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Price dynamics and transmission of shocks along the food processing chains

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Outline of the presentation

- Short presentation of two research projects conducted at FELU:
  1. Transmission of shocks along the food processing chains
  2. Development of the food price and cost monitoring tool

- Main team:
  - Aleš Kuhar
  - Aljoša Feldin
  - Sašo Polanec
  - Igor Masten

- Financial support:
  - Ministry of aggriculture, forestry and food
  - Slovenian research agency

Transmission of shocks along the food processing chain

Issues

- Analysis of price dynamics

- Data:
  - Need to obtain methodologically consistent time series for representative products
  - Coverage of all major chain links:
    - Production (primary)
    - Processing (secondary)
    - Retail – distribution (tertiary)
  - Monthly frequency

Transmission of shocks along the food processing chains

Price chains

- Chains:
  1. Milk1: Purchase price dairies – UHT milk dairies – UHT milk retail price MPC
  2. Milk 2: Purchase price dairies – Full-fat milk dairies – Full-fat milk retail price MPC
  3. Cheese: Purchase price dairies – hard cheese dairies – hard cheese retail
  4. Butter: Purchase price dairies – butter dairy – butter retail
  5. Beef: cattle farmers – cattle butcher – beef retail

Transmission of shocks along the food processing chains

Price chains

7. Chicken: chain analogous to beef
8. Pork: chain analogous to beef
9. Eggs: fresh eggs farmers – eggs distributions – eggs retail MPC
10. Bread: wheat – flour – bread (white) retail
11. Potatoes: potato farmers – potato retail
12. Apples: apples farmes – apples retail

Transmission of shocks along the food processing chains

Analysis of shock transmission

- Econometric analysis of transmission of food-price shocks along the chains

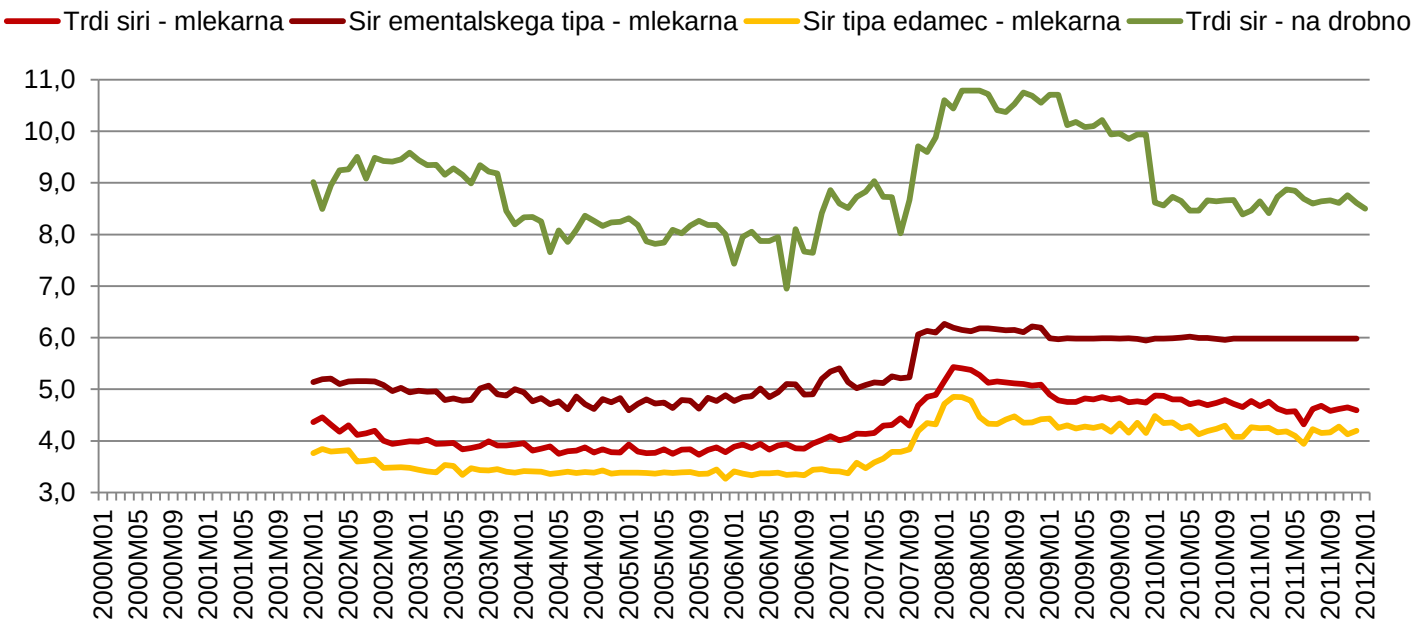
- Experiment:
  - Exogenous price shocks at the beginning of the chains (shocks to input prices in meat production or exogenous increases in primary food products)
  - Evaluate (1) the extent and (2) dynamics of transmission into
    - Processing prices
    - Retail prices

Transmission of shocks along the food processing chains

Methodology

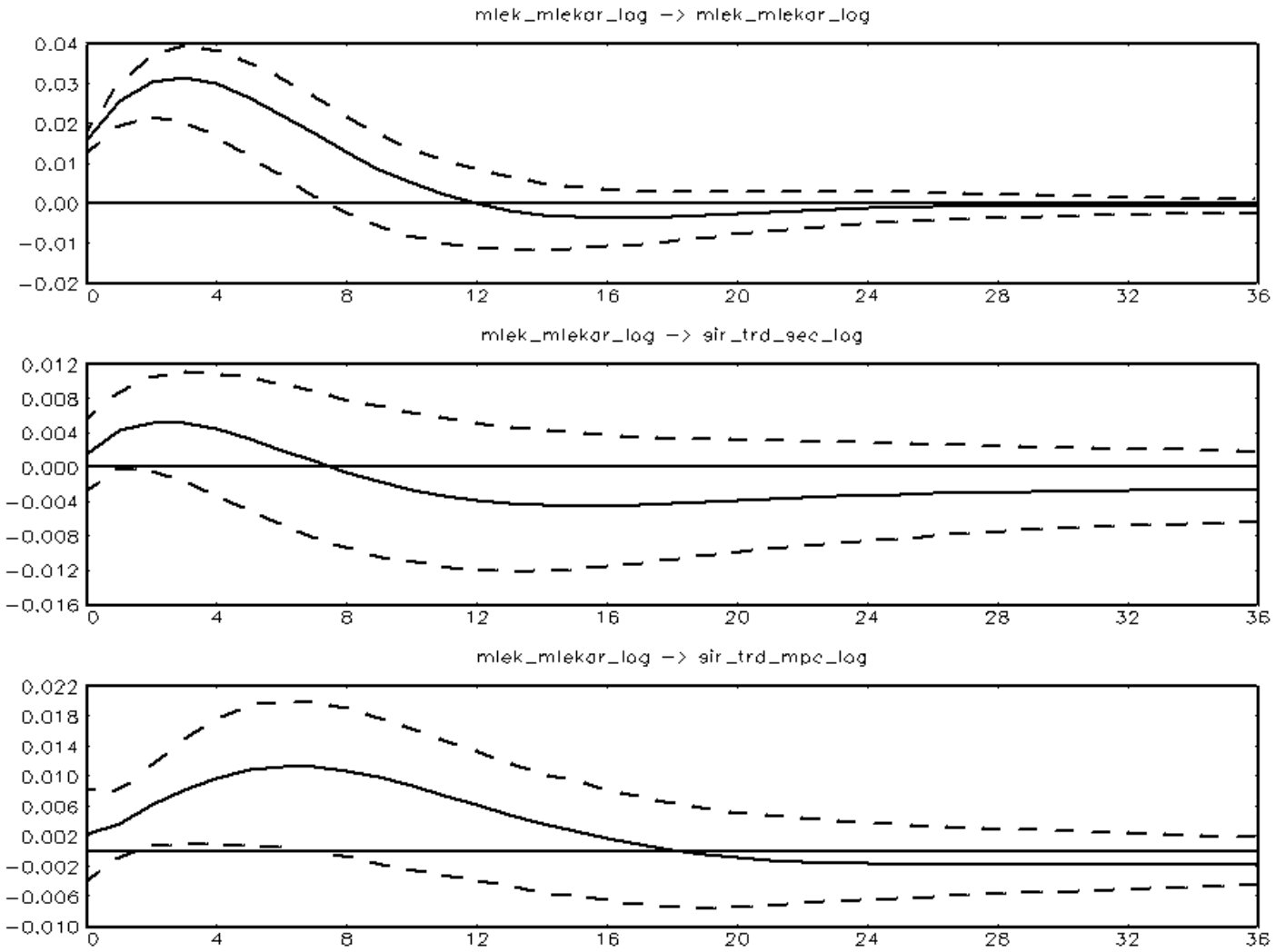
- Price chains modelled as systems of dynamic stochastic linear equations
- VAR – vector autoregressions
- Procedure:
  1. Estimate a well-specified VAR
  2. Check for stable equilibrium relations among prices (cointegration analysis) – Q: Are there stablče margins in the long run
  3. Estimate shocks for each chain link
  4. Orthogonalize shocks - Assumption: prices at beginnings of chains adjust less to other prices
  5. Estimate impulse response functions
  6. Estimate the error-variance decomposition

Example of weak transmission: Cheese

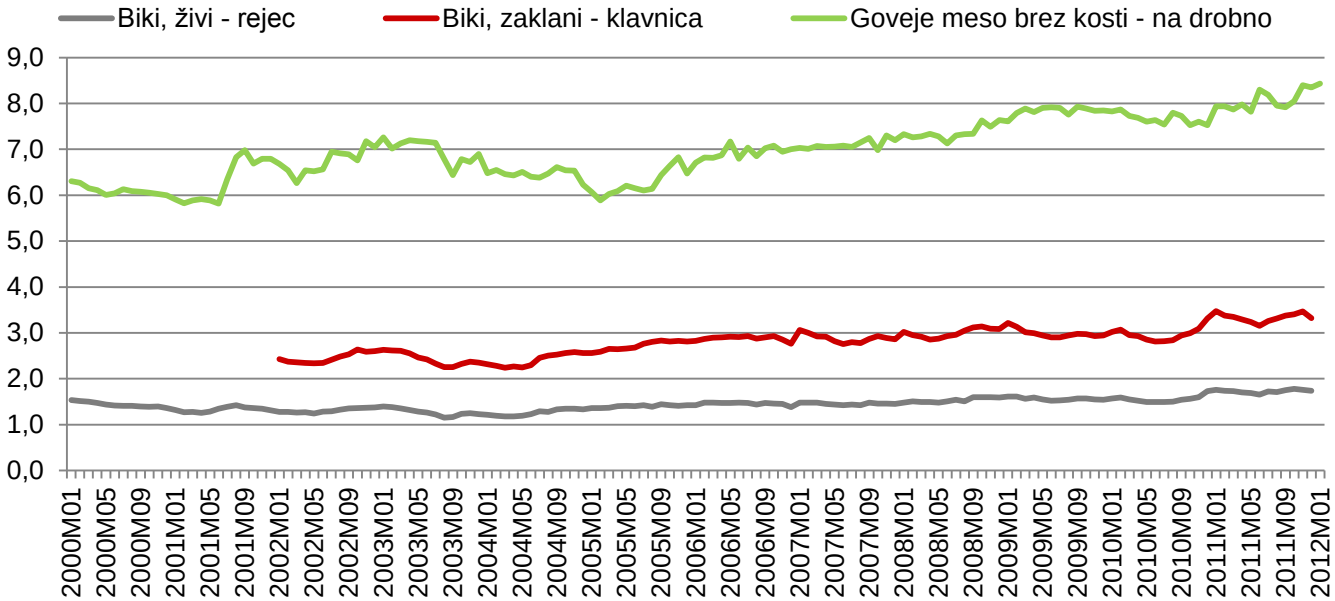


- Margins unstable in time
- Exogenous changes in the prices of milk explain only 5% of the exogenous variance of the prices of cheese in dairies, and up to 18 % of retail prices at 3-year horizon

Example of weak transmission: Cheese
Impulse responses

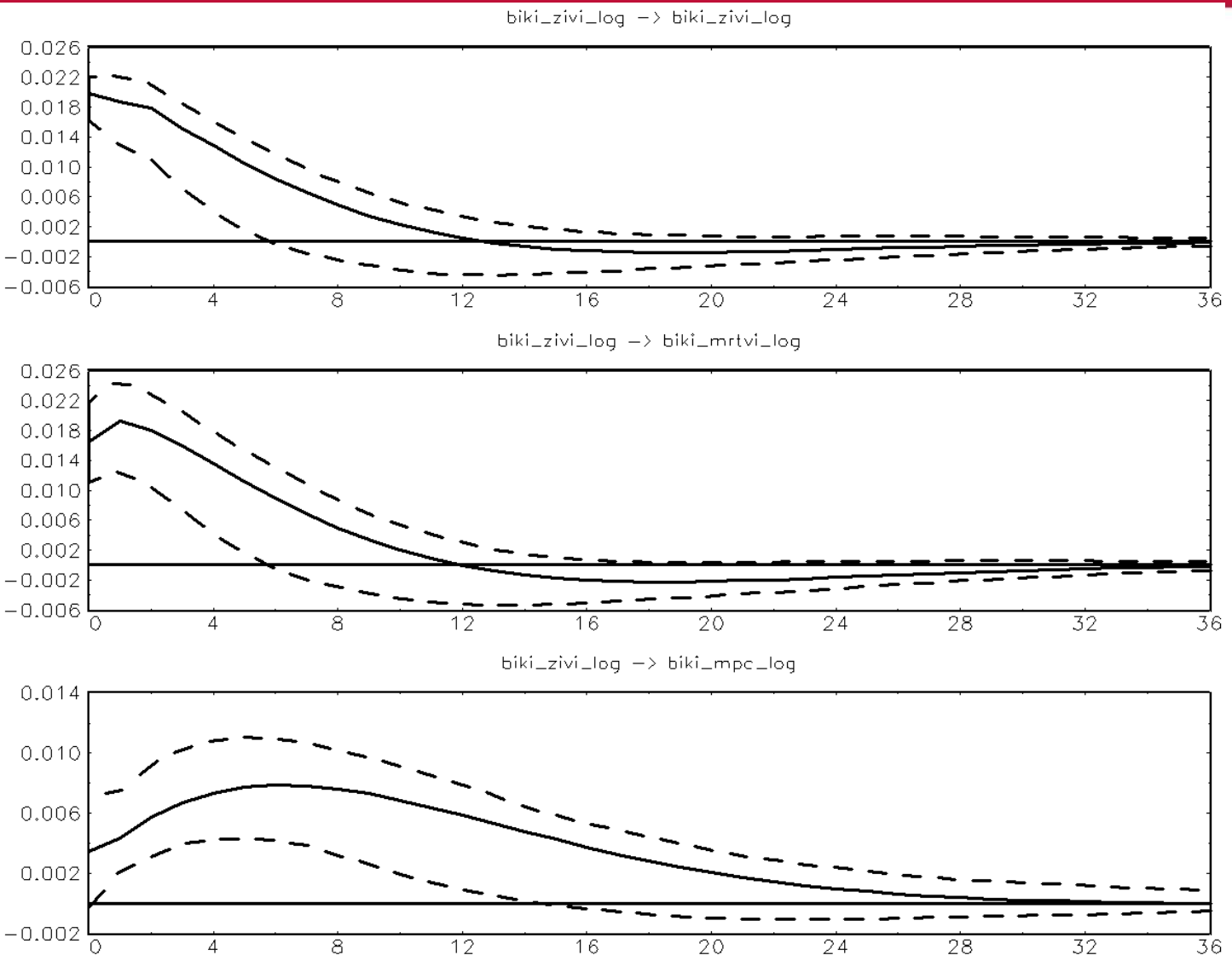


Example of strong transsmission: Beef



- Margins unstable in time
- Exogenous changes in the price of meat explain up to 69% of the exogenous variance of the prices of meat at processing stage, and up to 34 % of retail prices at 3-year horizon

Example of strong transsmission: Beef Impulse responses



Value for policymakers

- Identify product groups with strong or weak exogeous component in price dynamics
- Monitor price changes
- Identify potential ant-competitive market practices

Weakness

- Measures of costs of intermediate products only
- Other costs (and their dynamics) not accounted for
- Potentially misleading conclusions about changes in profit margins
- Abuse of market power only one potential cource of changes in margins
- For this reason …

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Food price and cost monitoring methodology

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Food price and cost monitoring methodology

Overview

- Several food price montoring tools out there
- To evaluate changes in margins need to measure costs
- Our tool can measure both prices and costs
- Unique at international level

Food price and cost monitoring methodology

Data heavy-lifting

- Data sources: SISTAT most useful for secondary and tertiary, Agriculture institute for primary

- Product level (NIP, EAN) price data – over 10 years at monthly frequency
  - Construction of price indexes
  - Weights from firm-level data

Food price and cost monitoring methodology

Data heavy-lifting

- Cost indexes:
  - Labor cost
  - Intermediate inputs
  - Weights from firm-level input-output tables
- Issue of multi-product firms
- Issue of cost allocation at tertiary (distribution, retail) level
- Still not complete account of costs

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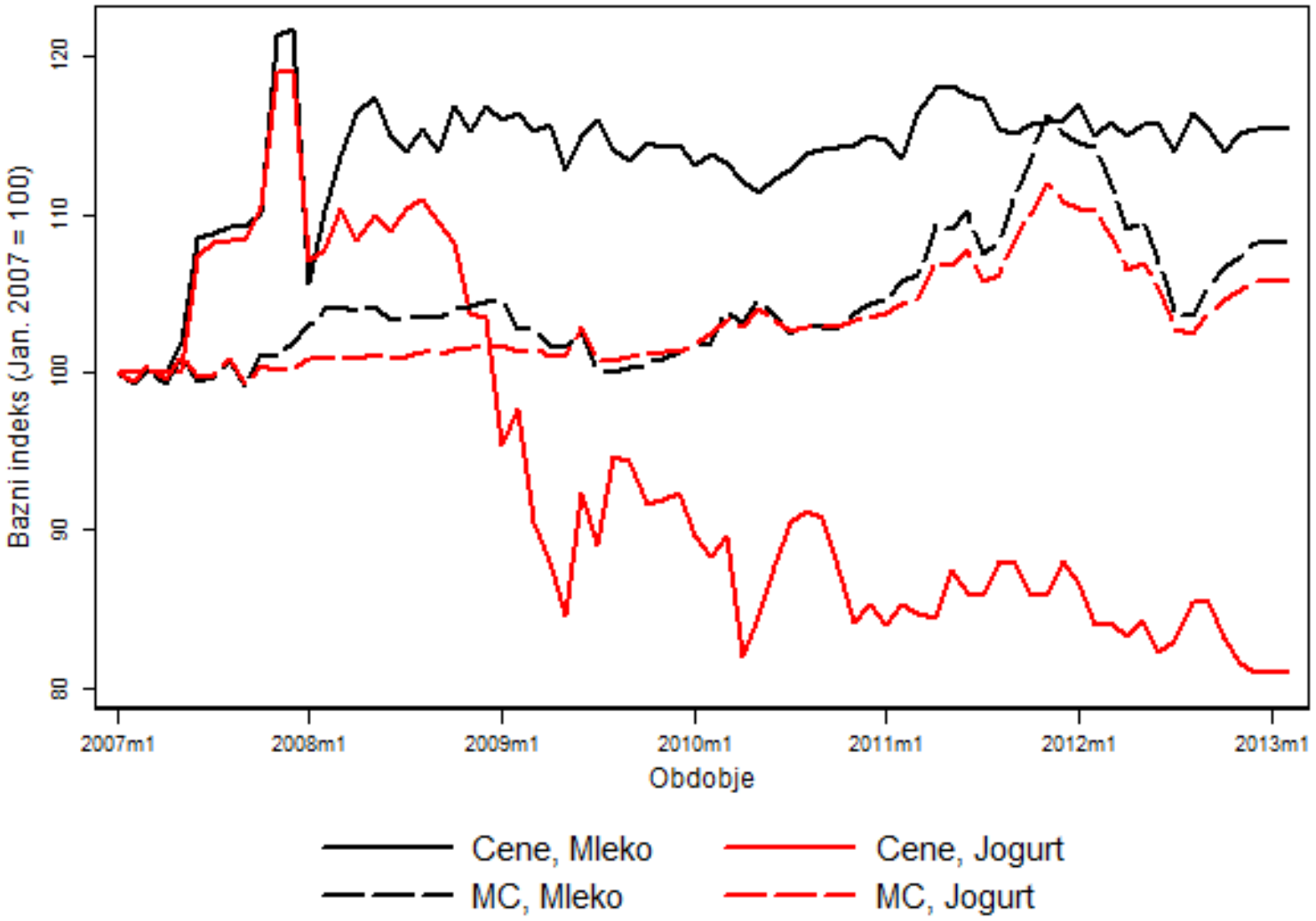
Example: Prices and marginal cost of milk and yoghurt at processing level



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Thank you for your attention!