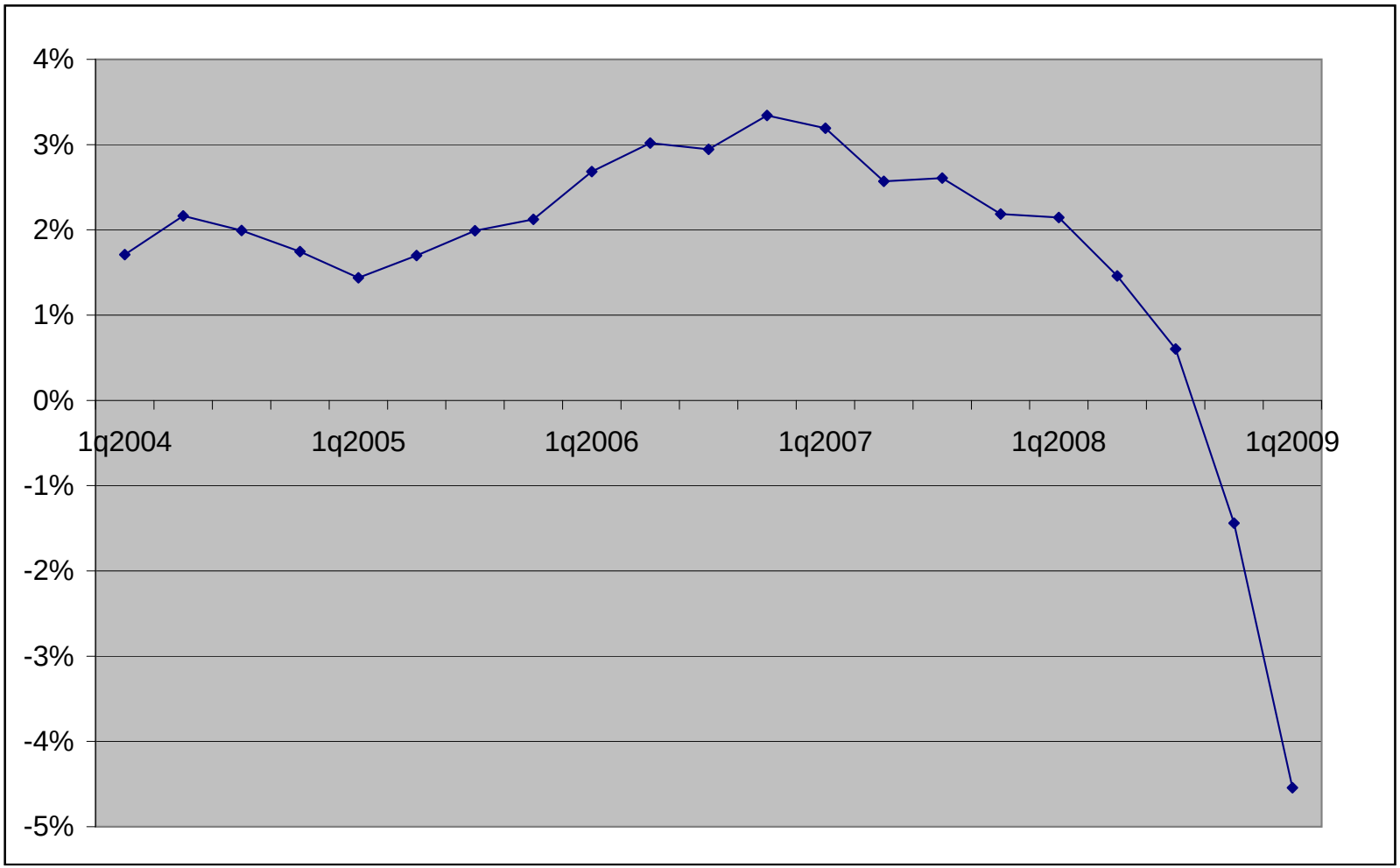
Short history of the crisis in Poland

Decline in external demand: GDP yoy in the EA



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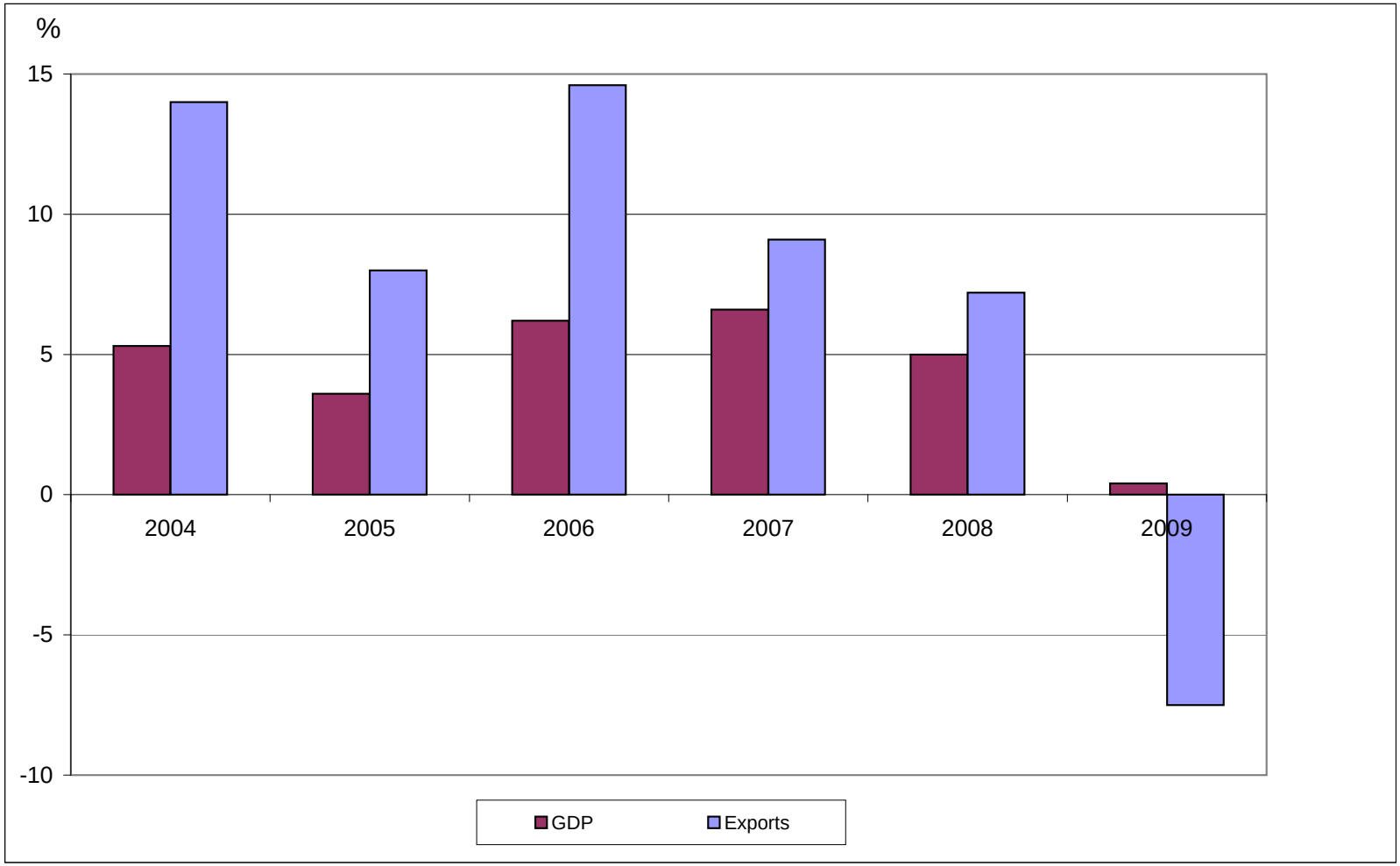
Short history of the crisis in Poland

Export and GDP in Poland



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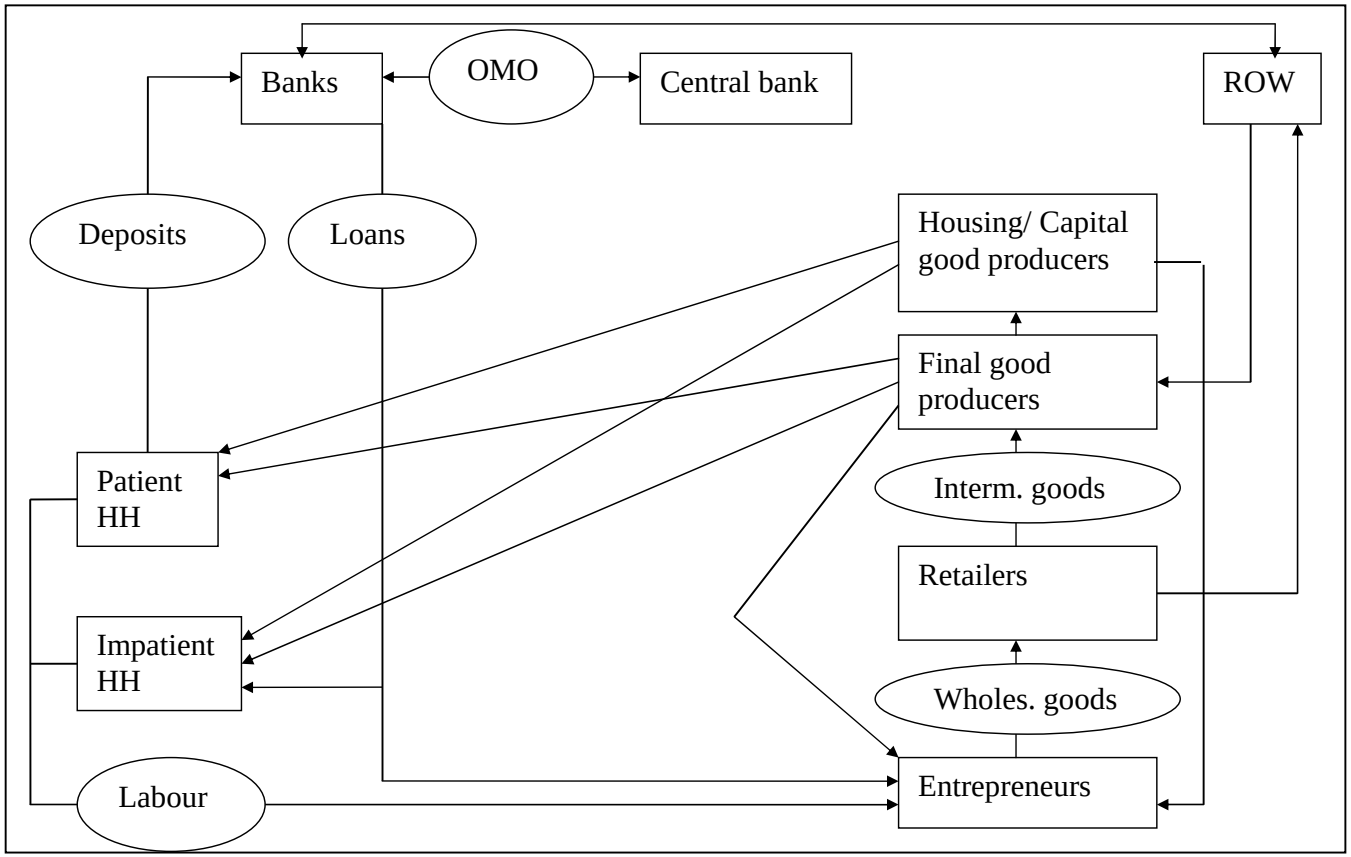
Literature

- The interest in models with financial frictions is growing rapidly.
- Two main strands of literature:
  - Bernanke et al. (1999): financial accelerator through prices (interest rates). The cost of monitoring increases spreads between the lending and the risk free rate.
  - Iacoviello (2005): financial accelerator through quantities. Collateral puts a constraint on the volume of lending.
- Work in progress!!!

Key Features

- Small open economy new Keynesian model of business cycle.
- Non-neutrality of monetary policy due to: - Nominal rigidities - prices and wages are set according to a Calvo scheme (Calvo, 1983)
- Monetary Policy - Taylor rule (Taylor, 1993)
- Financial frictions - following Iacoviello (2005) and Gerali et al. (2008):
  - collateral constraints on HH and enterprises,
  - stochastic shocks to credit constraints and spreads.

Structure


Banks
OMO
Central bank
ROW
Deposits
Loans
Housing/ Capital good producers
Final good producers
Patient HH
Interm. goods
Retailers
Impatient HH
Wholes. goods
Labour
Entrepreneurs

Households

- There are two types of households: patient, P, and impatient, I.
- In equilibrium patient HHs save and impatient HHs borrow.
- Patient HHs maximise utility
  $$E_0 \sum_t (\beta_P)^t u(c_t^P, \chi_t^P, n_t^P, \varepsilon_t),$$
  subject to the budget constraint.
- Impatient households maximise utility
  $$E_0 \sum_t (\beta_I)^t u(c_t^I, \chi_t^I, n_t^I, \varepsilon_t),$$
  subject to the budget constraint and the credit constraint
  $$R_{L,t}^H L_t^H \leq m_t^H E_t \left[P_{\chi,t+1} \left(1 - \delta_\chi\right) \chi_t^I \right]$$
  where $m_t^H \sim AR(1)$ denotes LTV ratio. Thus to get a loan they need collateral (housing).

Entrepreneurs (wholesale good producers)

- Do not work, run firms. Sell their product in a competitive market.
- Are impatient ($\beta_E = \beta_I$).
- Own capital and use it as collateral for loans.
- Maximise utility
  $$E_0 \sum_t (\beta_E)^t u(c_t^E, \varepsilon_t),$$
  subject to the flow of funds and the credit constraint
  $$R_{L,t}^F L_t^F \leq m_t^F E_t \left[P_{k,t+1} \left(1 - \delta_k\right) k_t\right]$$
  where $m_t^F \sim AR(1)$ denotes LTV ratio.
- Other (intermediate and final good) producers are standard.

Banking

- Monopolistically competitive markets - nominal rigidities (Calvo) slow down the adjustment of the interest rates.
- Banks have access to the domestic and international interbank market.
- Deposit banks
  - Collect deposits from patient households and deposit them in the interbank market. $z_{D,t} \sim AR(1)$ affects the spread between the interbank rate R_t and the HHs deposit rate $R^H_{D,t}$.
- Lending banks
  - Take loans in the interbank market and grant loans to impatient HHs and firms. $z_{L,t} \sim AR(1)$ affects the spread between the interbank rate R_t and the lending rate $R_{L,t}$.
  - Borrowing constraints tied to housing (HHs) and capital (firms)

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Calibration/estimation

- Parameters that are widely discussed in the literature and steady state parameters were calibrated.
- Remaining parameters Bayesian Estimation,
- Quarterly data 1q1997 - 1q2009,
- 14 time series:
  - PL: GDP, C, I, G, Inf, WIBOR3M, HH loans, Enterprise loans, Spread on HH loans, Spread on enterprise loans, Spread on HH deposits.
  - EUR: GDP, Inf, EURIBOR3M.

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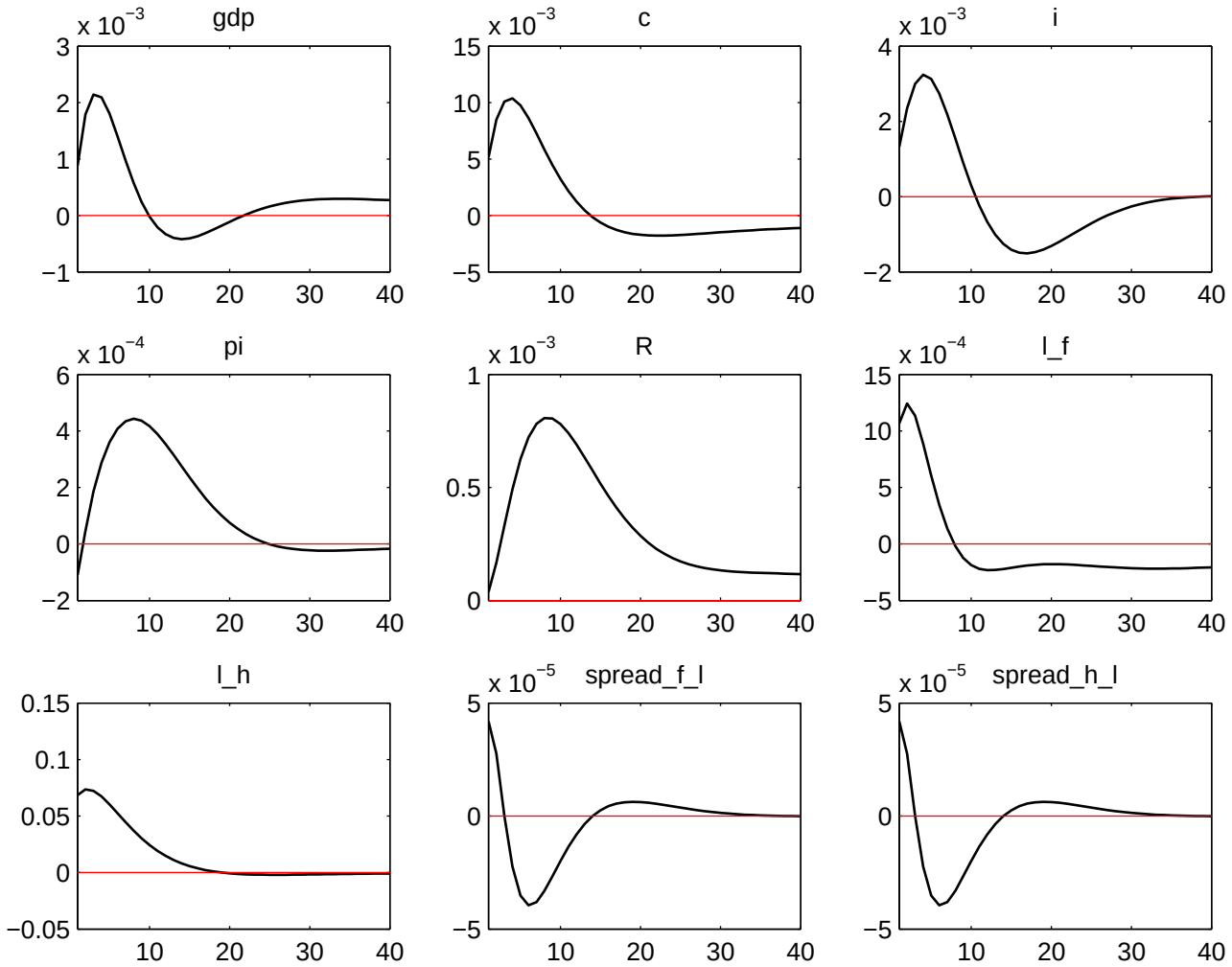
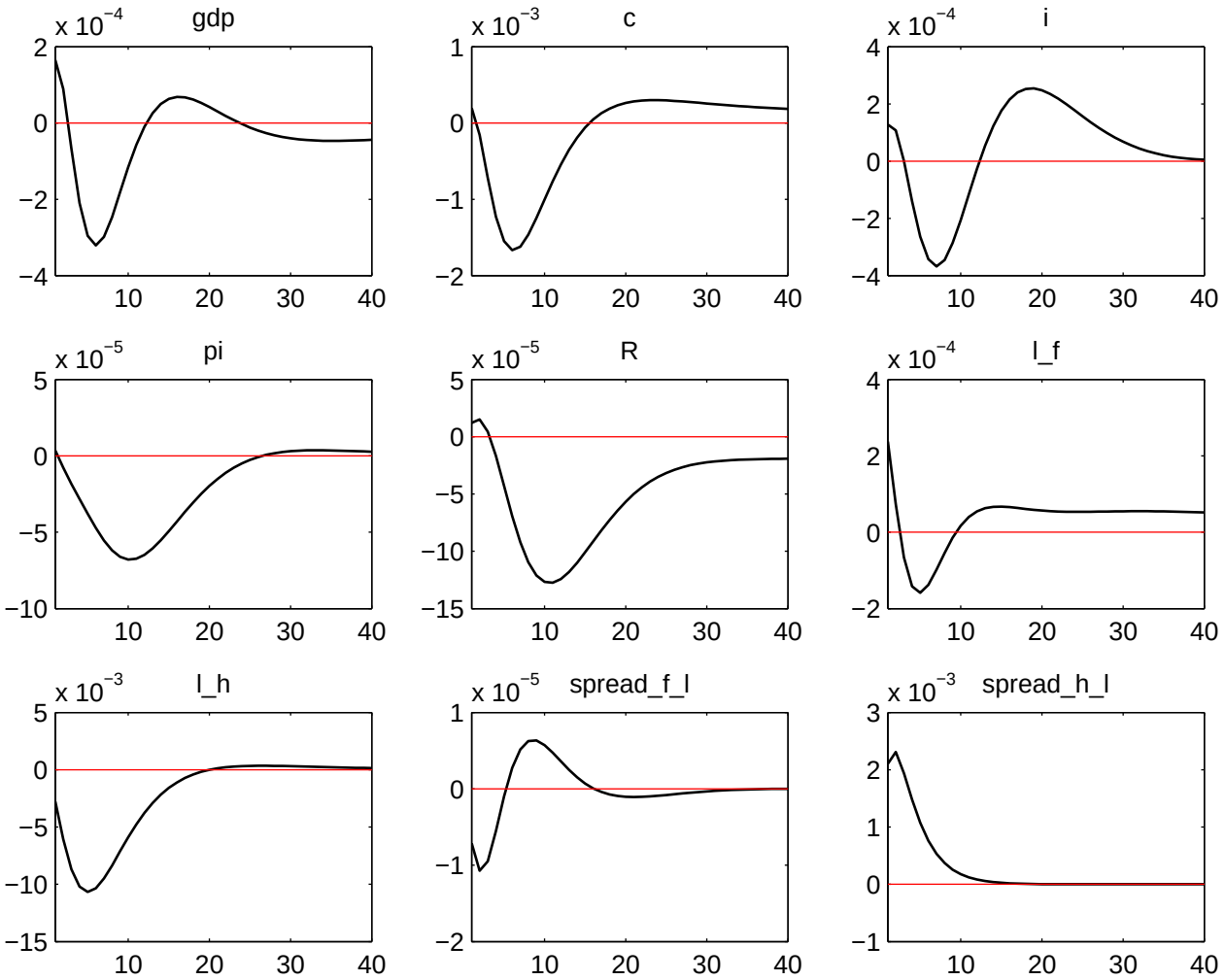
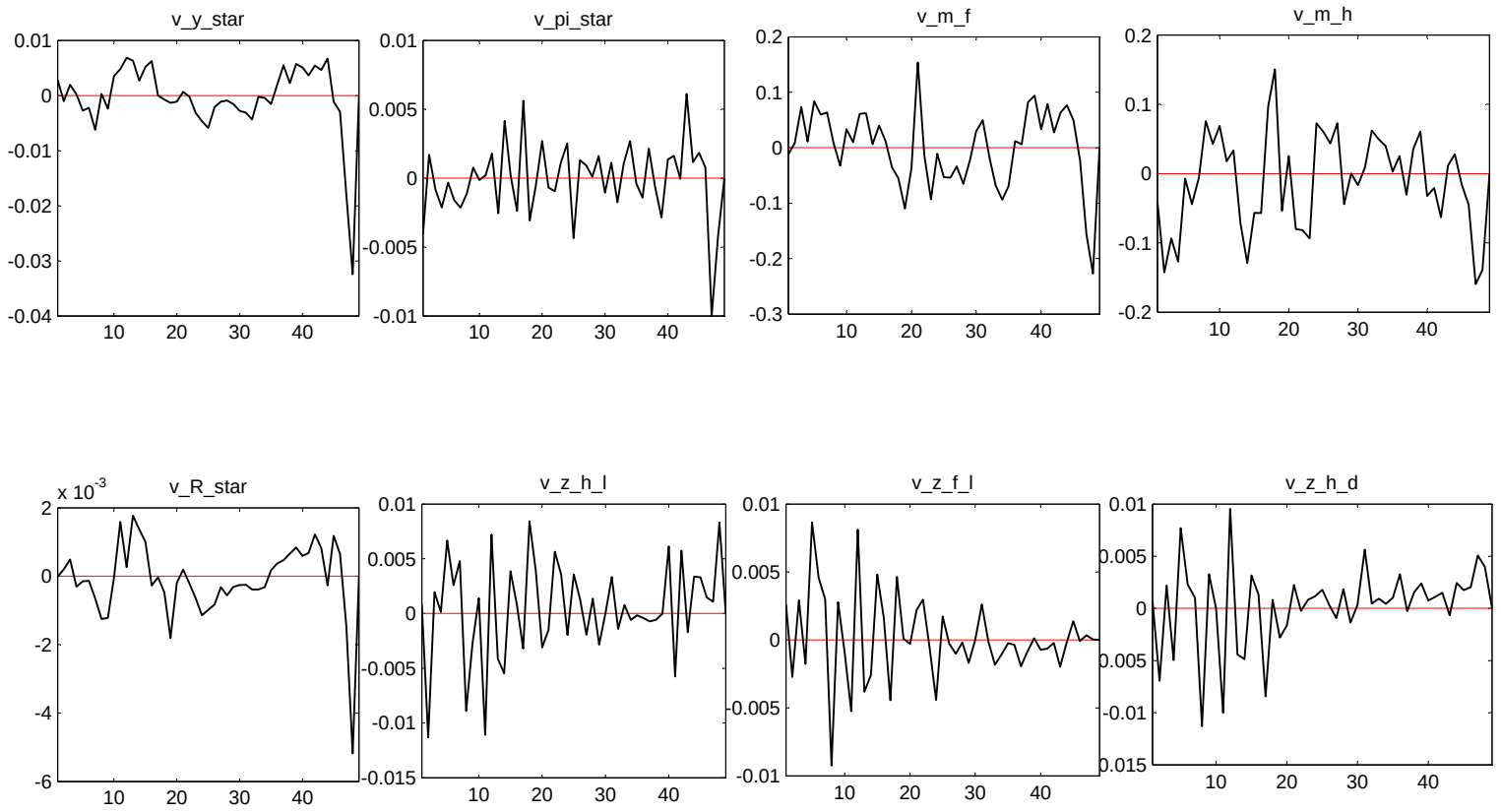
HHs loans LTV shock



HHs loans spread shock



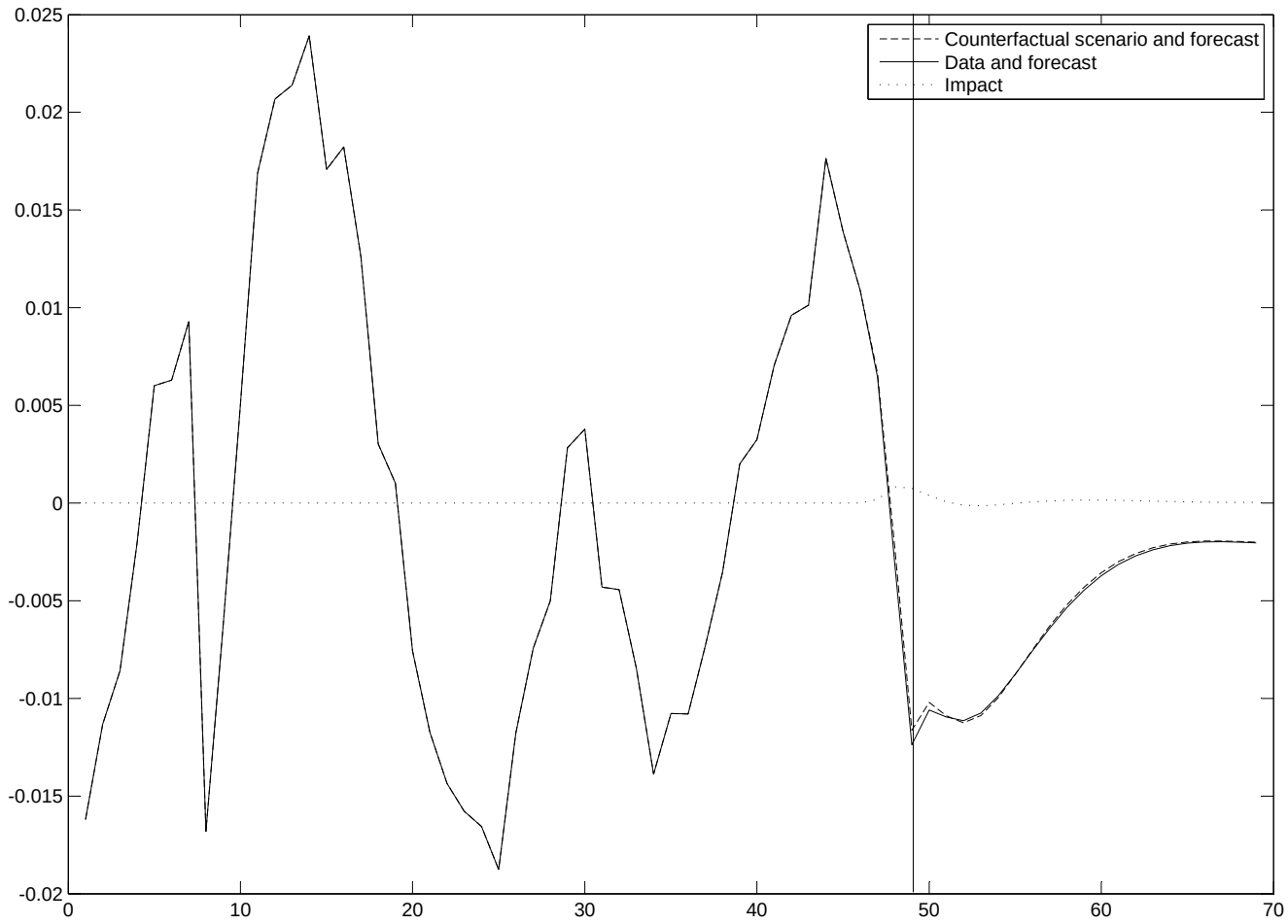
Historical realisations of selected shocks



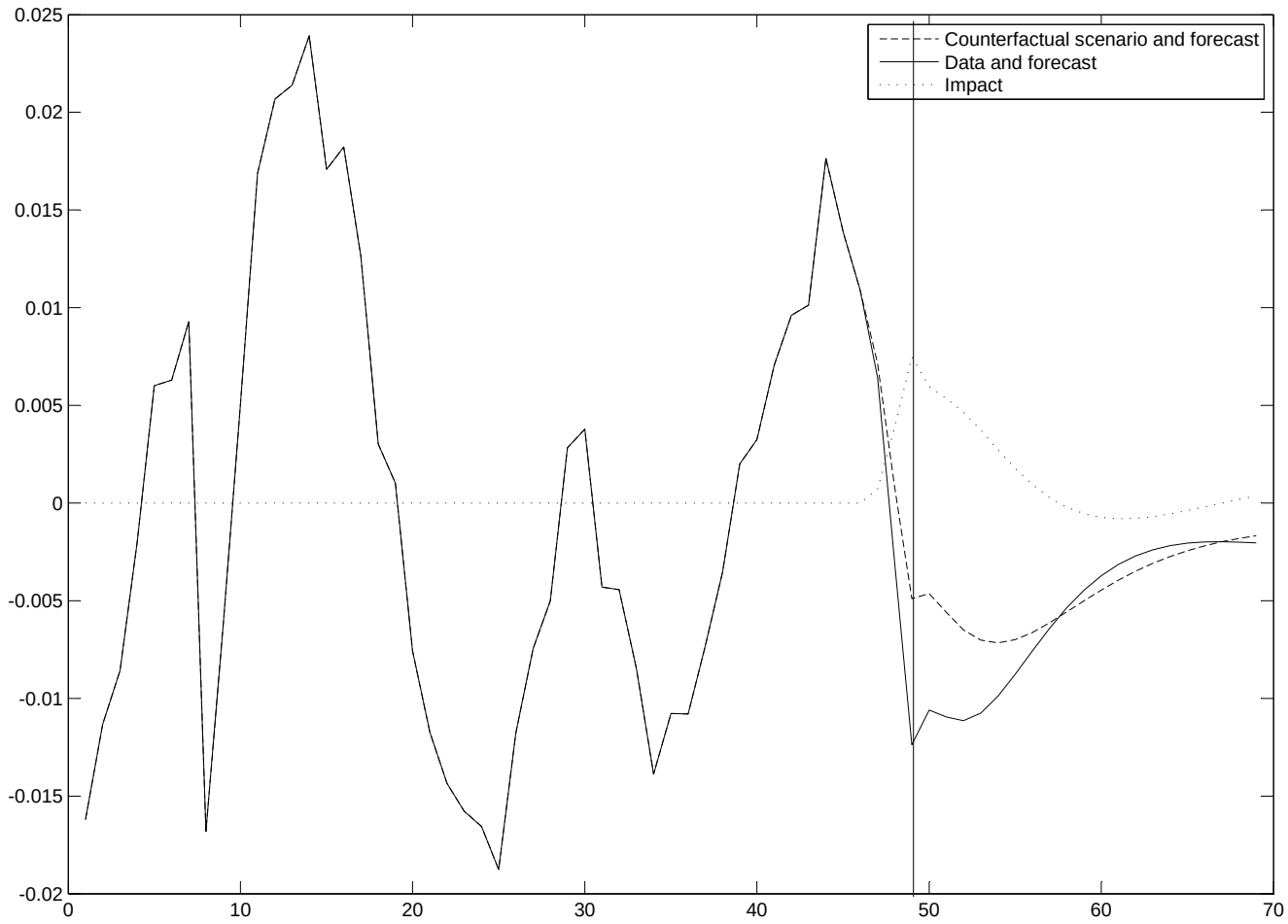
Simulation

- The goal of the simulation is to separate out the impact of the credit crunch on GDP,
- We run counterfactual simulation: hypothetical GDP without financial shocks,
- Selected shocks are set to zero in the period 3q2008-1q2009,
- We group shocks - shocks to spreads and to LTVs,
- To obtain a better visualisation of the impact of the credit crunch we make an unconditional forecast for 20 quarters (it should be treated as a visualisation of the strength of the impact rather than a real forecast),
- Comparison with the impact of external shocks.

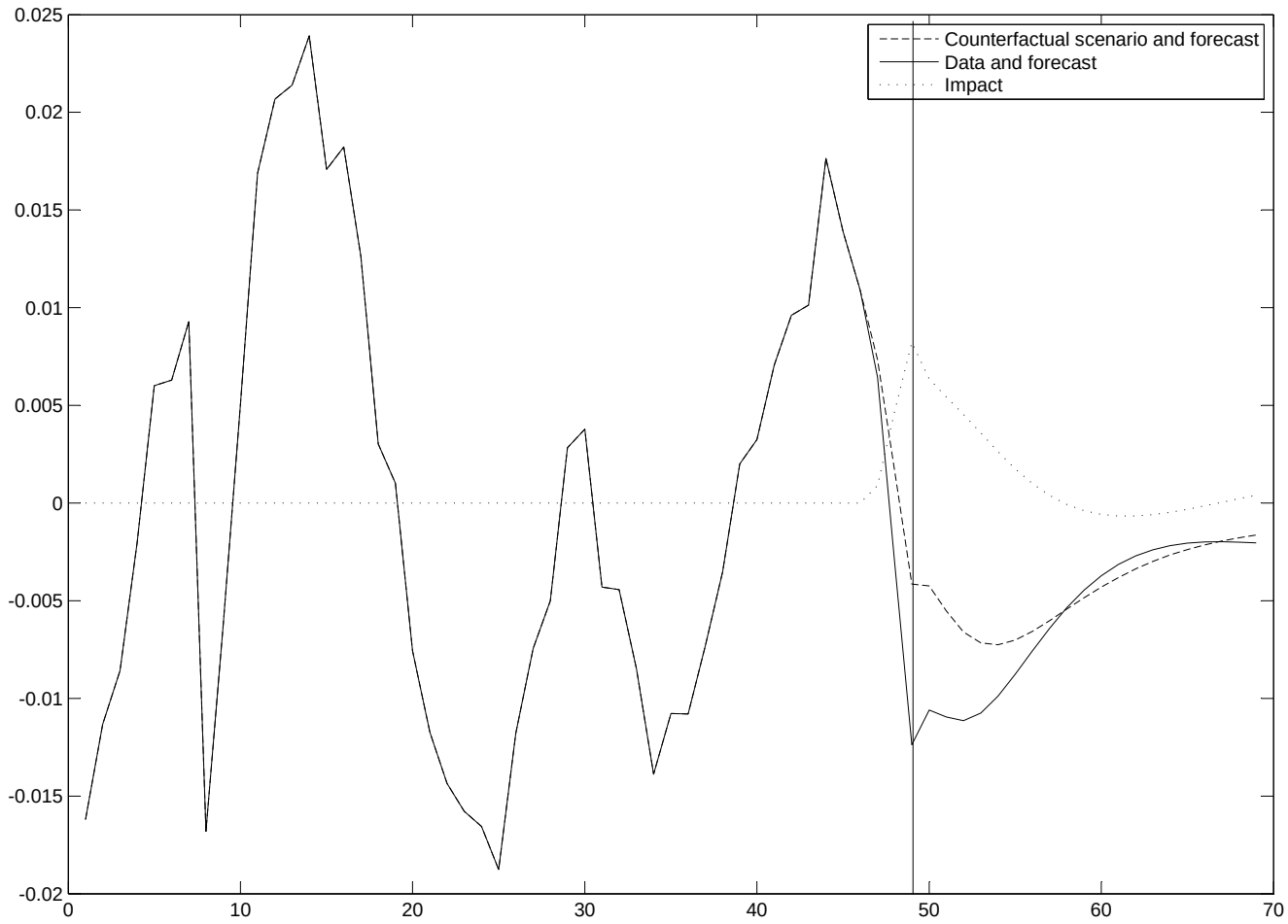
Scenario 1: No spread shocks



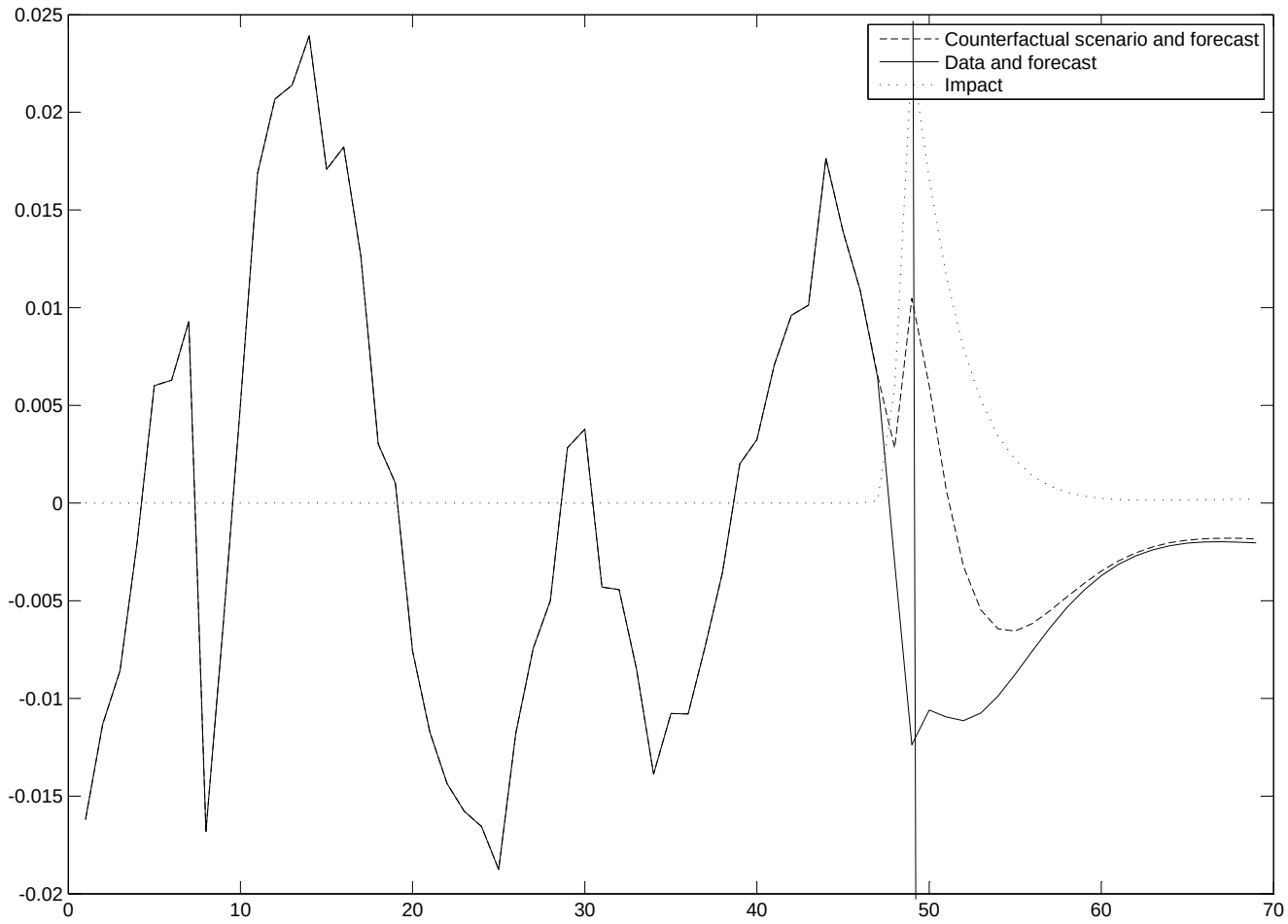
Scenario 2: No LTV shocks



Scenario 3: No financial shocks



Scenario 4: No external shocks



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Conclusions

- Model allows to identify the impact of the financial turmoil on the Polish economy,
- The role of direct credit restrictions is greater than the role of the price of credit (spreads),
- Financial shocks have a quantitatively important effect, nevertheless their impact is smaller than the impact of external shocks,
- Still work in progress: moment conditions, endogeneity of the banking sector, entry-exit of firms etc.

Thank you.