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Price Transmission on Wheat Flour Market in Georgia

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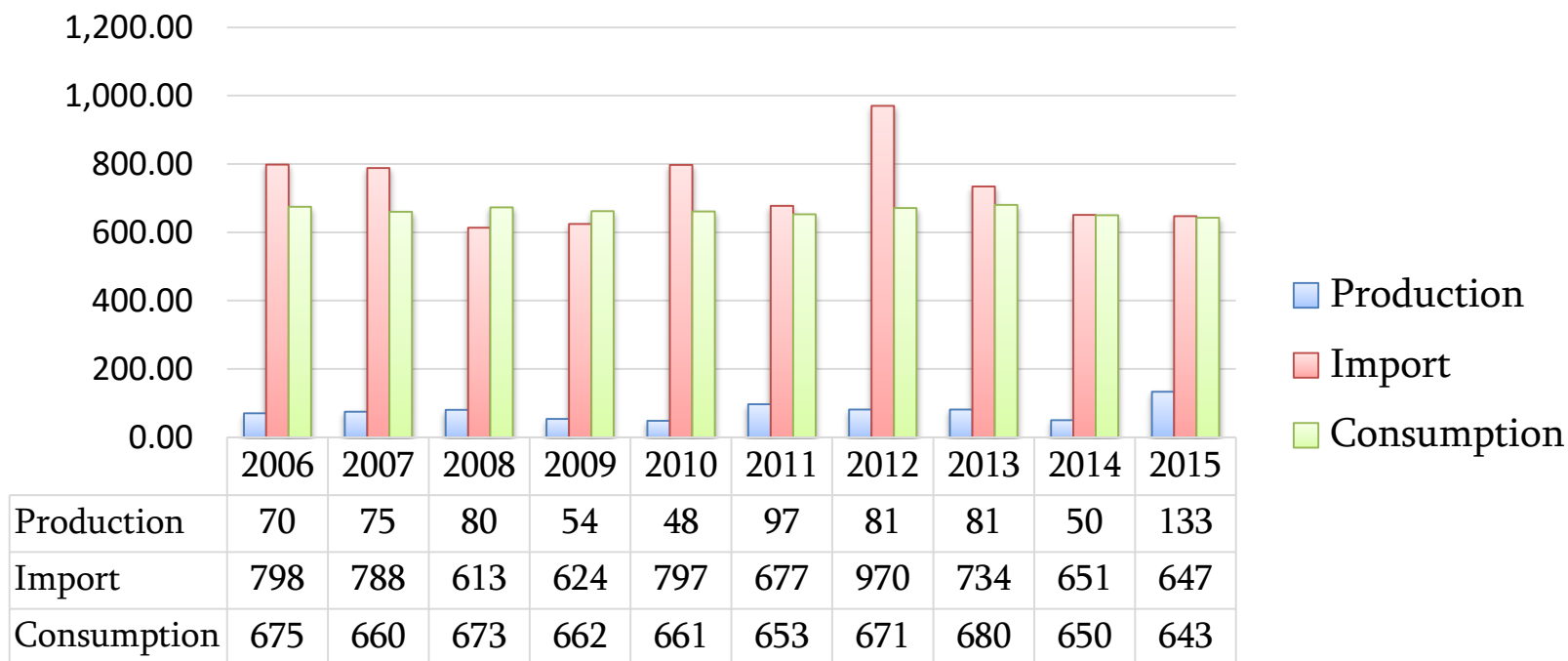
Outline:

- Introduction
- Georgian Wheat Market
- Data and Methodology
- The Main Findings
- Outlook

- Georgia is a traditional agricultural country. Nearly half of the population lives in rural areas, where a low-input, subsistence and semi-subsistence farming is a major source of livelihood
- The share of agriculture in total GDP declined significantly (from 25% in 1999 to about 9.2% in 2015)
- The percentage of the workforce classified as employed in agriculture has remained fairly constant, 52.1% in 2000, 53.1% in 2011, and 46% in 2015

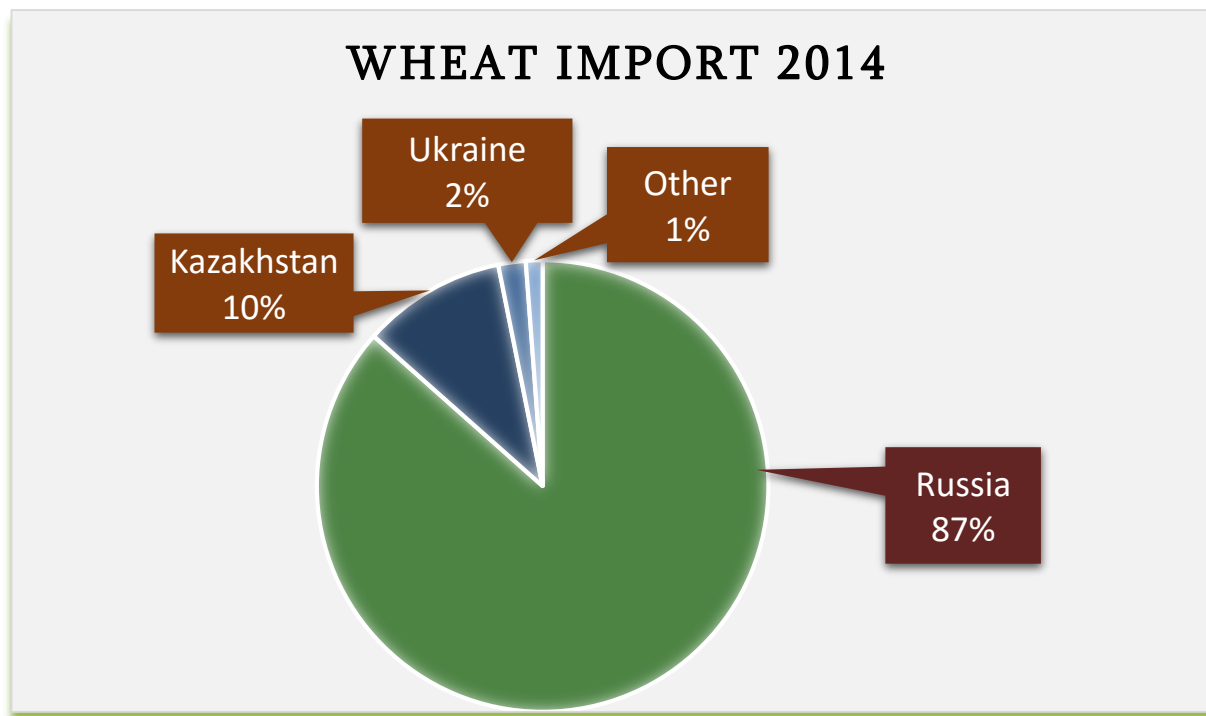
- On the other side, the country is highly dependent on imports. In particular, share of wheat import in total consumption is around 85% much more than in Armenia and Azerbaijan.
- Wheat is important for food security in Georgia
- Wheat and its products are the main staple foods both in rural and urban areas in Georgia. It accounted for 41% of the total dietary energy supply in 2005-07.
- On average in 2005-09 per capita consumption (as food) of wheat and wheat products was 150 kg/yr.

Wheat(Ths. tons)



Source: National Statistics Office Georgia

- Mostly Georgia imports wheat predominantly from Black Sea region, namely from Russia, Ukraine and Kazakhstan



- Local millers are the important players on the flour market. There are about 54 flour mill plants in Georgia
- Out of these, 13 are large flour mills
- “Karat Holding”, an Azeri company, holds 3 large scale mill plants in Georgia, which daily produce around 1400 tons of flour. This constitutes about 40% of the flour market

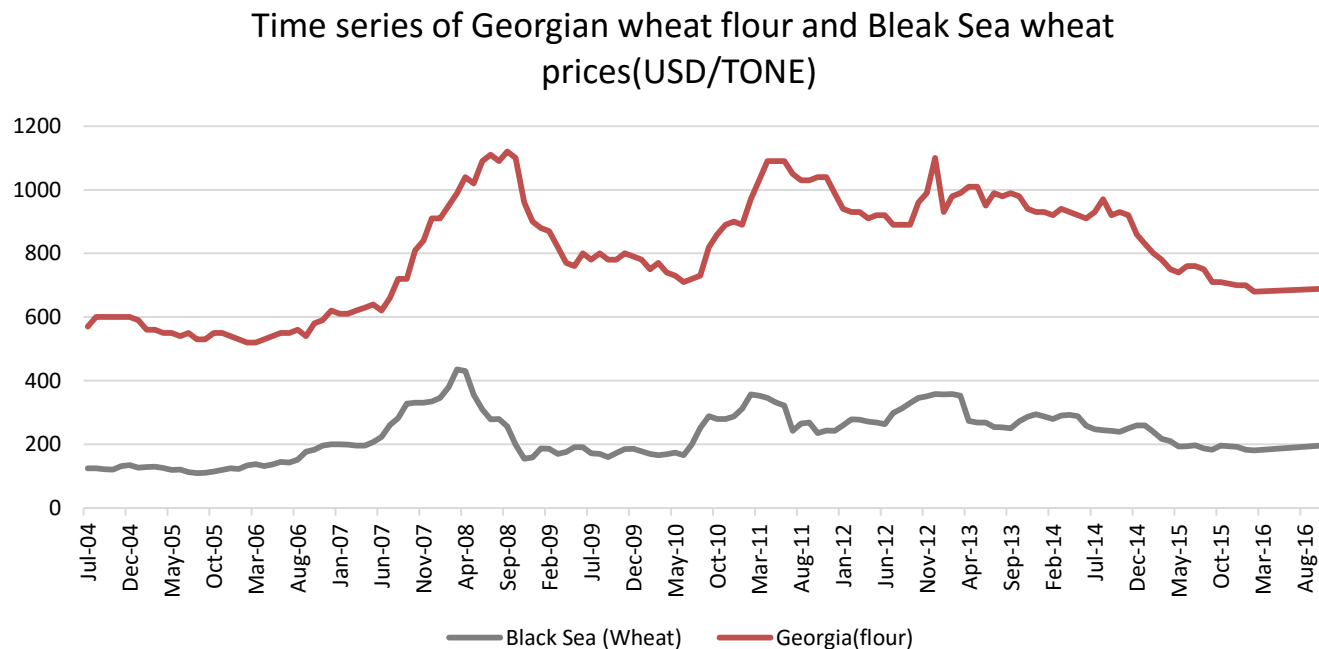
- Understanding:
 - ✓ Wheat market integration of Georgia with Black Sea market is of high importance due to the prevalence of high food insecurity
 - ✓ Transmission of price shocks from the world market to domestic markets
- In this research we focus on local(Georgian) flour market to understand how price shocks on world wheat market are reflected into flour price in Georgia while it challenges food security of the country

Why prices might not be transmitted perfectly?

- High transportation cost and/or other trade barriers make trade unprofitable
- Goods are imperfect substitutes (e.g., imported wheat and local wheat)
- Lack of information about prices in other markets
- Transportation from one market to another takes long time(lagged transmission)

- FAO GIEWS provides monthly wheat flour national average prices for Georgia with 141 observations starting from December 2004 to February 2016 and world market prices (Black Sea) for the same period
 - Georgia: national average wheat flour (high grade), retail
 - International prices: Black Sea wheat (Russia, Ukraine, Kazakhstan)

- Graphical representation of two time series shows a possible long-term connection between the Georgian and Black Sea prices



- VECM are used to study price transmission
- The data show the existence of rank 1 cointegration. This can be interpreted as an existence of a long-run relationship between Georgian wheat flour and Black Sea wheat prices (I(1) processes).
- As Georgia is a small country it is obvious that Georgian wheat flour prices do not have impact on international wheat prices and we have a case of price taker.
- Granger causality test (Granger, 1969) is performed with null hypothesis of having no causality. This test implied that Georgian wheat flour prices do not Granger cause Black Sea wheat prices.

The Main Findings

The long run relationship between prices in Georgia and Black Sea are following:

$$\ln dom_t = 2.812 + 0.718 \ln Int_t$$

- As analysis were conducted using natural logarithms we can interpret 0.72 as long run elasticity of transmission between these two prices. So, 1 percentage point increase in Black Sea wheat price would lead to corresponding 0.72 percent price increase of flour in Georgia.

The Main Findings

VECM Estimation Results

- VECM results for these prices (*dom*= flour, *Int*= wheat, estimated with two lag, prices in logarithms)

$$\begin{bmatrix} d(\ln dom)(t) \\ d(\ln int)(t) \end{bmatrix} = \begin{bmatrix} -0.143 \\ -0.852 \end{bmatrix} \begin{bmatrix} 1.000 & -0.718 \\ \ln dom(t-1) \\ \ln int(t-1) \end{bmatrix} + \begin{bmatrix} -2.812 \\ \text{CONST} \end{bmatrix} + \begin{bmatrix} -0.109 & 0.076 \\ -0.216 & 0.390 \end{bmatrix} \begin{bmatrix} d(\ln dom)(t-1) \\ d(\ln int)(t-1) \end{bmatrix} + \begin{bmatrix} 0.109 & -0.006 \\ -0.038 & -0.145 \end{bmatrix} \begin{bmatrix} d(\ln dom)(t-2) \\ d(\ln int)(t-2) \end{bmatrix} + \begin{bmatrix} u_1(t) \\ u_2(t) \end{bmatrix}$$

Adjustment
parameters

Long run coefficient of
price transmission

- The magnitudes of the adjustment parameters suggest that Georgian flour prices react to international wheat prices and not vice versa. This is also what we would expect (wheat prices in Georgia are largely determined by world market conditions and policies which are largely exogenous to conditions in the milling industry)
- As analysis showed roughly 14% of deviation from long run equilibrium is corrected in one period. Our data is monthly and 4 months is needed to correct more than half of the deviation and 7 months to fully adjust.

- Due to results of Engle-Granger ECM there is no asymmetry in price transmission and both negative and positive shocks transmit to the Georgian market within 7 months period.
- This kind of results can be found in case of competitive markets

Limitations of the VECM:

- Not structural, only uses prices, no consideration of trade flows or transaction costs
- The existence of non-competitive market?

Thank you