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***SAMARKAND Conference***  
2-4 November 2016, Uzbekistan

***MATRACC Project: Regional Trade and Supply Chains  
(IAMO Organized Session)***

***Oleksandr Perekhozhuk***  
***IAMO, Germany***

# IAMO Organized Session

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Wednesday, November 2, 2016, 17:30 - 19:00, Lecture Hall

Session Chair: **Oleksandr Perekhozhuk**

**MATRACC Project: An Overview of Empirical Methods and Results**

Oleksandr Perekhozhuk (IAMO, Germany)

**Comparative Analysis of Wheat Supply Chains in Armenia and Uzbekistan**

Ihtiyor Bobojonov (IAMO, Germany)

**CIS what market integration**

Ivan Djuric (IAMO, Germany)

**Measuring the Degree of Oligopsony Power in Kazakh Grain Processing**

**Industry: Evidence from GIM Approach**

Giorgi Chezha (IAMO, Germany)

***SAMARKAND Conference***  
2-4 November 2016, Uzbekistan

***MATRACC Project:  
An Overview of Empirical Methods and Results***

***Oleksandr Perekhozhuk***  
***IAMO, Germany***

# Project Overview

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## **Project topic:**

- The Global Food Crisis – Impact on Wheat Markets and Trade in the Caucasus and Central Asia and the Role of Kazakhstan, Russia and Ukraine (MaTraCC)

## **Funding organization:**

- Volkswagen Foundation (Volkswagen-Stiftung), Germany

## **Funding period:**

- Five-year period from 2012 to 2017

## **Project staff:**

- 1 Post-Doc
- 6 PhD Students
- 6 IAMO Senior Researchers

# Project Partners

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- Leibniz Institute of Agricultural Development in Transition Economies (IAMO), **Germany**
- International Center for Agribusiness Research and Education (ICARE), **Armenia**
- The Fund "Georgian Center for Agribusiness Development" (GCAD), **Georgia**
- Analytical Center of Economic Policy in the Agricultural Sector (ACEPAS), **Kazakhstan**
- Higher School of Economics Moscow (HSE), **Russia**
- All-Russian Nikonov-Institute of Agrarian Problems and Informatics of the Russian Academy of Agricultural Sciences (VIAPI), **Russia**
- Samarkand Agricultural Institute (SAI), **Uzbekistan**
- Central Asia and Caucasus Association of Agricultural Research Institutions (CACAARI), **Uzbekistan**

# Working Groups and Sub-Projects

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## **WG-1: Transmission of Market Prices:**

- From the world market to the domestic markets in the KRU and CCA countries along the wheat supply chain (**SP-1**)
- Spatial price transmission between regional markets within a country (**SP-2**)

## **WG-2: Market Structure and the Supply Chain:**

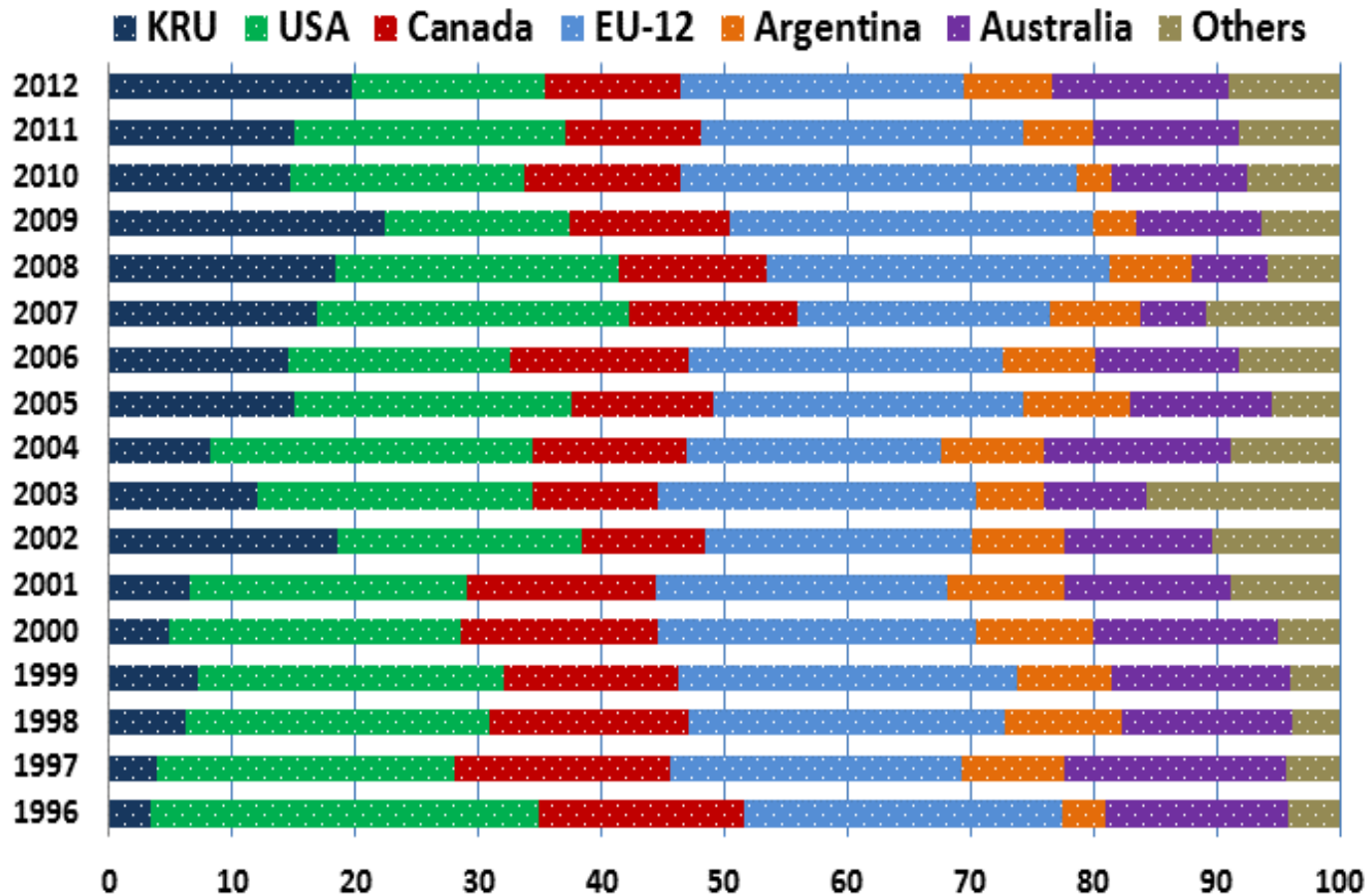
- Market interventions and regulations in the wheat supply chain of the CCA and KRU countries (**SP-3**)
- Comparative analysis of two suppliers (**SP-4**)
- Comparative analysis of two CCA countries (**SP-5**)

## **WG-3: Trade Patterns and Relationships:**

- Export pricing behavior of the KRU towards the CCA countries (**SP-6**)
- Impact on the trade pattern in terms of qualities and trading partners (**SP-7**)

# Background and motivation

Figure 1. Market shares of major wheat exporters in the world market (%)

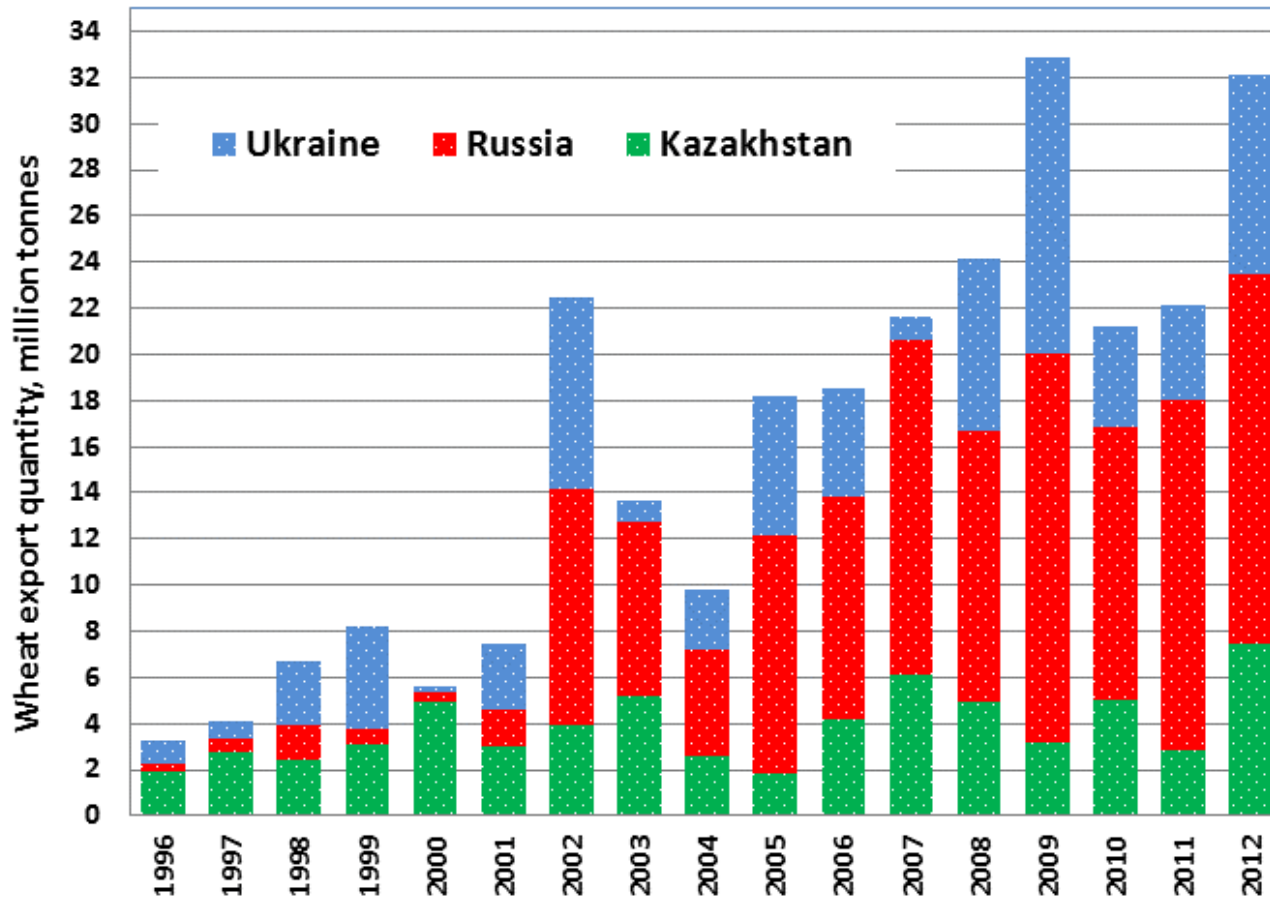


- KRU countries became world's largest wheat exporters;
- the shares of the world's main wheat exporters were significantly affected;
- the competition should be increased;

Source: Own calculations based on FAO statistics (1996-2011) and UN COMTRADE statistics (2012)

# Background and motivation (2)

Figure 2. Total wheat export quantity of KRU countries

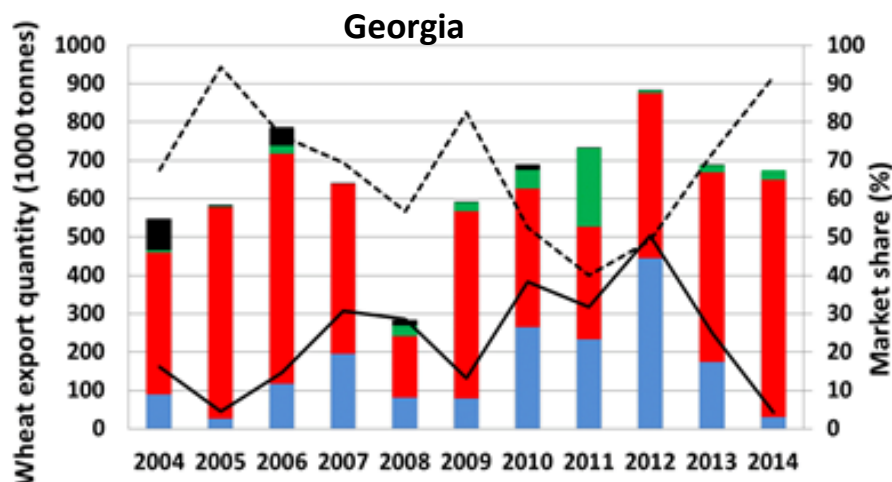
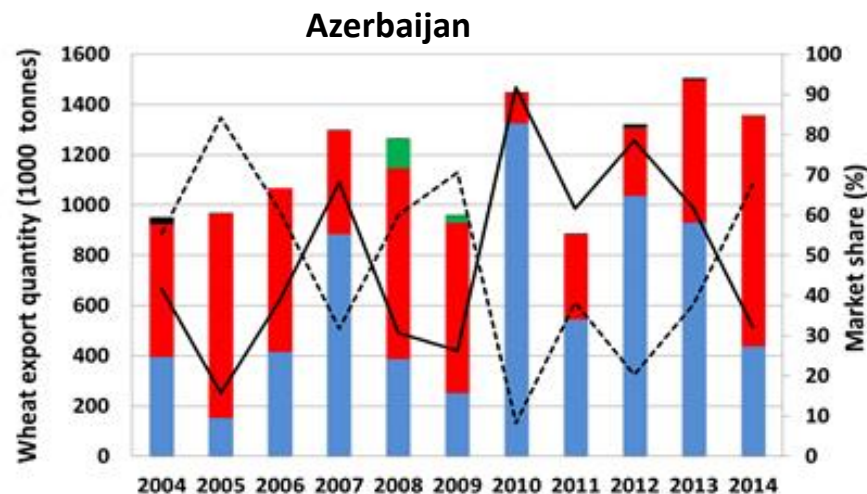
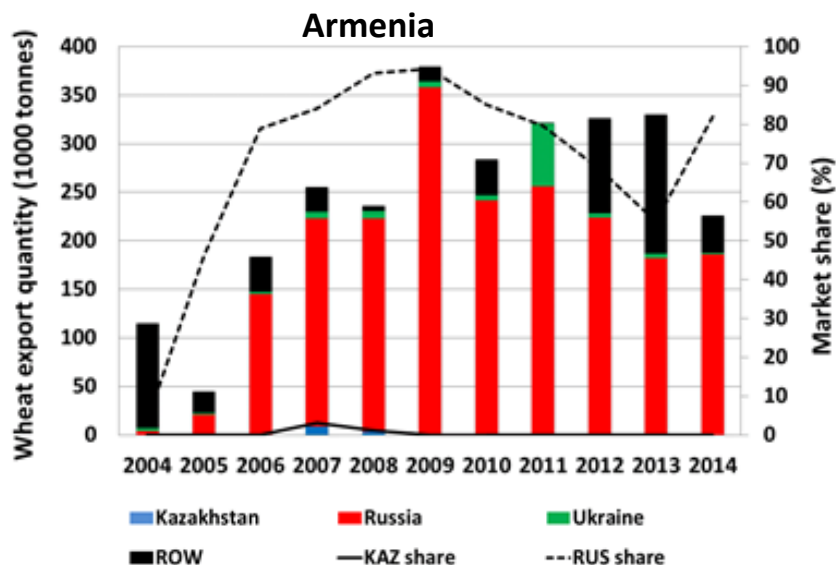


Source: Own calculations based on FAO statistics (1996-2011) and UN COMTRADE statistics (2012)

- Russia has developed into one of the leading actors in the world market;
- Russia annually exported between 11 and 17 million MT wheat;
- Kazakhstan exported between 3 and 7 million MT wheat;
- Ukraine exported between 4 and 12 million MT wheat;

# Background and motivation (3)

Figure 3. Wheat export quantity and market share of KRU countries in South Caucasian markets



- Market shares of Russian exporters in Armenia is 85% (on average), in Azerbaijan - 50%, and in Georgia - 75%;
- Market shares of Kazakh exporters in Azerbaijan is 50% and Georgia - 30%;

Source: Own contribution based on UN COMTRADE statistics

## **Objectives of Empirical Studies:**

- (1) to apply an econometric analysis of oligopolistic behaviour of Kazakh and Russian exporters;
- (2) to investigate whether Kazakh and Russian wheat exporters are able to exercise market power in South Caucasian wheat market;
- (3) to measure the extent of competition in Armenian, Azerbaijani and Georgian wheat markets.

# Approaches and methods

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Approaches and methods for the econometric analysis of market power in the international markets:

- **Pricing-to-Market (PTM)** approach introduced by Krugman (1986);
- **Residual Demand Elasticity (RDE)** approach developed by Baker and Bresnahan (1988);
- **General Identification Method (GIM)** demonstrated by Bresnahan (1982) and Lau (1982).

# Overview of RDE Studies

Authors (Year)	Export country/firm	Import country	Market/Product	Period	Data	Model	Method	Result
Baker & Bresnahan (1988)	Anheuser-Busch Coors Pabst	n/a	Beer	1962-1982	A	ME	3SLS	-0.31*** -0.75*** -0.06
Carter, MacLaren & Yilmaz (1999)	Australia Canada USA	Japan	Wheat	1970-1991	Q	SE	2SLS	-0.08 -0.49 -0.93***
Yang & Lee (2001)	Australia Canada USA China USA	South Korea	Wheat  Corn	1993-1999  1991-1999	Q	SE	IDM	-0.14** -0.15*** -0.38** -0.05 -0.03
Cho, Jin & Koo (2002)	USA	Indonesia Japan Korea Malaysia Philippines Singapore	Wheat	1973-1994	A	ME	SUR	-0.01 -0.11 -0.61*** -0.12*** -0.84*** -0.16***
Glauben & Loy (2003)	Germany	Canada France Unit. Kingdom USA	Beer	1991-1998	M	SE	IV	0.28 -0.71** 0.58*** 0.19*
Tasdogan, Tsakiridou & Mattas (2005)	Greece Italy Spain	EU	Olive Oil	1970-2001	A	SE	2SLS	-0.08** -0.36*** -0.16***

# Residual Demand Elasticity model

$$\ln P_{mt}^{ex} = \lambda_m + \eta_m \ln \hat{Q}_{mt}^{ex} + \alpha'_m \ln \mathbf{Z}_{mt} + \beta'_m \ln \mathbf{W}_{mt}^N + \varepsilon_{mt},$$

$P_{mt}^{ex}$  - export prices expressed in local currency of importing country;

$m$  - importing market/country;

$t$  - time trend;

$\lambda_m, \eta_m, \alpha', \beta'$  - estimating parameters;

$\hat{Q}_{mt}^{ex}$  - instrumented export quantity;

$\mathbf{Z}_{mt}$  - vector of demand shifters of  $m$  number of destinations (e.g. GDP of an importing country, time trend);

$\mathbf{W}_{mt}^N$  - vector of cost shifters (e.g. producer price of competing country, destination-specific exchange rate);

$N$  - number of competitors in a importing market/country;

$\varepsilon_{mt}$  - error term.

# Parameters of RDE model

The parameter  $\eta_m$  is coefficient of inverse residual demand elasticity:

- $\eta_m < 0$  indicate that the market for wheat is imperfectly competitive and the exporting country is a price maker.
- $\eta_m = 0$  indicate that the market for wheat is perfectly competitive and the exporting country faces a perfectly elastic demand curve.

The parameter  $\beta'$  is coefficient of cost shifters:

- $\beta' > 0$  indicate that wheat from a competing country is a perfect substitute to a wheat from a exporting country and means that these two countries compete in importing country and intervene with each other's market power;
- $\beta' < 0$  indicate that wheat from of the competing country is an imperfect substitute to a wheat from the exporting country.

# 3SLS results for Kazakhstan

Parameter	Variable	Azerbaijan	Georgia
$\eta_m$	EQ	-0.0122	-0.0131
$\beta$	ER KZT	1.1549***	0.0918***
$\beta$	ER RUB	-0.2312	-0.2450
$\beta$	ER UAH	0.1288	0.6123**
$\beta$	PP KAZ	0.5623***	0.4394***
$\beta$	PP RUS	0.5167***	0.2588**
$\beta$	PP UKR	0.1986*	0.2826***
$\alpha$	GDP	0.1261**	0.0785
$\alpha$	TIME	-0.0111*	0.0055
	Constant	-3.4184	-3.9729
	Obs.	42	42
	R-squared	0.9237	0.9291
	DW statistics	1.8879	1.9117

Notes: Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

# 3SLS results for Russia

	Variable	Armenia	Azerbaijan	Georgia
Parameter	EQ	-0.1510***	-0.0045	-0.0267*
$\eta_m$	ER KZT	-0.8345	0.7676*	0.0357*
$\beta$	ER RUB	0.7553	0.3308	0.3586
$\beta$	ER UAH	0.0128	0.0826	0.1766
$\beta$	PP KAZ	0.0647	0.0785	-0.0263
$\beta$	PP RUS	0.5203**	0.4978***	0.5089***
$\beta$	PP UKR	0.2983	0.2936***	0.3322***
$\beta$	GDP	0.4328***	0.0467	0.3101***
$\alpha$	TIME	-0.0140*	0.0033	-0.0080*
$\alpha$	Constant	-5.0993	2.2424	-5.5803***
	Obs.	39	39	39
	R-squared	0.7181	0.9280	0.9592
	DW statistics	2.1284	1.7237	1.4569

Notes: Asterisks \*\*\*, \*\* and \* denote statistical significance at the 1%, 5% and 10% levels, respectively.

# Summary and conclusions

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## **Residual demand elasticity parameter:**

- (1) Kazakh wheat exporter faces a perfectly elastic demand curve in Armenian and Georgian wheat markets, the market is perfectly competitive;
- (2) Russia has market power in Armenian and Georgian markets. Market power of Russian wheat exporters is much stronger in Armenia (markup 15.1%) than in Georgia (markup 2.7%) wheat market.

## **Cost shifter parameters:**

- (1) Both Kazakh and Russian exporters intervene to each other's market powers in Azerbaijani and Georgian markets;
- (2) Neither Kazakh, nor Ukrainian exporters are able to restrict Russian exporters' market powers in Armenian market;
- (3) Ukrainian exporters intervene both Kazakh and Russian exporters' market powers in Azerbaijani and Georgian markets. However, they constrain market powers more strongly in Georgia in compare to Azerbaijan;

# Summary and conclusions (2)

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## **Cost shifter parameters (continued):**

- (4) Kazakh exporters' market powers are constrained more effectively by Russian exporters in Azerbaijan, while by Ukrainian exporters in Georgia;
- (5) Russian exporters' market powers are constrained more effectively by Kazakh exporters in Azerbaijan, while by Ukrainian exporters in Georgia.

## **Demand shifter parameters:**

- (1) An increase in Azerbaijani GDP stimulate wheat exports from Kazakhstan;
- (2) An increase in Armenian and Georgian GDPs stimulate wheat exports from Russia.

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**Thank you for your attention**