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# SPATIAL INTEGRATION OF WHEAT MARKETS IN THE REGIONS OF SOUTH CAUCASUS AND CENTRAL ASIA: EVIDENCE FROM ARMENIA, AZERBAIJAN, GEORGIA AND KYRGYZSTAN

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# **SPATIAL INTEGRATION OF WHEAT MARKETS IN THE REGIONS OF SOUTH CAUCASUS AND CENTRAL ASIA: EVIDENCE FROM ARMENIA, AZERBAIJAN, GEORGIA AND KYRGYZSTAN**

## **Abstract**

Efficient functioning of grain markets is a very important component of food security in South Caucasus and Central Asia. Wheat provides almost half of total daily calories of the population in those food-insecure countries. We examine the degree of integration of wheat markets in South Caucasus and Central Asia with world wheat markets employing linear and threshold cointegration models. Estimation results indicate that markets in South Caucasus region function significantly more efficiently than in Central Asian countries. In addition, reduction of trade costs is critical for Central Asia as it hinders efficient functioning of wheat markets. Improvement of the transport infrastructure would improve food security particularly for the vulnerable population in these countries.

## **Keywords**

Food security, price transmission, trade costs, wheat, Central Asia, South Caucasus.

## **1 Introduction and research questions**

Recent increases in global food prices and its pronounced volatility have renewed the research interest in analyzing the pattern and magnitude of transmission of price shocks from the world market to domestic markets. In this study we focus on local wheat markets in South Caucasus and Central Asia which were confronted with repeated price shocks on world wheat markets during the last decade which challenged food security in these countries.

Wheat is an important product generating around 40%-50% of total daily calories in these countries which heavily depend on grain imports. Most of the wheat demand in South Caucasus and Central Asia is covered by import, primarily (more than 90%) from the countries of the Black Sea region, i.e. Kazakhstan, Russia and Ukraine. To assess how well wheat markets in these regions are functioning we study the degree of South Caucasian and Central Asian wheat markets integration with the world wheat markets. Furthermore, we examine the role of trade costs in the integration of those markets since it could have a significant implication for food security in South Caucasus and Central Asia.

## **2 Data and empirical methods**

In our study we use monthly producer prices for domestic markets in South Caucasus and Central Asia and export prices for world wheat markets in the time period 2006-2014. We cover all the countries of the South Caucasus region, i.e. Armenia, Azerbaijan and Georgia. However, due to the scarcity of available data, we present empirical results only for Kyrgyzstan from Central Asian region. We select FOB prices of Kazakhstan, Russia and Ukraine as the most relevant world market prices. We also include USA and EU (represented by France) in our study since prices observed at the CBOT and the MATIF commodity exchanges play a large role for price determination on wheat markets in the Black Sea region, according to the information of traders.

Cointegration and error correction model approaches serve as the econometric framework for our price transmission analysis. Based on the results of different linear and threshold cointegration tests (ENGLE and GRANGER, 1987; JOHANSEN, 1988; HANSEN and SEO, 2002;

LARSEN, 2012) we use a linear error correction model (ENGLE and GRANGER, 1987) and a threshold error correction model (GOODWIN and PIGGOTT, 2001) to study wheat market integration and the impact of trade costs on the functioning of South Caucasian and Central Asian wheat markets. The threshold error correction model is estimated making use of the regularized Bayesian technique (GREB ET AL., 2013), which has better properties compared to commonly used maximum likelihood method of estimation.

### **3 Empirical results and conclusions**

Results of the price transmission analysis indicate that markets in the South Caucasus region function more efficiently. Price transmission elasticities with the world wheat market vary in the range of 0.50 and 0.80 and the speed of adjustment parameters lay between -0.15 and -0.39. In contrast, there is no evidence of Central Asian wheat market integration with any of the studied export market, except Kazakhstan. Besides, our analysis identify price transmission elasticities and speed of adjustment parameters for price relationships between South Caucasus wheat markets and the EU and USA of similar size as with the markets of the Black Sea region. We interpret these results as evidence for the importance of information transfer from EU and USA markets for market integration in the South Caucasus region comparable to the direct trade with the markets in the Black Sea region.

Furthermore, results of the threshold cointegration tests do not provide evidence for the existence of thresholds (which we interpret as a proxy for transaction costs) between South Caucasian and international wheat markets. Contrasting, they suggest that trade costs are highly relevant for the wheat trade of the Central Asian markets countries. In addition, we observe more pronounced price volatility on Central Asian markets compared to South Caucasus, which in combination with higher trade costs, negatively influences food security in those countries. Therefore, the reduction of trade costs in Central Asia is critical to improve the functioning of grain markets, which could be achieved by investing in transportation infrastructure and storage facilities.

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