

# How effective are export restrictions in Kazakhstan, Russia and Ukraine? Evidence from price transmission analyses

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# Introduction

Trade Policies & Effects

Method & Results

Conclusions



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## Large Former Soviet Union Grain Producers

### Commonwealth of Independent States



## Introduction

Trade Policies & Effects

Method & Results

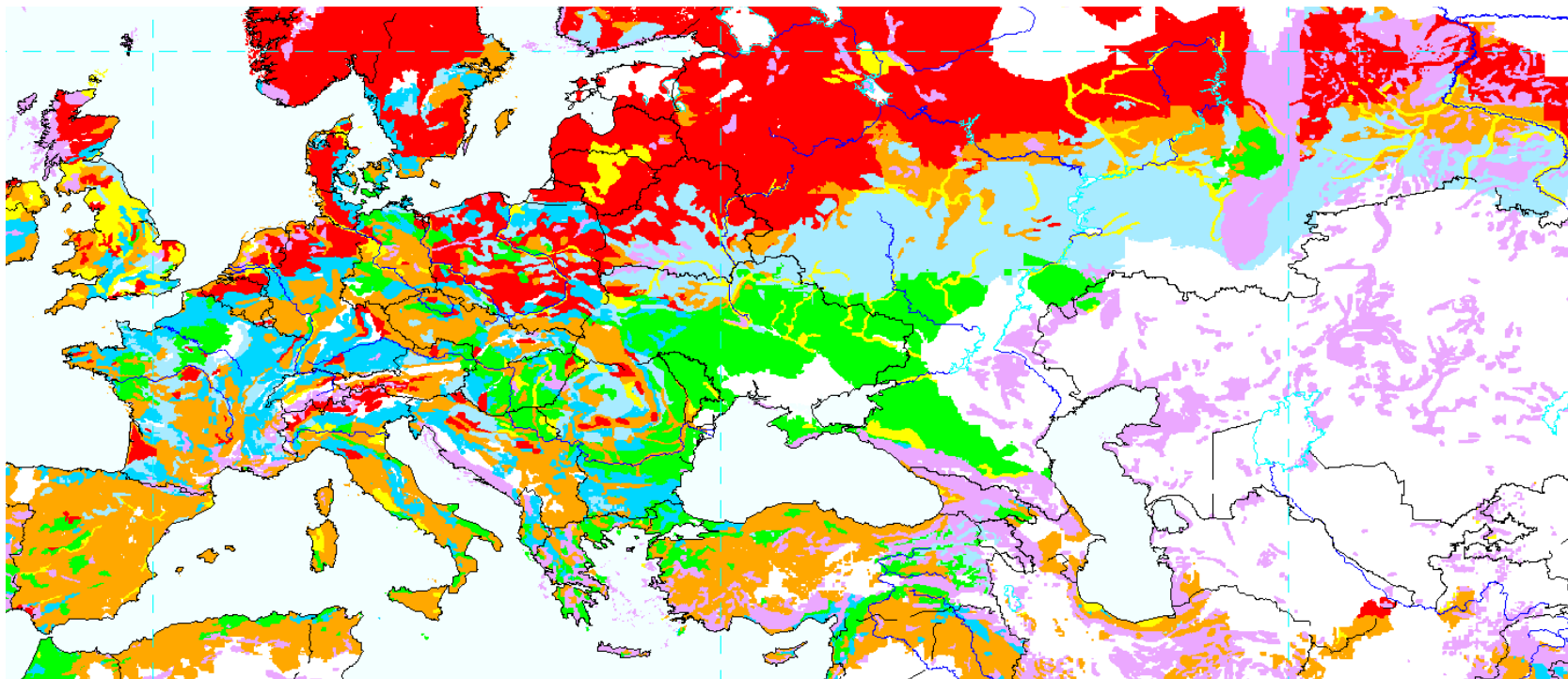
Conclusions



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# Large grain production potential KRU

Source: USDA (2009)



**Sources: 1) increase production efficiency;  
2) recultivate formerly abandoned land**

## Importance for global food security

- Global demand for cereals will reach 3 billion tons by 2050
  - Global grain production needs to increase by 30% (OECD/FAO 2012)
  - The KRU's share in world wheat exports amounts over 20% already today with about 35 million t
- **If the grain production potential can be mobilized depends on their agricultural policies**

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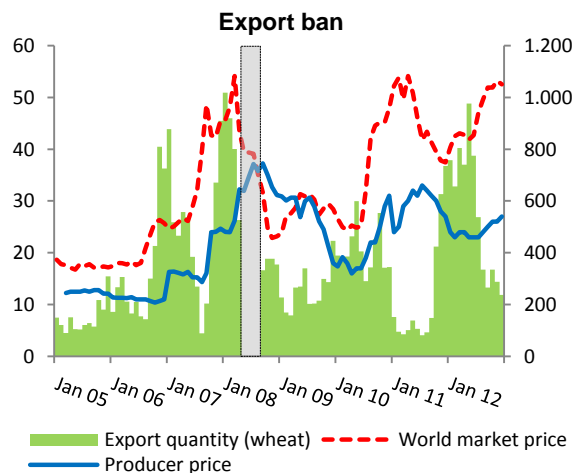


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# Export controls in the KRU

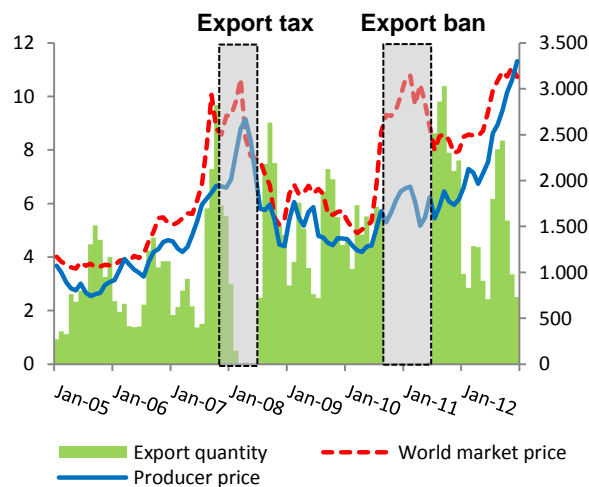
## Kazakhstan

- Export ban 2008



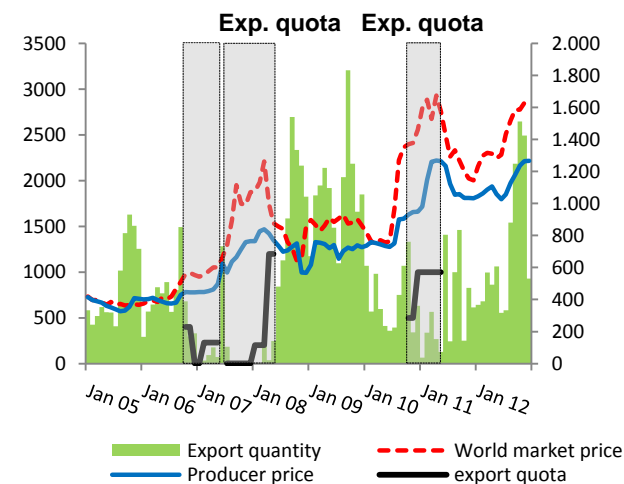
## Russia

- Export tax 2007-08
- Export ban 2010-11



## Ukraine

- Export quota 2006-07
- Export quota 2007-08
- Export quota 2010-11



## Export restrictions & WTO

- Article XI of the GATT 1994 requires Members to eliminate all prohibitions and quantitative restrictions on exports:

export tax	export quota	export ban
✓	X	X

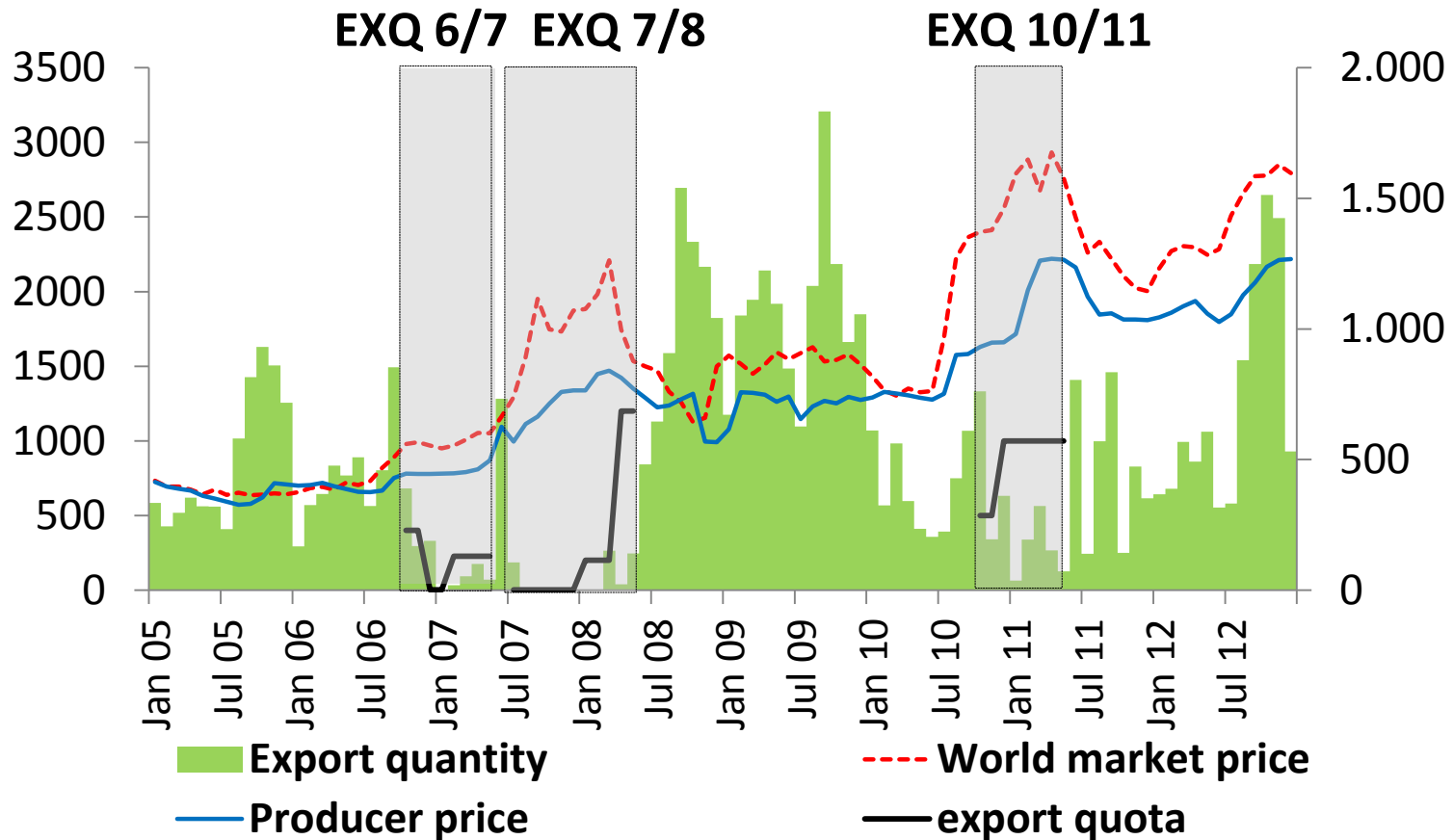
- Exceptions: „the prohibition on export restrictions does not extend to restrictions temporarily applied to prevent or relieve **critical shortages of foodstuffs** or other products essential to the exporting contracting party“

## Research questions & approach

- **How did export controls effect domestic wheat prices in the KRU?**
- **Are there differences in those effects between the KRU countries and how can they be explained?**
  - Develop indicators for the effectiveness of export controls
  - Utilize a price transmission model approach:  
price relationship domestic price – world market price

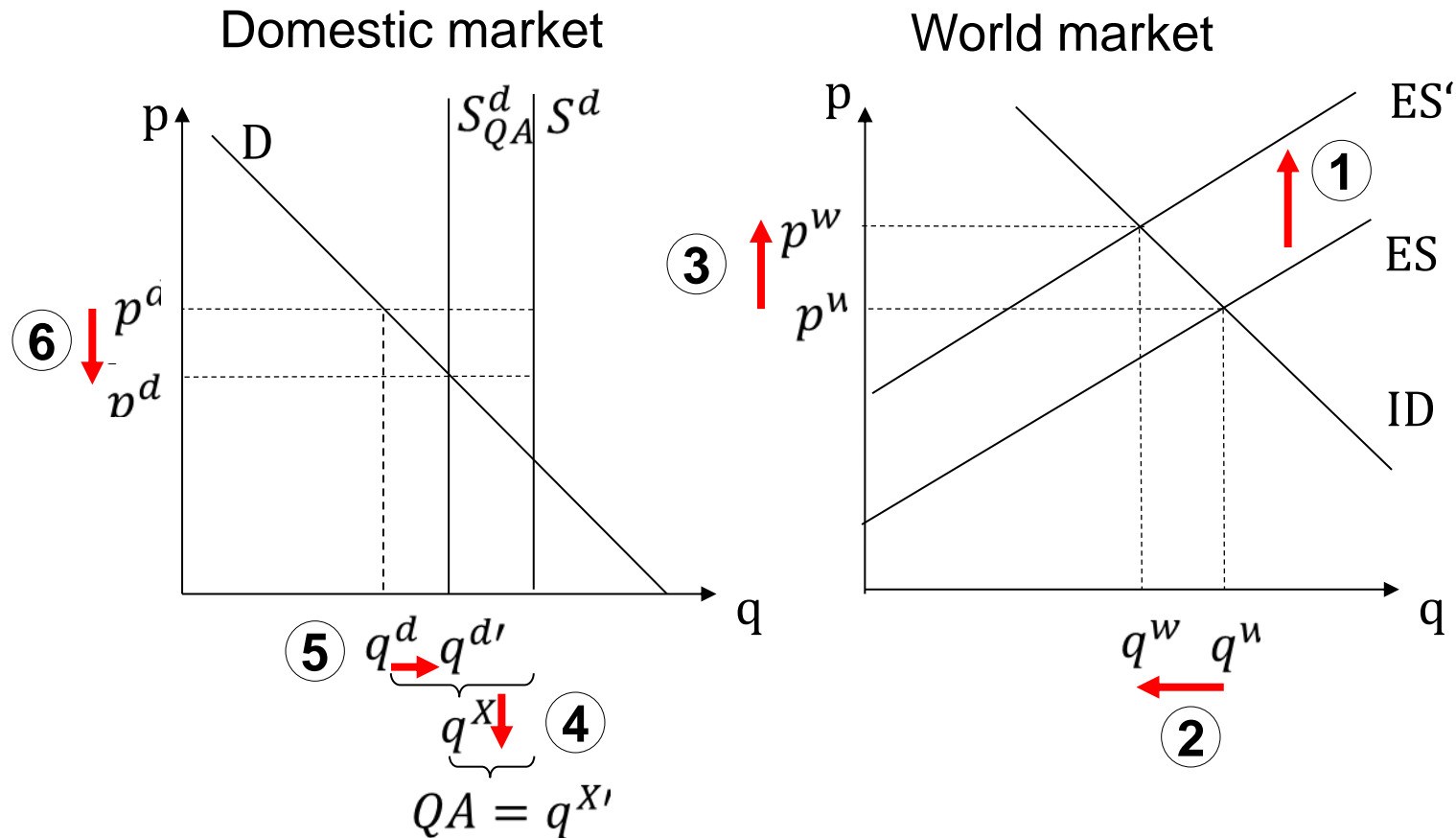


## Export controls in the KRU: Ukraine

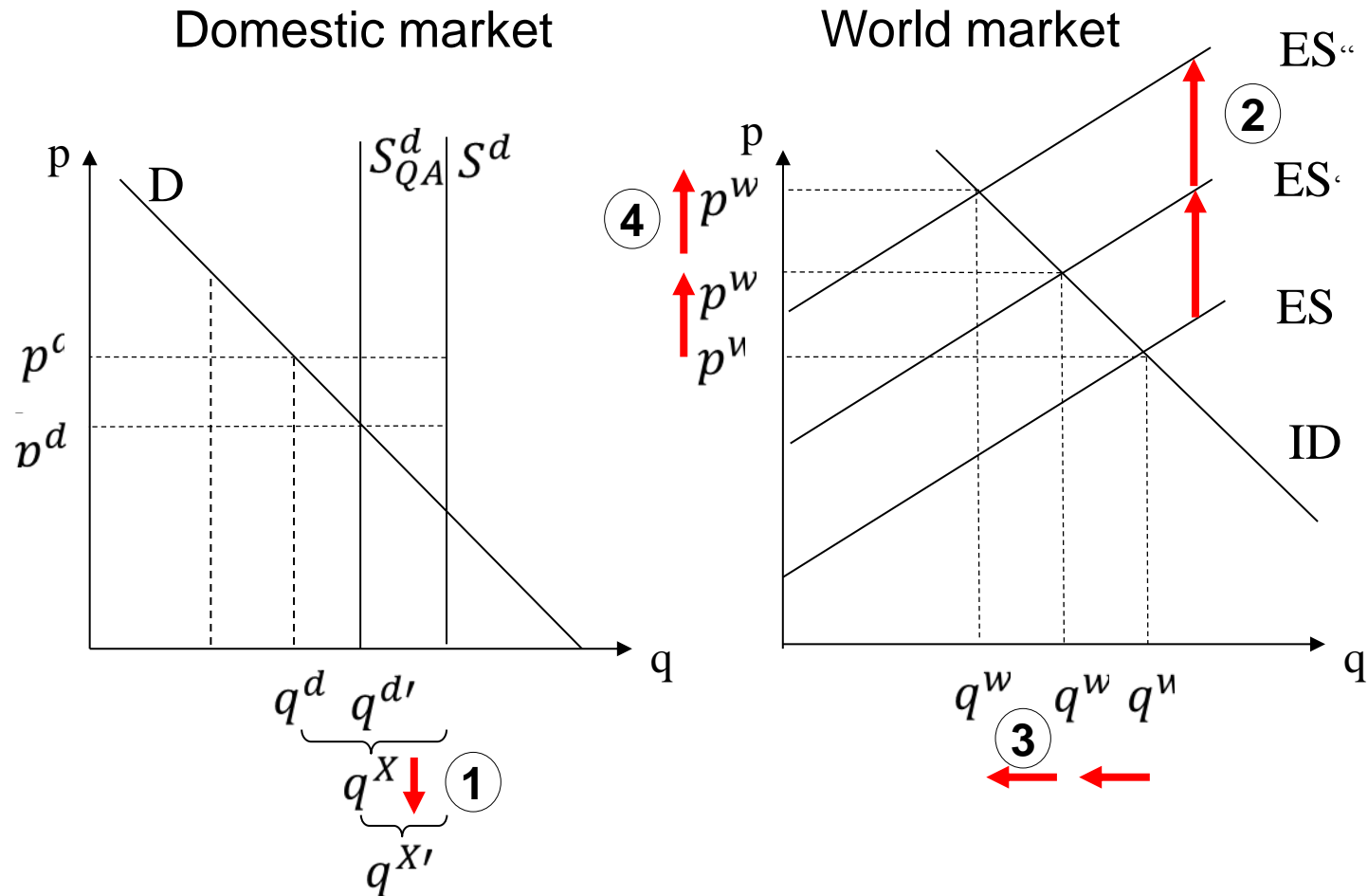




# Economics of export controls: Domestic supply effect



## Feedback price effect on the world market



## Literature

- **Export restrictions & world market price effects**

e.g. Anderson and Nelgen 2012; Giordani & Rocha 2012;

Martin and Anderson 2012, Headey 2011

- **Export restrictions & domestic price effects**

e.g. Baylis et al. 2014; Djuric et al. *forthcoming*, Diao et al. 2013,

Götz et al. 2013a, 2013b, Goychuk and Meyers 2013,

Berlin Economics 2012, Djuric et al. 2012, Porteus 2012, Grueninger and von Cramon 2008

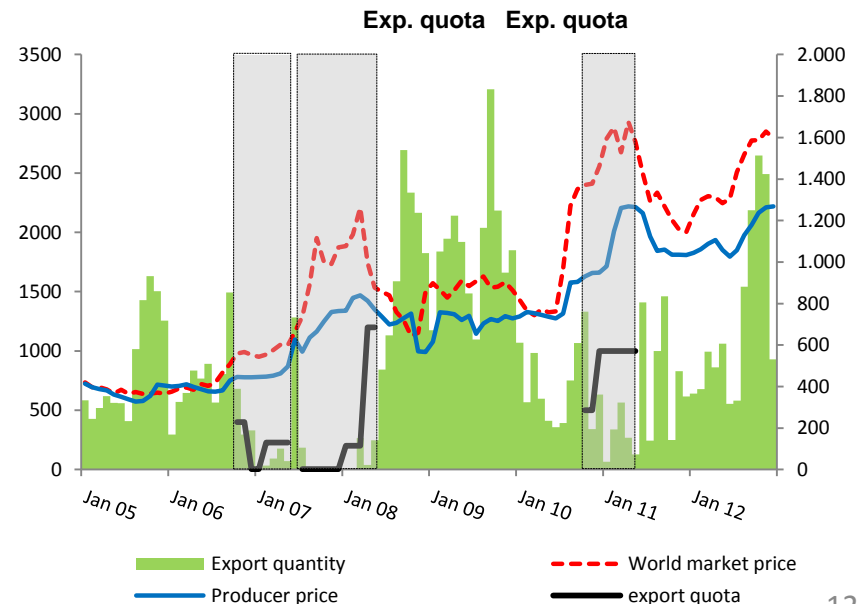
## Model approach & research hypotheses

- Regime switching long-run equilibrium model

$$p_t^d = \begin{cases} \alpha^f + \beta^f * p_t^{wm} + u_t^f & \text{(free trade regime)} \\ \alpha^r + \beta^r * p_t^{wm} + u_t^r & \text{(restricted trade regime)} \end{cases}$$

$p_t^d$  = domestic price

$p_t^{wm}$  = world market price



## Model approach & research hypotheses

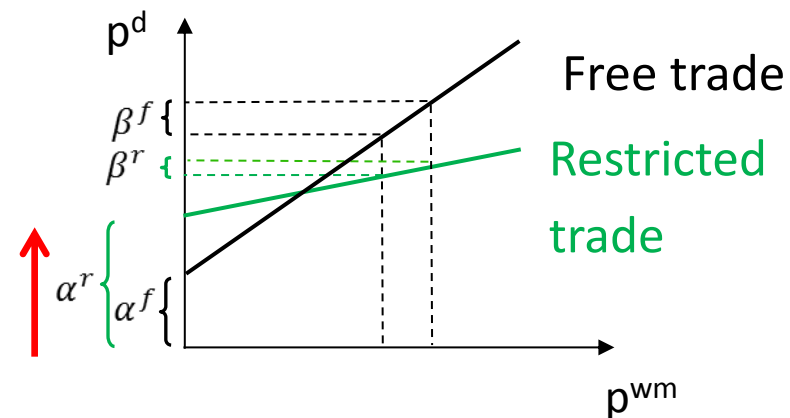
- **Regime switching long-run equilibrium model**

$$p_t^d = \begin{cases} \alpha^f + \beta^f * p_t^{wm} + u_t^f & \text{(free trade regime)} \\ \alpha^r + \beta^r * p_t^{wm} + u_t^r & \text{(restricted trade regime)} \end{cases}$$

- **Domestic supply effect**

Price margin effect =  $\alpha^r - \alpha^f$

**Hypothesis: price margin increases**



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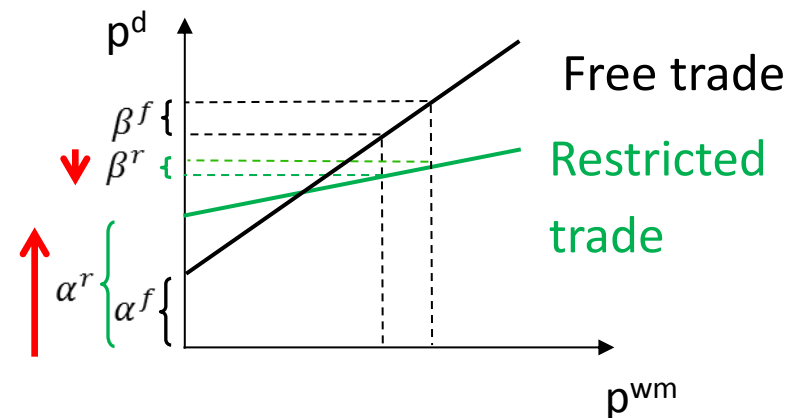
Price margin effect =  $\alpha^r - \alpha^f$

**Hypothesis: price margin increases**

- **Price insulating effect**

Change in long-run  $p_t = \frac{\beta^f - \beta^r}{\beta^f} * 100$

**Hypothesis: long-run  $p_t$  decreases**



## Indicators for export controls' effectiveness

- **Domestic supply effect**

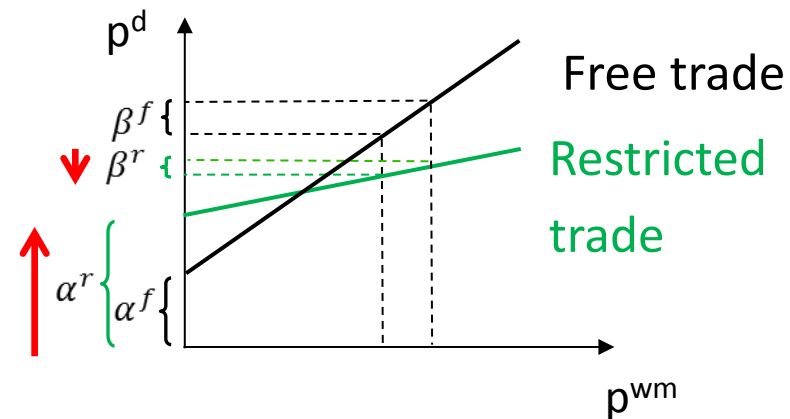
1) Price margin effect =  $\alpha^r - \alpha^f$

2) Price level effect =  $\underbrace{\left( \sum_{tf=1}^n \left( \frac{p_{tf}^{wm} - p_{tf}^d}{p_{tf}^d} \right) / n \right)}_{\text{Avg. price diff. free trade}} - \underbrace{\left( \sum_{tr=1}^m \left( \frac{p_{tr}^{wm} - p_{tr}^d}{p_{tr}^d} \right) / m \right)}_{\text{Avg. price diff. export restriction}}$

Avg. price diff. free trade      Avg. price diff. export restriction

- **Price insulating effect**

3) Change in long-run pt =  $\frac{\beta^f - \beta^r}{\beta^f} * 100$





## Data

### **Domestic wheat prices**

- Russia (regional), Ukraine (national average): wheat class III, EXW prices, weekly, 2005-2012 ( 417 obsv.)
- Kazakhstan (regional) wheat producer prices, monthly, 2005-2012 (96 obsv.)

### **World market prices**

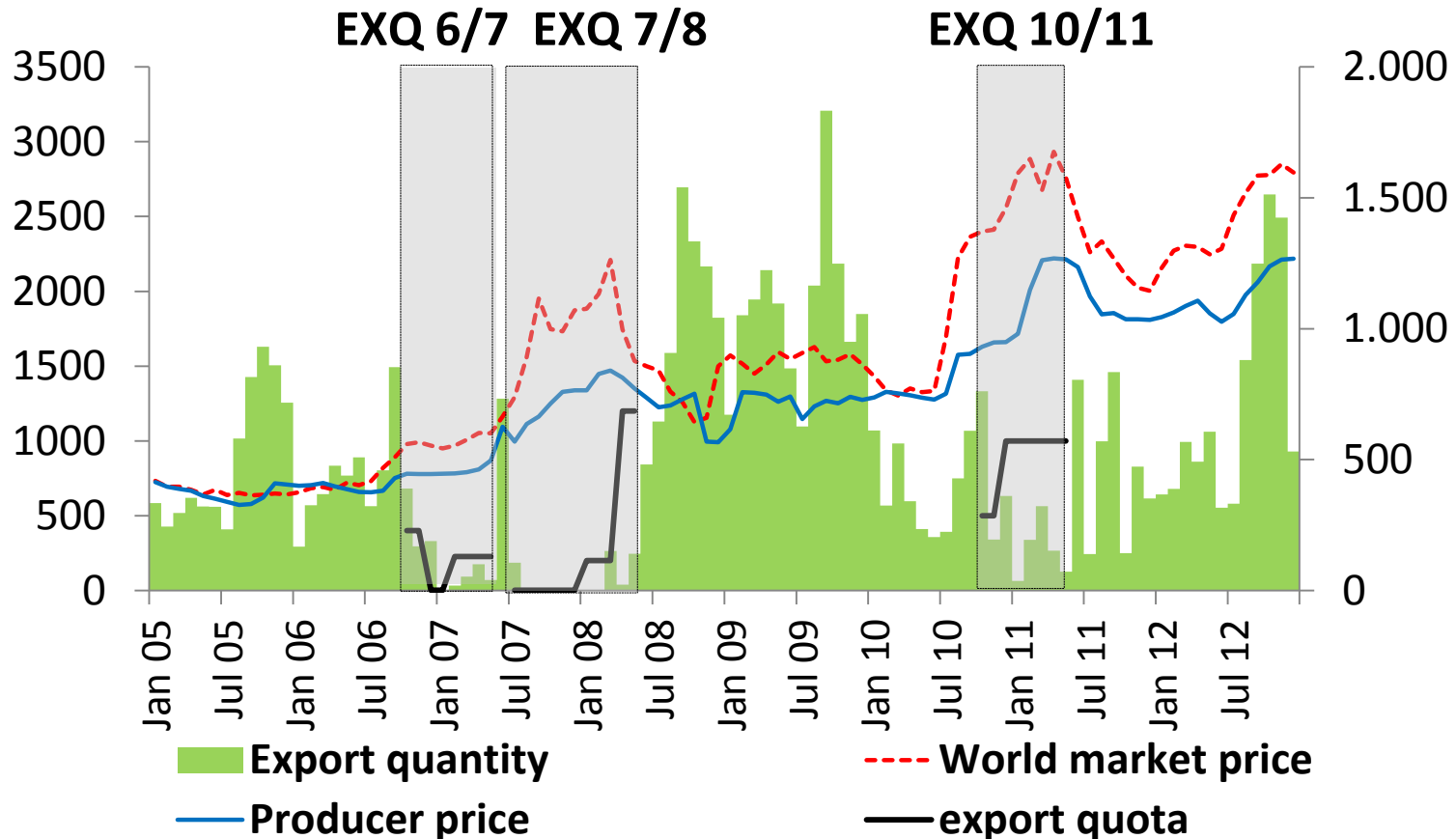
- Rouen port, France, FOB soft wheat class 1, weekly, 2005-2012 (417 obsv.)

Data sources: APK-Inform, Statistical offices Russia, Kazakhstan, HCGA

## Preliminary results

- Price series **nonstationary**, integrated of order 1
- Domestic price series **cointegrated** with the world market price
- **Granger causality test** (Toda-Yamamoto procedure): World market prices cause domestic prices in the majority of the cases
- Parameter estimates obtained from **Johansen's procedure** and **unrestricted error correction model** not interpretable economically
- Parameter estimates obtained from **OLS** reasonable for all cases, but suffers from **spurious regression** ( $DW < R^2$ )

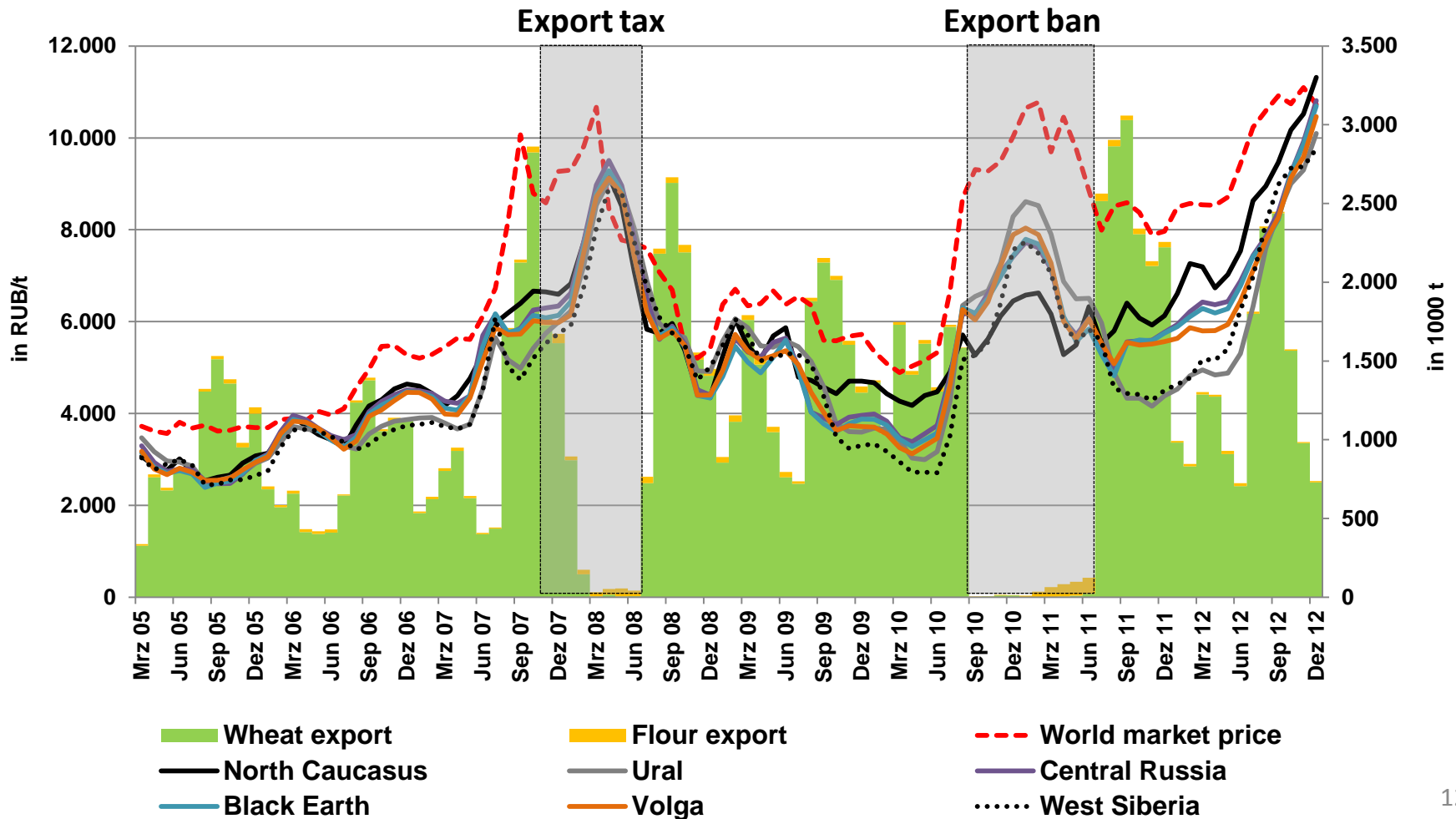
## Export quota Ukraine



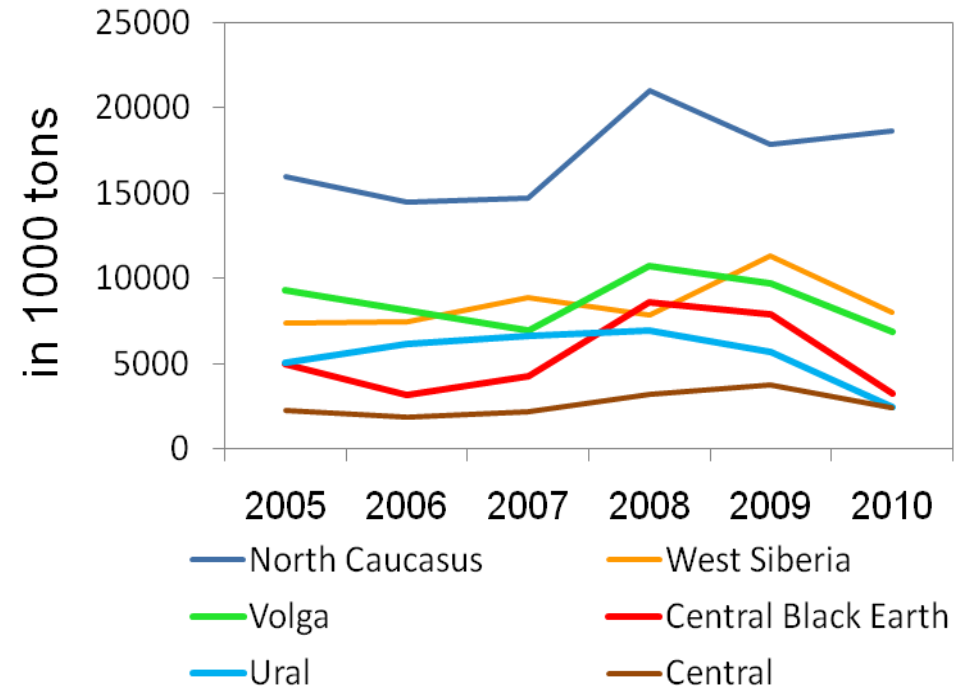
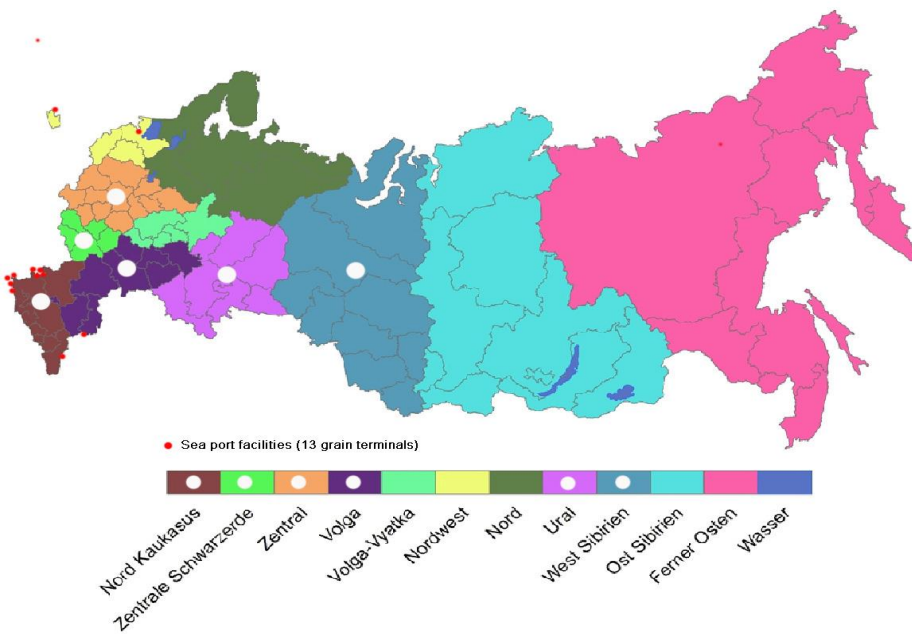
## Export quota Ukraine: Indicators effectiveness

	quota 2006/7	quota 2007/8	quota 2010/11	average
<b>1. Price insulating effect</b>				
in %	-44%	-39%	-10%	-31%
<b>2. Price damping effect</b>				
a) price margin	2.36	2.26		
b) price level	-11%	-20%	-23%	-18%

# Russia - Regional wheat prices

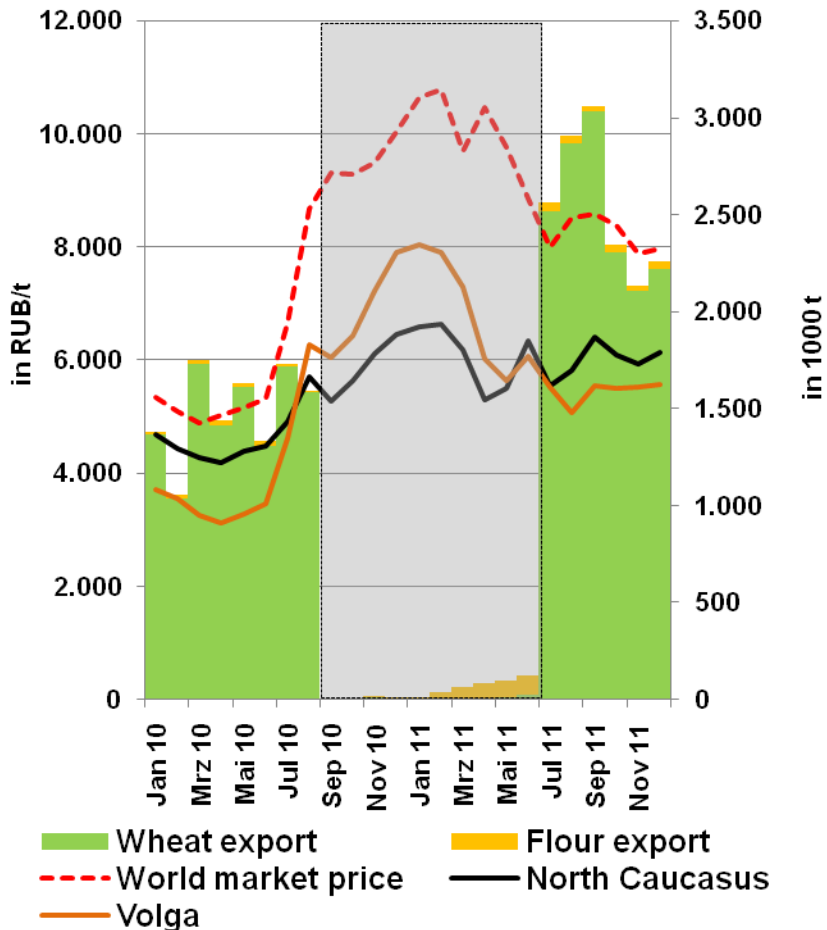


## Russia - Export ban effects (1)

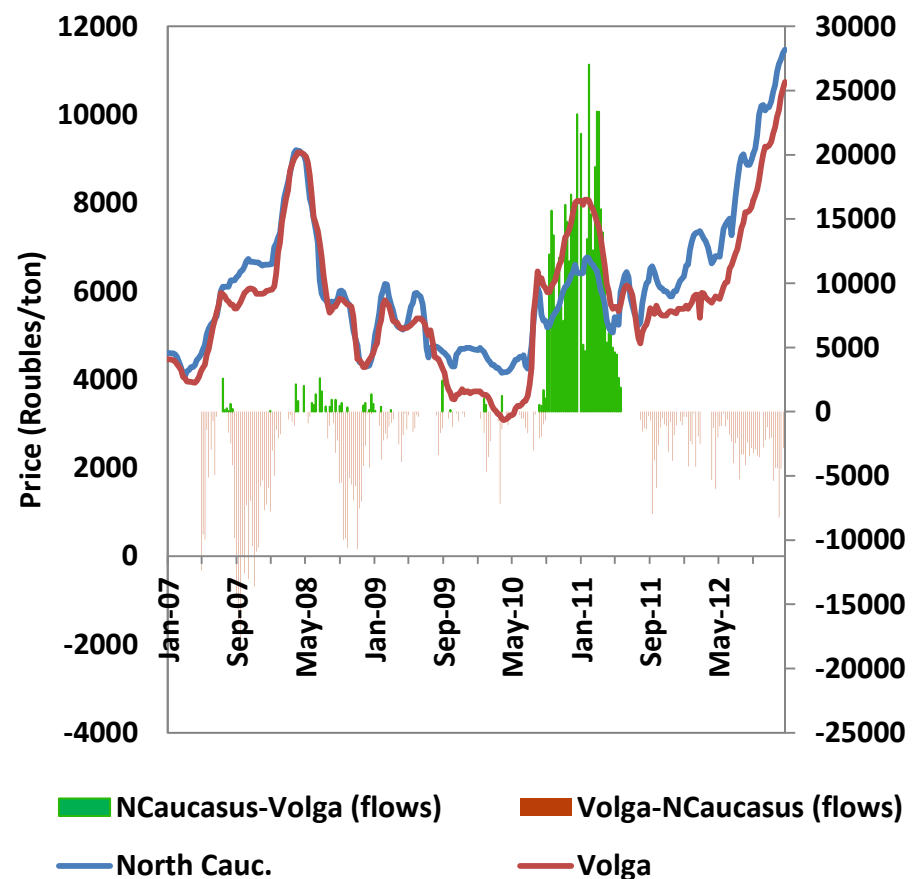


## Russia – Export ban effects (2)

**Export ban**



**Trade direction change**





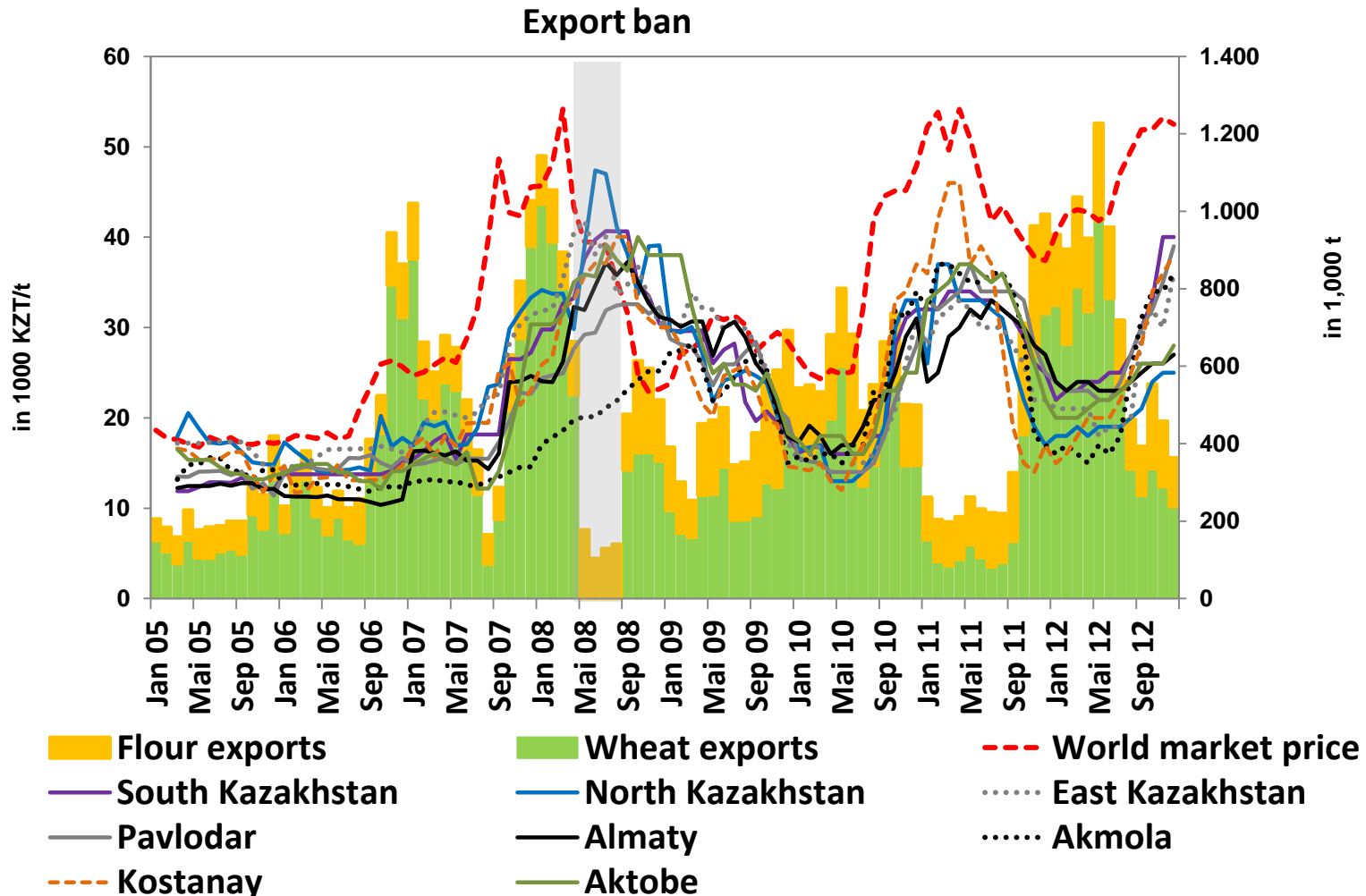
## Regional trade during export ban

from... \ to...	North Caucas.	West Siberia	Black Earth	Central	Volga	Ural
North Caucasus, in t	-2.5 million		534,336	1.2 million	453,936	300,910
West Siberia, in t		-1.18 million		73,107	101,444	1 million
Total imports			534,336	1.28 million	555,380	1.31 million

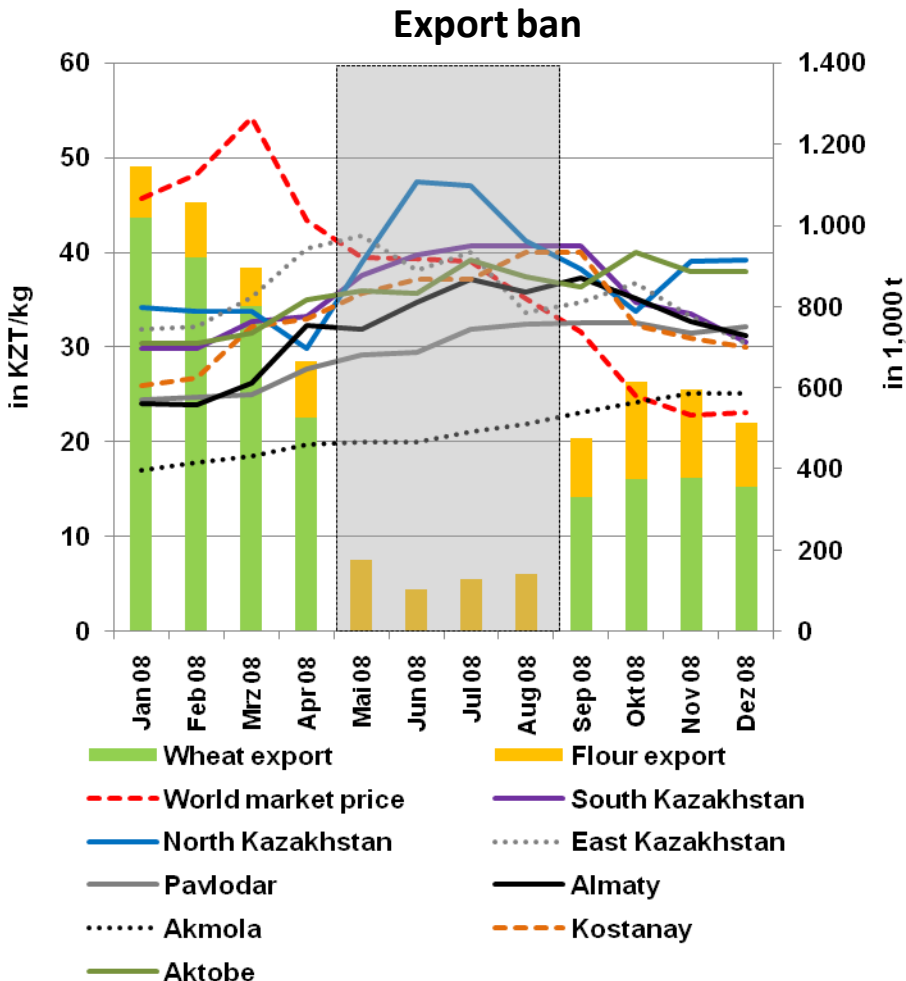
## Export ban Russia: Indicators effectiveness

	North Caucasus	Central	Black Earth	Volga	West Siberia	Ural
<b>1. Price insulating effect</b>						
In %	-61%	-37%	-30%	-21%	+20%	+11%
<b>2. Price damping effect</b>						
a) price margin	5.25	3	2.44	-	-	-0.84
b) price level	-42%	-17%	-15%	-12%	-13%	+4%

# Regional wheat prices Kazakhstan



## Reasons for increasing prices the export ban



- Market intransparent: Wrong info on the size of the harvest 2007/8
- Scarcity of wheat on the domestic market
- Increased domestic demand for wheat for flour export
- Bad harvest expectations for Eastern Kazakhstan 2008/9

## Effectiveness of export restrictions KRU

	Kazakhstan	Russia	Ukraine
Effectiveness export restrictions	Rather no effectiveness	ET: rather low effectiveness EB: effectiveness varies strongly between regions	medium effectiveness; differences between the quota systems small

## Export ban Russia: Bread price effect

	North Caucasus	Central	Black Earth	Volga	West Siberia	Ural
<b>1. Price insulating effect</b>						
In %	-61%	-37%	-30%	-21%	+20%	+11%
<b>2. Price damping</b>						
a) price margin	5.25	3	2.44	-	-	-0.84
b) price level	-42%	-17%	-15%	-12%	-13%	+4%

**Bread price is damped by 3% in Moscow**

## High economic costs of export restrictions

### In the short-run:

- Economic losses for farmers & traders
- Increased market and price risk
- Further increasing the world market price level

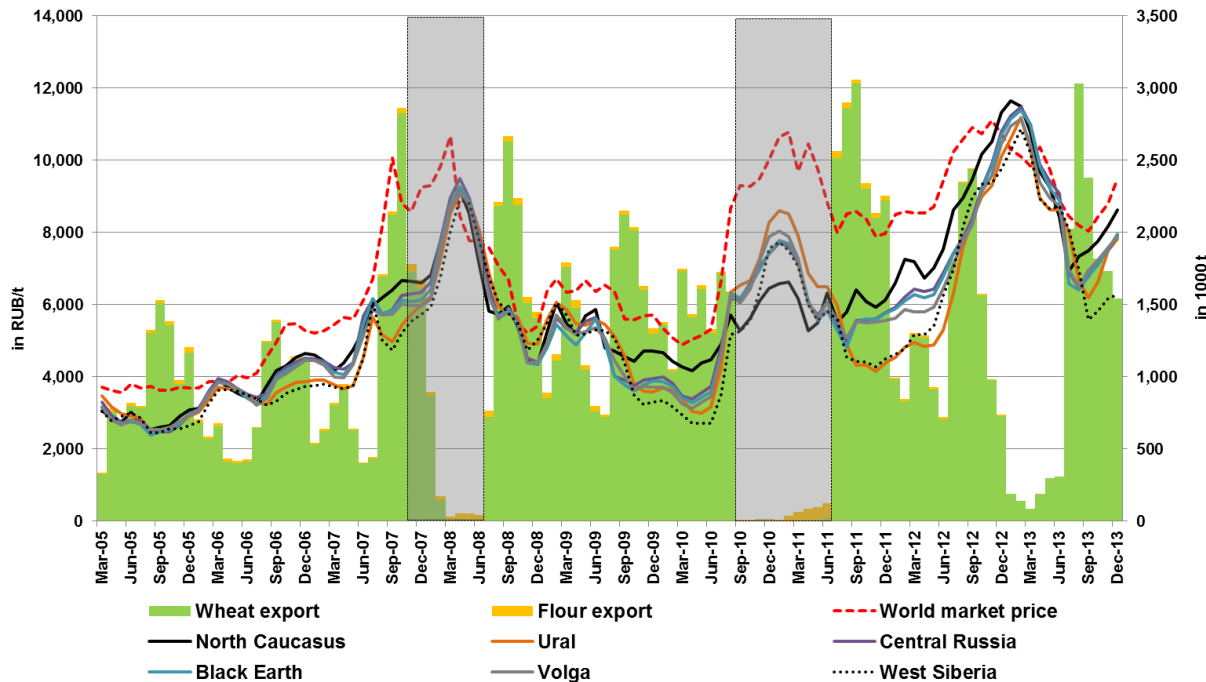
### In the medium-run and long-run:


- Disincentives for investments in the grain sector
- The uncertain and unpredictable market conditions prevent the further development of the grain sectors
  - Grain production potential can not fully be mobilized
  - Negatively affects global food security



## Policy alternatives: What should be done?

- Avoid trade-oriented measures
- Let domestic food prices go up (e.g. Russia in 2013)
- Help poor consumers to cope with high food prices (consumer-oriented measures)





**Thank you very much  
for your attention!**

## Grain stocks Russia

In 1,000t	Grain stocks June 2011	Grain stocks June 2012
North Caucasus	1384	739
Southern	3992	2173
Central	3779	2838
Volga	3865	4750
Ural	1280	1795
West Siberia	3984	3918
Northwestern	639	406
Far Eastern	55	128
<b>Total</b>	<b>18978</b>	<b>16747</b>

## Share wheat exports in production

	Wheat + flour exports in production (2005- 2012)	Wheat + flour exports in production (2005- 2012), without ER years
Russia	22%	25%
Kaz	36%	36%
Ukraine	27%	34%

## Outlook

- Correct standard errors of the long-run equilibrium parameters
  - E.g. Engle and Yoo 1991, Feasible Generalized Least Squares (Cochrane and Orchutt 1949), Park and Phillipps (1988)
  - Test significance of estimated parameters
- Differences export quota systems Ukraine
- Include Memorandum of understanding Ukraine
- Reasons for ineffectiveness of the export ban in Kazakhstan

## Which estimator should be used?

- Estimator comparisons, e.g. Abeysinghe and Boon 1999, Inder 1992, Wickens and Breusch 1988, Banerjee et al. 1986
- Abeysinghe and Boon (1999) „The only method which produced reasonably looking ...estimates across all categories was the OLS“

## Estimating long-run equilibrium relationships

$$p_t^d = \begin{cases} \alpha^f + \beta^f * p_t^{wm} + u_t^f & \text{(free trade regime)} \\ \alpha^r + \beta^r * p_t^{wm} + u_t^r & \text{(restricted trade regime)} \end{cases}$$

1. Ordinary least squares ([requires stationary data](#))
2. Unrestricted error correction model
3. Johansen's maximum likelihood estimator (Johansen and Juselius 1990)
4. OLS plus standard error correction (e.g. Engle and Yoo 1991 , Park and Phillipps 1988, Phillips and Hansen 1990)
5. OLS regression augmented by dynamic components as lags & differences (e.g. Hamilton 1994, Phillips and Loretan 1991)

## Price transmission free trade regime Kazakhstan

	South K.	North K.	East K.	Pavlodar	Almaty	Akmola	Kostanay	Aktobe
Long-run price equilibrium free trade regime (89 obs.)								
intercept	1.628***	0.605***	0.974***	1.133***	0.972***	0.879***	0.558***	1.884***
slope	0.420***	0.669***	0.579***	0.540***	0.591***	0.600***	<b>0.720***</b>	0.330***

