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Price transmission along the CIS wheat-to-bread supply chains

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Leibniz Institute of Agricultural Development in Transition Economies
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AGRICIS TRADE
SEVENTH FRAMEWORK PROGRAMME

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Research background

Research conducted under the AGRICISTRADE project:

"Exploring the potential for agricultural and biomass trade in the Commonwealth of Independent States (CIS)" (www.agricistrade.eu)

Countries included in the study:

Armenia, Azerbaijan, Belarus, Russia, Kazakhstan, Moldova, Ukraine and Georgia } CIS

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Research background

Trade relations between the EU and selected CIS
(e.g., negotiations about free trade agreements – Armenia, Georgia, Moldova, and Ukraine);

Regional integration becomes political priority for CIS
(e.g., Eurasian Economic Union);

Extreme agricultural price fluctuations
(e.g., 2007/08, 2010/11, 2012);

Recent geo-political developments
(e.g. Russian agricultural import ban in 2014).

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Research aim

1. To identify how fast and to which extent are price changes transmitted along the CIS wheat-to-bread supply chains.
2. To investigate if some of the supply chain members exercise market power.
3. To identify factors affecting price transmission along the supply chain.

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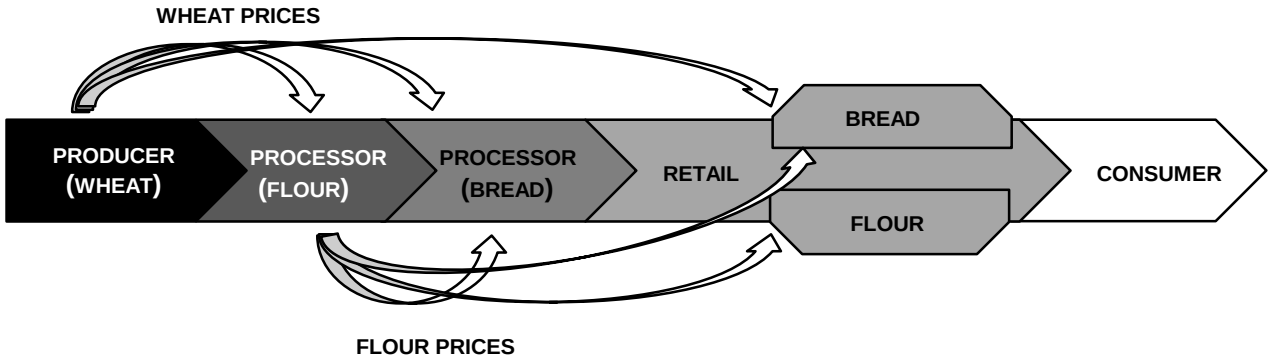
Price transmission approach

VERTICAL



Vertical price transmission	
Long run (pass-through of price changes from one stage of the supply chain to another)	
No	Indicator of market power or governmental interventions
Complete	Indicator of perfect competition
Short run (speed of adjustment)	
Low value	Long period of adjustment (inefficient markets)
High value	Short period of adjustments (efficient markets)

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Price transmission models

Vector error-correction model:

$$\Delta p_t = \alpha\beta' p_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta p_{t-i} + \varepsilon_t$$

Autoregressive distributed lag model:

$$\gamma_t = \beta_0 + \beta_1\gamma_{t-1} + \cdots + \beta_k\gamma_{t-p} + \alpha_0 x_t + \alpha_1 x_{t-1} + \cdots + \alpha_q x_{t-q} + \varepsilon_t$$

Threshold autoregressive model :

$$\Delta\varepsilon_t = I_t\gamma_1\varepsilon_{t-1} + (1 - I_t)\gamma_2\varepsilon_{t-1} + \varphi_t \qquad I_t = \begin{cases} 1 \; if \; \varepsilon_{t-1} \geq \tau \\ 0 \; if \; \varepsilon_{t-1} \leq \tau \end{cases}$$

Non-linear regime-dependent model:

$$\gamma_t = \alpha + \gamma_\alpha D_t + \beta x_t + \gamma_\beta D_t x_t + u_t \qquad D_t = \begin{cases} 1 \; if \; there \; is \; a \; policy \; intervention \\ 0 \; if \; there \; is \; no \; policy \; intervention \end{cases}$$

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Data

Data sources:

- Statistical offices (CIS);
- State and consulting agencies (EU and international markets);
- AGRICISTRADE country reports (CIS: www.agricistrade.eu);
- Scientific papers and country reports (e.g. FAO, WB, OECD, etc.);
- Expert interviews (CIS).

No.	Products	Data description	No. obs.
1	Wheat	Producer prices	77-140
2	Flour	Wholesale/retail prices	74-140
3	Bread	Retail prices	74-140

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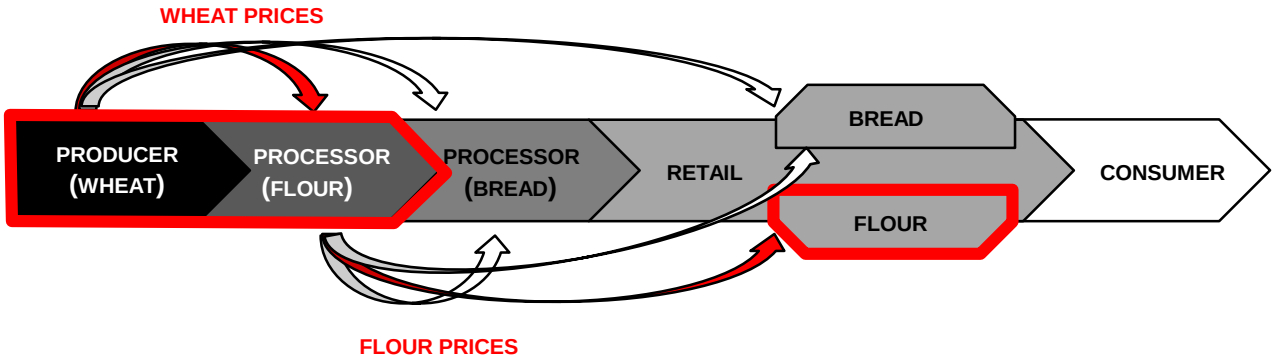
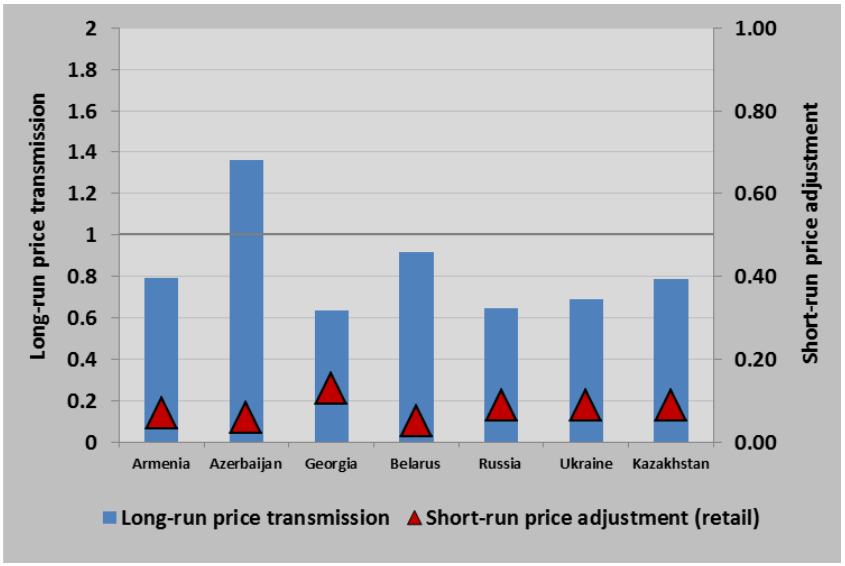
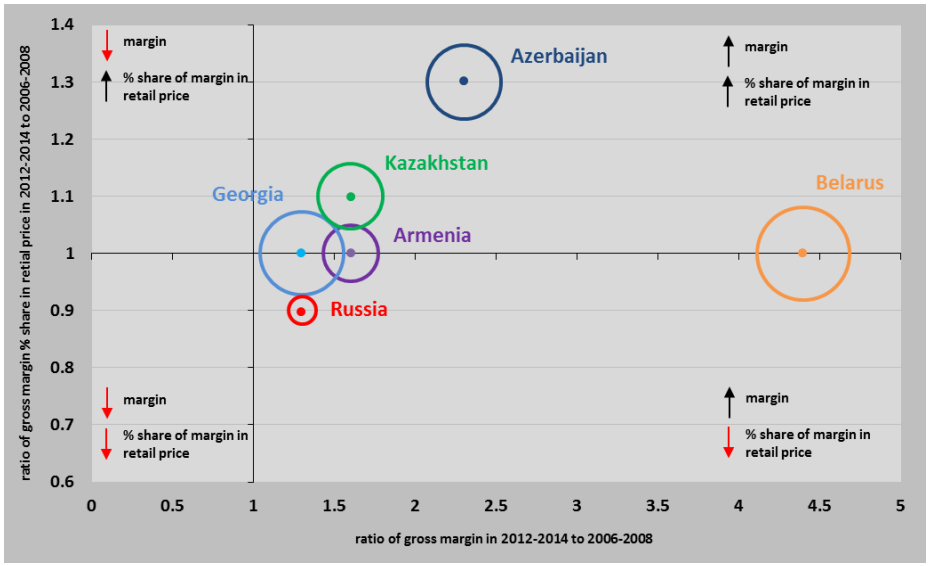
Wheat-to-bread supply chain







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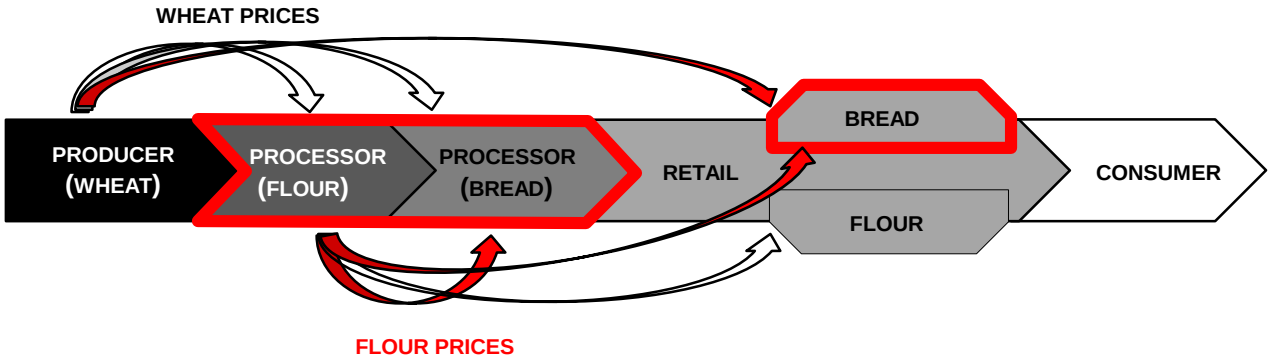
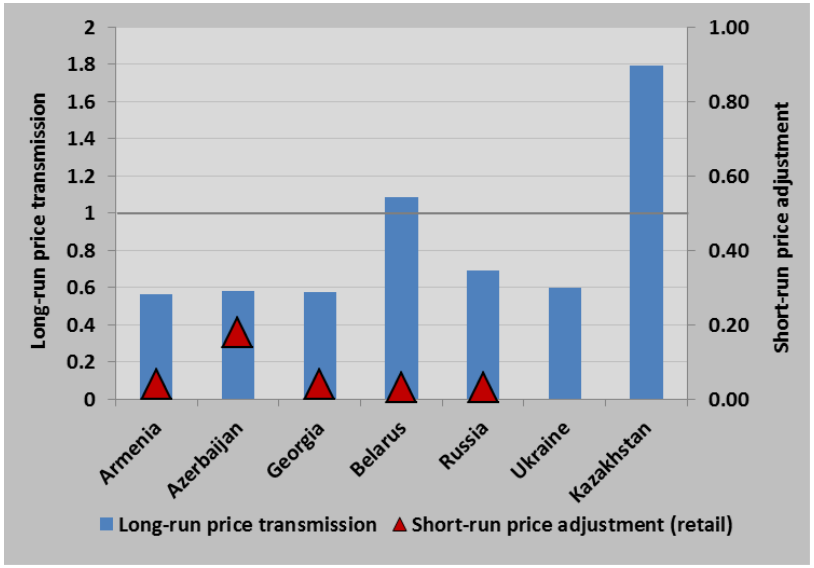
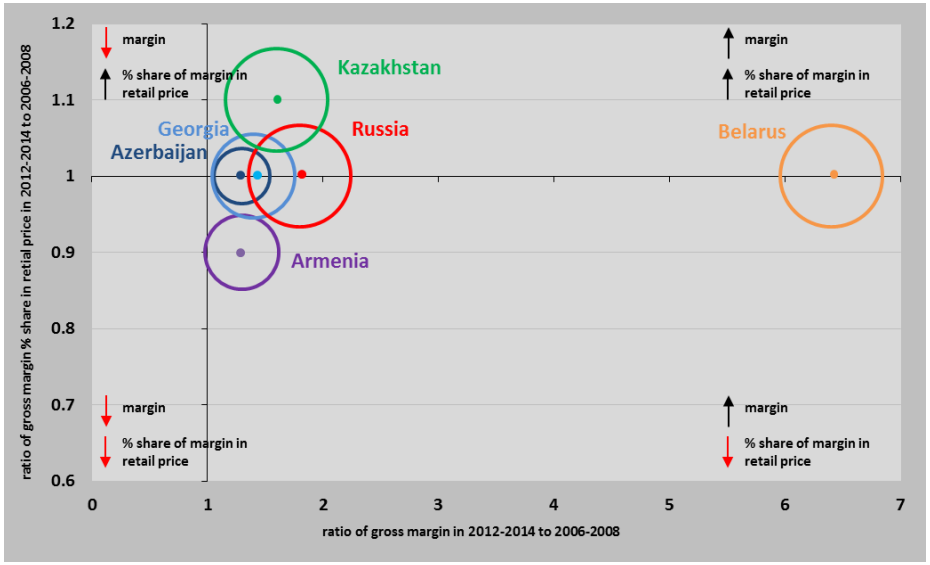
Wheat-to-bread supply chain







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Cross-product comparison

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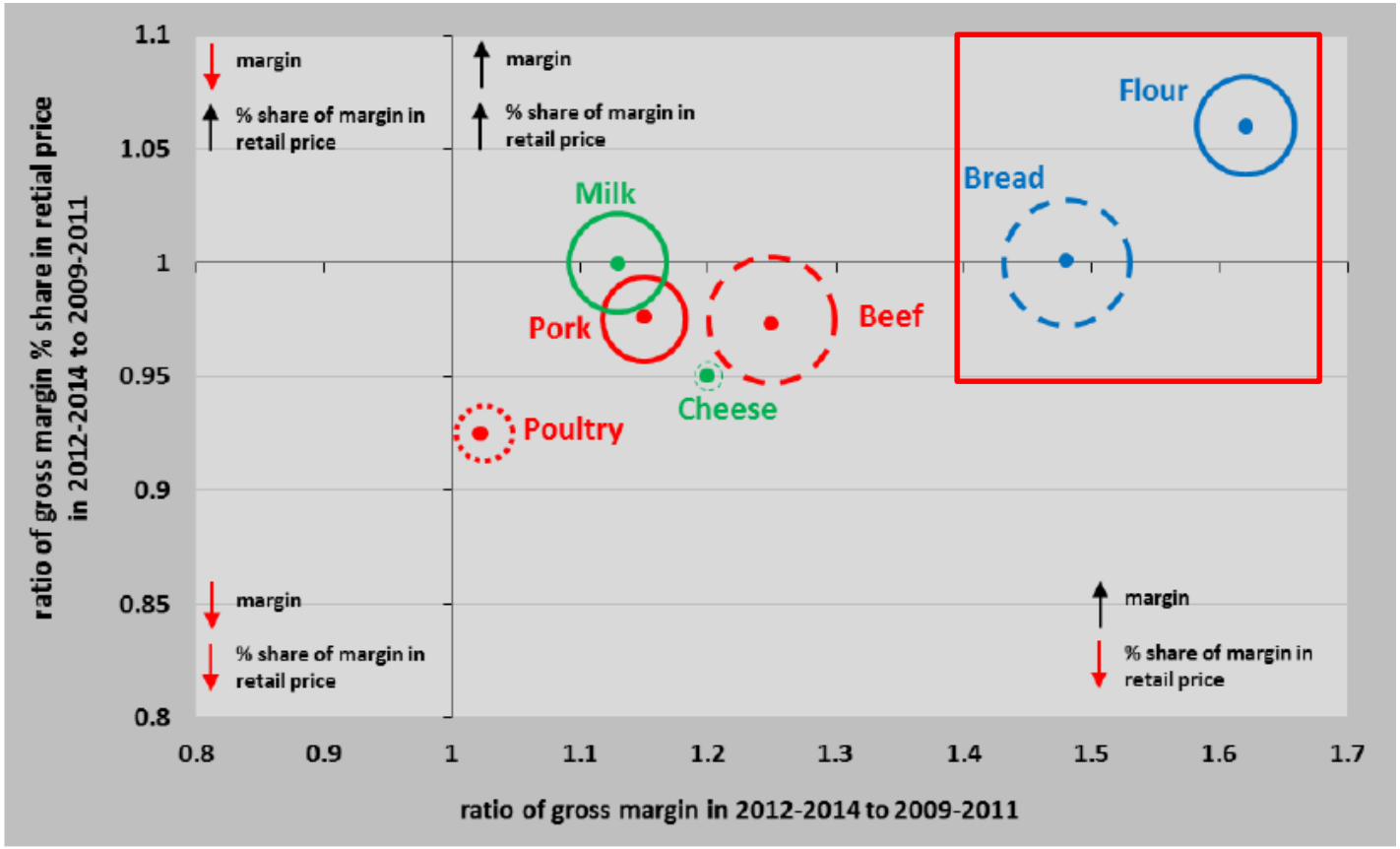
Gross margin developments



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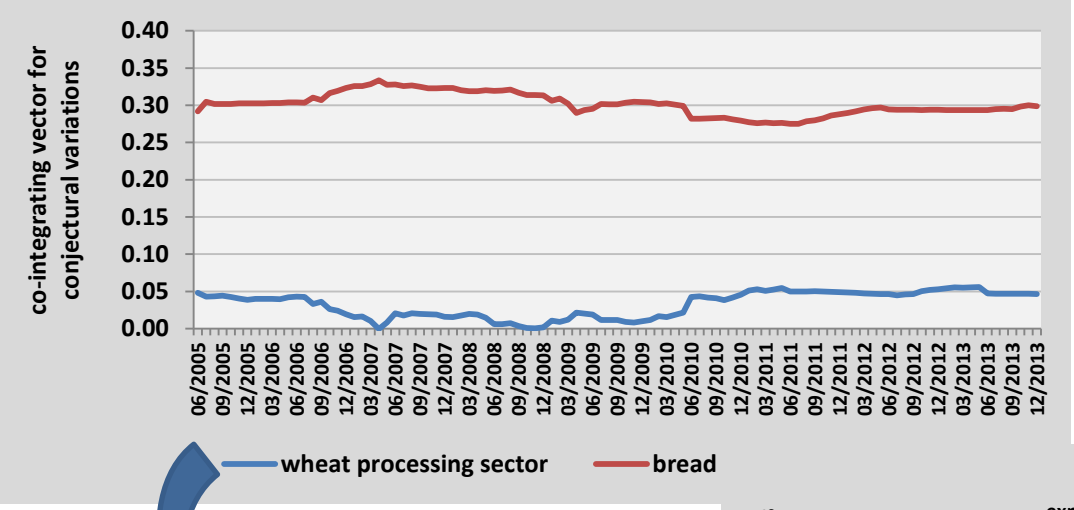
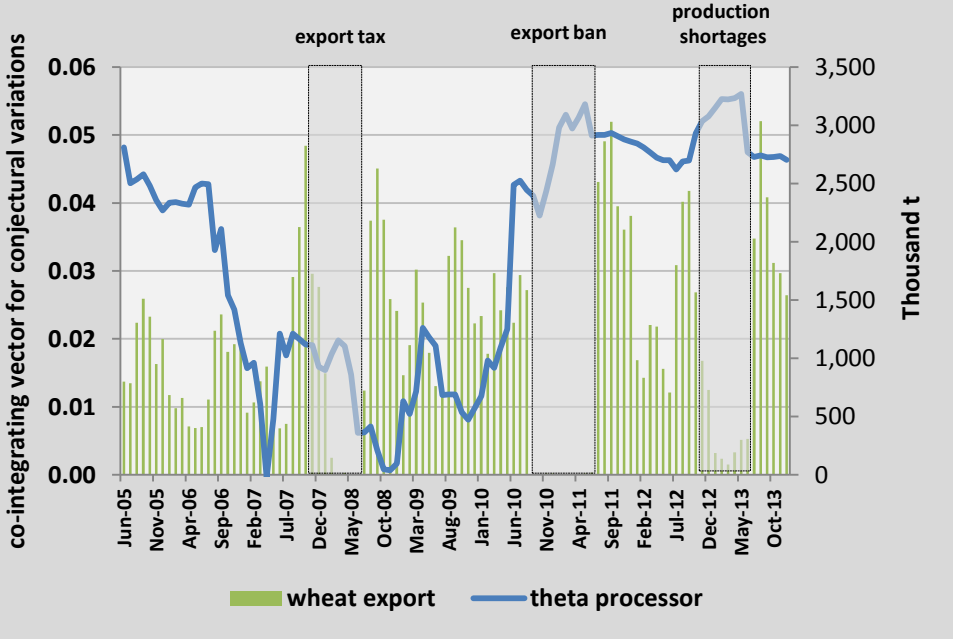
Market power indicators



Wheat-to-bread supply chain in Russia



Factors affecting price transmission / Conclusions

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- **Import dependency**

  Domestic producers face strong competition
  (higher imports – faster adj. of producer prices – lower adj. of retail prices);

- **Underdeveloped processing sector**

  For most of the CIS countries;

- **Fast development of the retail sector**

  Possible exercise of market power
  (e.g. Russian wheat-to-bread supply chain);

- **Domestic trade and price regulations**

  Strong impact on price adjustments
  (affects both producers and retailers).

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Thank you for your attention !

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