EXPORT RESTRICTIONS ON WHEAT MARKETS IN SERBIA DURING GLOBAL COMMODITY PRICE PEAKS – DID CONSUMERS REALLY BENEFIT?

Ivan Djuric, Linde Götz and Thomas Glauben

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- NEW RULES OF TRADE -
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Global commodity price peaks 2007/08 and 2010/11

- Significant price increase of cereals and other commodities (since 2007).

Source: World Bank
• Significant price increase of cereals and other commodities (since 2007).
Global commodity price peaks 2007/08 and 2010/11

- Many countries intervened on their domestic markets, mainly by implementing some type of export restrictions

**Types of export restrictions:**
- Export tax
- Export quota
- Export ban

**Aim:**
- Reduce exports induced by high world market prices
- Increase domestic supply
- Dampen domestic food prices
Policy interventions – wheat and flour markets (Serbia)
Policy interventions – wheat and flour markets (Serbia)

Wheat market:
1. Wheat export ban (August 2007)
2. Governmental buy-out (September 2007)
3. Export ban – 1st extension (October 2007)
4. Export ban – 2nd extension (February 2008)
5. Governmental buy-out (March 2008)
6. Wheat import tariff was abolished (March 2008)
7. Wheat export ban was cancelled (June 2008)
Policy interventions – wheat and flour markets (Serbia)

Introduction

Policies

Research questions

Empirical strategy and results

Conclusions

Data

Policy interventions

2007/2008

Wheat market:

1. Wheat export ban (August 2007)
2. Governmental buy-out (September 2007)
3. Export ban – 1st extension (October 2007)
4. Export ban – 2nd extension (February 2008)
5. Governmental buy-out (March 2008)
6. Wheat import tariff was abolished (March 2008)
7. Wheat export ban was cancelled (June 2008)

Flour market:

1. Flour export quota (October 2007)
2. Additional export quota (February 2008)
3. Flour export quota was cancelled (June 2008)
Policy interventions – wheat and flour markets (Serbia)

Wheat market:
1. Wheat export ban (March 2011)
2. Wheat import tariff was abolished (March 2011)
3. Wheat export ban was cancelled (June 2011)
Policy interventions – wheat and flour markets (Serbia)

Policy interventions 2011

Wheat market:
1. Wheat export ban (March 2011)
2. Wheat import tariff was abolished (March 2011)
3. Wheat export ban was cancelled (June 2011)

Flour market:
1. Flour export ban (March 2011)
2. Flour export quota (March 2011)
3. Flour export quota was cancelled (June 2011)
Policy interventions – bread market (Serbia)

Price increasing events 2007/2008
1. First price increase (August 2007)
2. Second price increase (November 2007)
3. Third price increase (April 2008)

Policy interventions 2010/2011
1. Fixed trade margin (October 2010)
2. Fixed bread price (April 2011)
The main objective:

to identify the effects of Serbia’s crisis policy on domestic wheat-to-bread supply chain during the global commodity price peaks and food crisis in 2007/08 and 2010/11.
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to identify the effects of Serbia’s crisis policy on domestic wheat-to-bread supply chain during the global commodity price peaks and food crisis in 2007/08 and 2010/11.

Hypothesis:

• The state of the Serbian wheat-to-bread supply chain changed due to the comprehensive governmental market interventions during the observed crisis periods;

• Consumers bear the biggest burden caused by the crisis and governmental interventions.
Research questions

1) Did the governmental interventions in 2007/08 and 2010/11 influence the price transmission along the wheat-to-bread supply chain in Serbia?

2) Who benefitted/lost from the governmental interventions?
<table>
<thead>
<tr>
<th>Stage wheat-to-bread supply chain</th>
<th>Research question 1: Price transmission</th>
<th>Research question 2: Welfare effects</th>
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<tr>
<td>Mills to bakeries (wheat to flour)</td>
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# Research approach

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## Price transmission

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Price transmission analysis: model

Full Markov-Switching *unrestricted* VECM specification:

\[
\Delta p_t^f = v(s_t) + \alpha(s_t) p_{t-1}^f + \delta(s_t) p_{t-1}^w + \sum_{i=1}^{k} A_i(s_t) \Delta p_{t-i}^f + \sum_{j=0}^{l} B_j(s_t) \Delta p_{t-j}^w + \varepsilon_t
\]

- \( \alpha \) - speed of adjustment
- \( A_i, B_j \) - short-run price transmission parameters
- \( \beta_1 = -\frac{\delta}{\alpha} \) - long-run price transmission
- \( s_t \) - state variable (unobserved)
Price transmission analysis: results

Regime classification for MS(2)-VECM(2)

![Graph showing regime classification for MS(2)-VECM(2)]
## Price transmission analysis: results

### Selected parameter estimates MS(2)-VECM(2)

<table>
<thead>
<tr>
<th>Market</th>
<th>Indicator</th>
<th>“normal” regime</th>
<th>“deterioration” regime</th>
</tr>
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<tbody>
<tr>
<td><strong>long-run price transmission</strong></td>
<td>Elasticity ($\beta_1$)</td>
<td>0.908* (0.092) $^a$</td>
<td>0.598 (0.402) $^a$</td>
</tr>
<tr>
<td></td>
<td>Constant ($\beta_0$)</td>
<td>1.293</td>
<td>4.142</td>
</tr>
<tr>
<td><strong>equilibrium</strong></td>
<td>Regime specific avg. ECT</td>
<td>-0.0179</td>
<td>0.1136</td>
</tr>
<tr>
<td>deviation from equilibrium</td>
<td>Speed of adjustment $^b$</td>
<td>-0.1126**</td>
<td>-0.0181</td>
</tr>
<tr>
<td>adjustment dynamics</td>
<td>Residual standard error $^b$</td>
<td>0.0354</td>
<td>0.0115</td>
</tr>
<tr>
<td><strong>stability</strong></td>
<td></td>
<td></td>
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<tr>
<td>price fluctuation</td>
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$^a$ difference from the perfect price transmission ($\beta=1$), in absolute values.

$^b$ regarding the most probable price transmission regime prevailing in this time period.

* indicates statistical significance at 5%.

** indicates statistical significance at 1%.
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<tr>
<td>1</td>
<td>Production costs simulations (flour)</td>
<td>flour diff. types</td>
<td>F.C.A. mill selling price</td>
<td>RSD</td>
<td>monthly</td>
</tr>
</tbody>
</table>

Welfare effects - millers’ profits (large mills)

- wheat price (stored wheat)
- millers’ revenue
Welfare effects - millers’ profits (large mills)

millers’ revenue – stored wheat
Welfare effects - millers’ profits (large mills)

\[
\text{millers' profit/loss} = \text{millers' revenue} - \text{stored wheat} - \text{packaging costs}
\]
Welfare effects - millers’ profits (small mills)

millers’ profit/loss = millers’ revenue – wheat spot market price – packaging costs
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<tr>
<td>1</td>
<td>Laissez-faire policy</td>
<td>wheat</td>
<td>EXW silo selling price (Hungary – world market)</td>
<td>RSD</td>
<td>weekly</td>
</tr>
</tbody>
</table>
Assumptions:

- Millers’ profits calculated based on:
  - World wheat market price (wheat spot market price/stored wheat)
  - Simulated flour prices according to MSVECM results:

\[
\begin{align*}
   p^f_t &= \beta_0^{reg1} + \beta_1^{reg1} \times p^w_t \\
   p^f_t &= \beta_0^{reg2} + \beta_1^{reg2} \times p^w_t
\end{align*}
\]
Welfare effects - millers’ profits (laissez-faire policy)

### Large mills

**Graph Description:**
- **X-axis:** Months from Sep-07 to Jan-11
- **Y-axis:** in RSD/kg
- **Lines:**
  - Red line: Mills' profit (basis: world mkt p. stored w.)
  - Blue line: Mills' profit (basis: Serbian p. stored w.)
  - Red dotted line: World market price stored wheat
  - Blue dotted line: Serbian price stored wheat

Legend:
- Mills' profit (basis: world mkt p. stored w.)
- Mills' profit (basis: Serbian p. stored w.)
- World market price stored wheat
- Serbian price stored wheat

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**References:**
- IAMO: Leibniz Institute of Agricultural Development in Central and Eastern Europe

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**Empirical strategy and results**
Welfare effects - millers’ profits (laissez-faire policy)

Large mills

- Mills' profit (basis: world mkt p. stored w.)
- Mills' profit (basis: Serbian p. stored w.)
- World market price stored wheat
- Serbian price stored wheat
Welfare effects - millers’ profits (laissez-faire policy)

Small mills

Mills' profit (basis: world spot mkt. p. w.)
Mills' profit (basis: Serbia spot mkt. p. w.)
world spot market price wheat
Serbian spot market price wheat
Welfare effects - millers’ profits (laissez-faire policy)
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<td>Production costs simulations (bread)</td>
<td>bread end consumer price</td>
<td>RSD</td>
<td>monthly</td>
<td>75</td>
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Bread production costs (large bakeries)

Export ban (08/07-06/08)

- large bakeries' production costs
- "pretended" bread production costs
- bread end consumer price
Bread production costs (large bakeries)

Export ban (08/07-06/08)

- "pretended" bread production costs
- simulated bread production costs (laissez-faire)
- bread end consumer price
Bread production costs (large bakeries)

Export ban (08/07-06/08)

- "pretended" bread production costs
- simulated bread production costs (laissez-faire)
- bread end consumer price
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Distributable bread margin

![Graph showing distributable bread margin over time with an export ban highlighted from 08/07-06/08.](graph.png)

- **baker's loss**
- **distributable surplus**
- **distributable bread margin**
- **min. retailer margin**

Export ban
(08/07-06/08)
**Distributable bread margin**

![Graph showing distributable bread margin over time](image)

- **Export ban**
  - (08/07-06/08)

- **Variables:**
  - **baker's loss**
  - **distributable surplus**
  - **distributable bread margin**
  - **min. retailer margin**
Distributable bread margin

Export ban
(08/07-06/08)
Conclusions

Who benefitted, who lost from the governmental interventions?

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<th>Farmers</th>
<th>Intermediate actors</th>
<th>Consumers</th>
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<tr>
<td></td>
<td>Large/small Mills</td>
<td>Large Bakeries</td>
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<tr>
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<td>+</td>
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• Results make evident that welfare effects for consumers are influenced by:
  – price behaviour of intermediate actors, i.e. mills, bakeries and retailers;
  – additional policy measures (governmental purchases), wrong sequencing, i.e. policy failure;

• Export ban as an effective means to dampen domestic food inflation is highly questionable:
  – vulnerable to policy failure;
  – can easily be counteracted by behavior of actors in the supply chain;
  – might rather foster food inflation;
  – similar developments: Kazakhstan 2007/2008; Russia 2010/11.
Thank you for your attention!

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