



Leibniz-Institut für Agrarentwicklung  
in Transformationsökonomien

# Structural changes in supply chains and their implications to small producers in Central Asia

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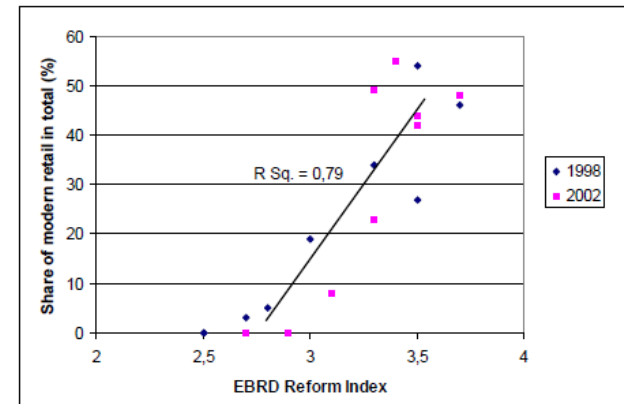
**24-26 November 2014, Halle (Saale)**  
Regional Economic Cooperation in Central Asia: Agricultural  
Production and Trade



- Literature on agrifood industry studies
- Structural changes in Central Asia
- The case study: Kazakhstan
- Summary and conclusions

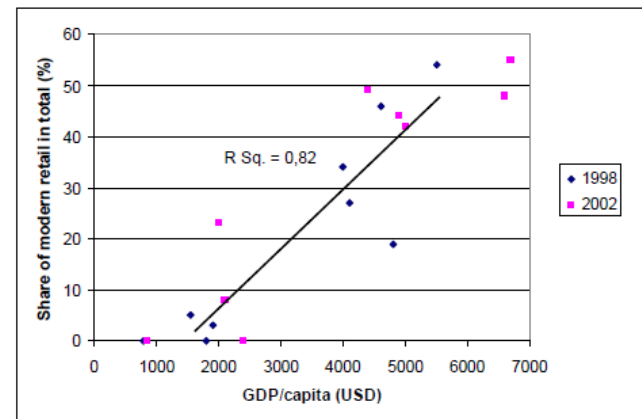
- Transformation in the retail sector
- Participation in the modern supply chains (e.g. supermarkets, processing companies, export)
- Procurement mechanisms, payment timing
- Impact of supply chain participation
- Quality aspects

- Rapid rise of modern retail outlets (Reardon, Timmer, & Berdegue, 2004; Traill, 2006)
- Main determinants of retail modernization in the developing countries (e.g. supermarkets)
  - ✓ Urbanization
  - ✓ Demand for ready food
  - ✓ Demand for fresh commodities
  - ✓ Modernization of household equipment
  - ✓ Mass media
- Projections for future changes



Impact of reform progress in Eastern Europe

Source: Dries, Reardon and Swinnen, 2004



Impact of GDP growth in Eastern Europe

Source: Dries, Reardon and Swinnen, 2004

- The role farm size in participation
  - Smaller farm units are excluded due to high transaction costs (Reardon and Berdegú, 2002)
  - Preference of processing companies to work with large farms (Key and Runsten, 1999)
  - Also successful examples on participation of very small farms
- Availability of farm assets
  - Requirement for certain farm equipment to enter to the commercial supply chains (e.g. milk cooling tanks)
  - Lack required assets by small and poor farms
  - Provision of farm equipment by procurement companies
- Involvement of middlemen between small farms and processors/supermarkets (Pritchard, Gracy, and Godwin ,2010)
- The role of rural infrastructure
- Processor purchase from spot markets under market imperfections (Key and Rusten, 2009)

- Participating in modern supply chains improves farm income (Rao and Qaim, 2011)
- Productivity growth (Michelson, 2013)
- Exclusion of small producers due to difficulties in meeting quality standards (Reardon and Berdegúé (2002), Stringer, Sang, and Croppenstedt (2009))
- Impact is not associated with participation but rather due to investment (Fałkowski, 2012)
- Indirect effects of developments via technology transfer or income from employment (Maertens et al., 2012)

- Impact of payments timing on farm grows (Van Herck et al. 2011)
- Importance of support packages (e.g. credit, inputs) on farm investment
- Lack of support by downside supply chain actors in the competitive markets (Dries et al. 2011)

→ *Any relevance of these topics to Central Asia?*

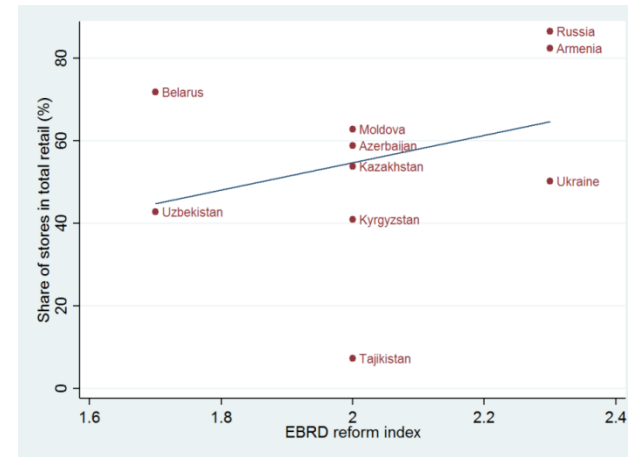
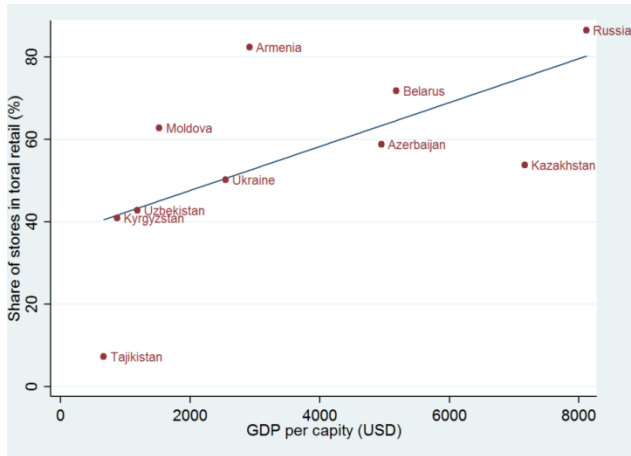
# Structural changes in Central Asia

- Collectivization process during the FSU period
  - establishment of kolkhozes and sovkhozes
  - State procurement organizations and retail outlets instead of bazaars
- Collapse of agrifood sector in the early years of independence
  - High importance of subsistence farming
  - Growing share of food imports
- Developments in the last decade
  - Growing share of industry in GDP
  - Urbanization process
  - Re-emerging processing industry
  - Growing share of formal retail outlets



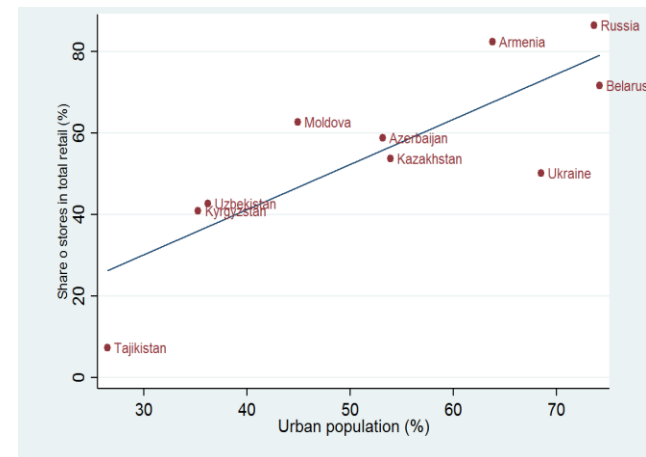
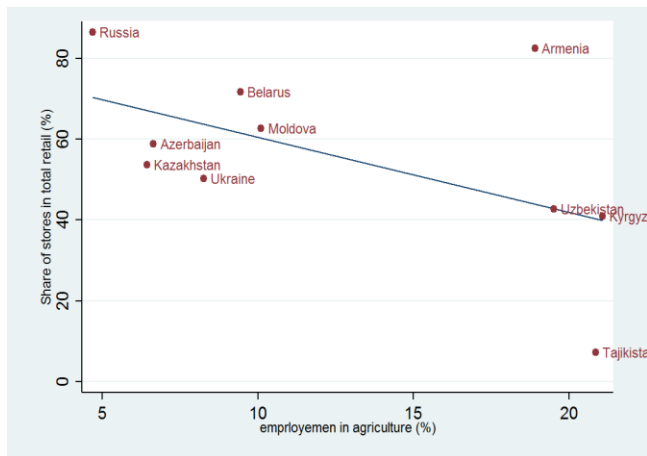


# Retail modernization in CIS



Retail modernization and GDP per capita

Retail modernization and reform index

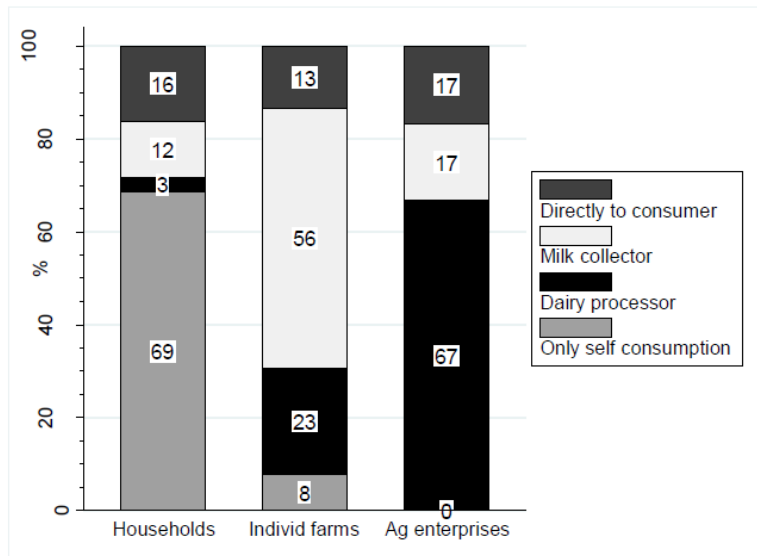


Retail modernization and ag. employment

Retail modernization and urban population

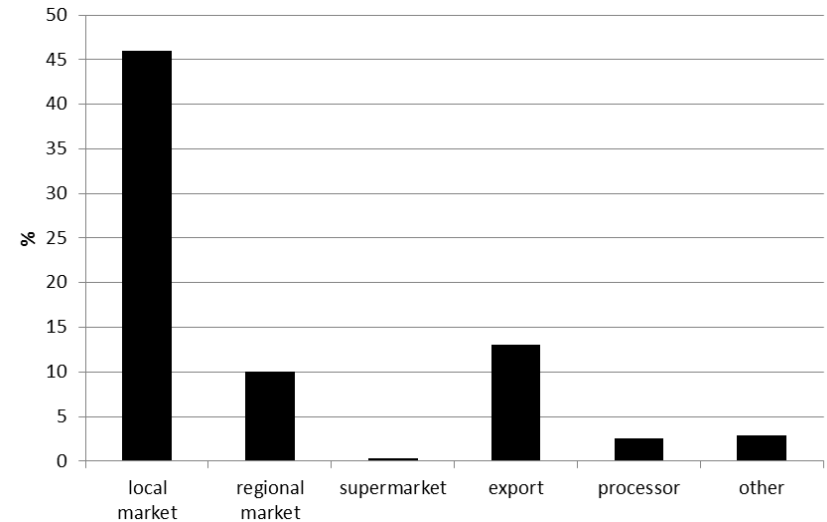
Source: own presentation based on CISStat (2010)

# Farm level marketing options



## Marketing options in Kazakhstan

Source: Pertick and Oschakbayev, forthcoming



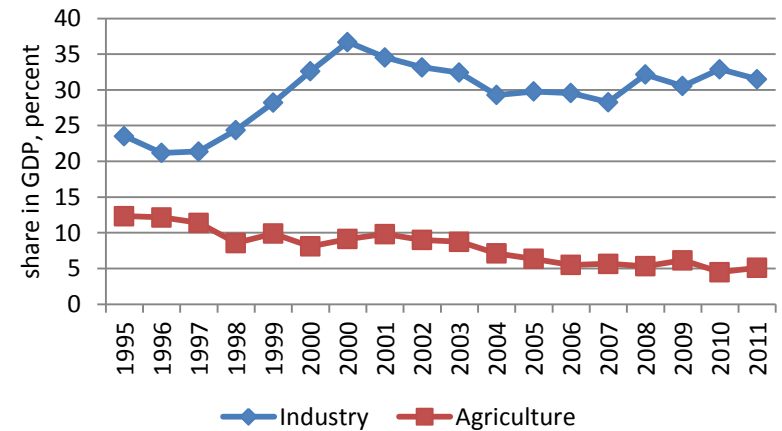
## Marketing options in Kyrgyzstan

Source: own estimation based on DIW, 2011

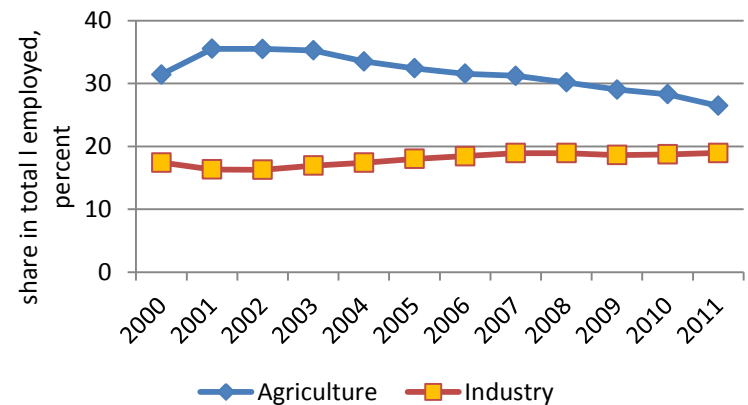
- Developments in bean export market in Kyrgyzstan (*Tilekeyev, Parallel Session F2*)
  - Establishment of vegetable and fruit specialized zones in Uzbekistan (*Hasanov, Parallel Session F1; Otajonov and Ergashev, Parallel Session F2*)
  - Fast growing fisheries and aquaculture in Uzbekistan
- *How these developments in downside supply chain impacts on welfare of small producers in Central Asia*

# Case study: Kazakhstan

- Development of industry sector
- Oil boom
- Rural-urban migration
- Increasing living standards
- Agriculture remains still important employment option
- Increasing government support to agricultural production



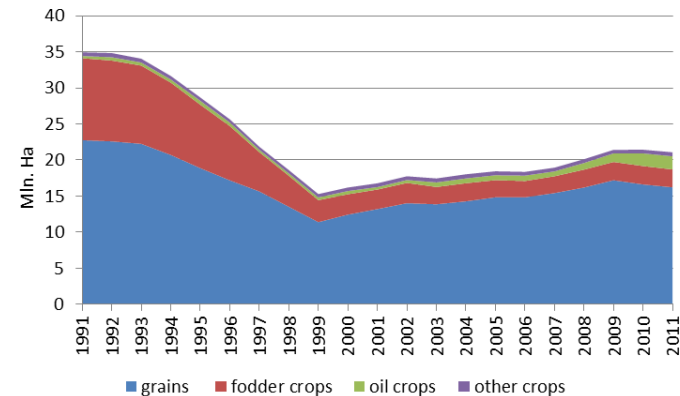
Agriculture and industry contribution to GDP



Employment in agriculture and industry

# Transition in agricultural sector

- Large-scale grain farms during the Former Soviet Union
- Replacement of collective farms by agricultural enterprises
- Production decline due to financial problems and lack of experience in market economy
- Growing share of individual farms after 1995
- More favorable production conditions after 2000 (prices, state policies, land use rights)
- Favorable policies for large scale grain farms

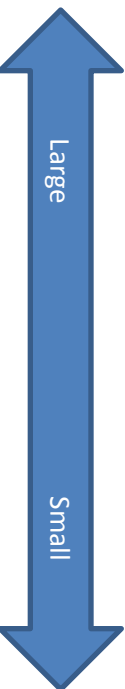


Dynamics of crop structure in Kazakhstan



Grain production according to farm types

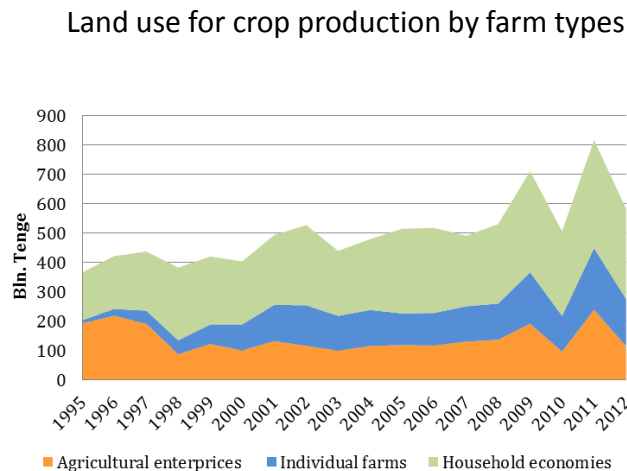
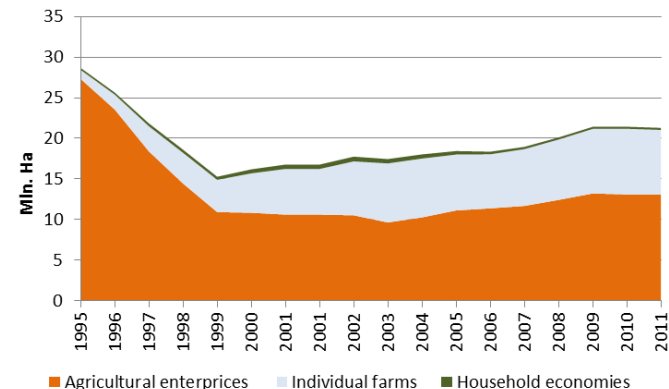
# Small vs. Large producer



- Large share of land occupation by enterprises
- Monoculture in grain but important role in the export growth
- High volatility of production associated with weather and prices
- Low input use strategy as risk management option (e.g. insurance does not provide hedging effect)
- Diversified production patterns at smaller units (*Akimebekova, Session E*)
- Production of high value commodities (comparative advantage)

Average farm sizes in 2011

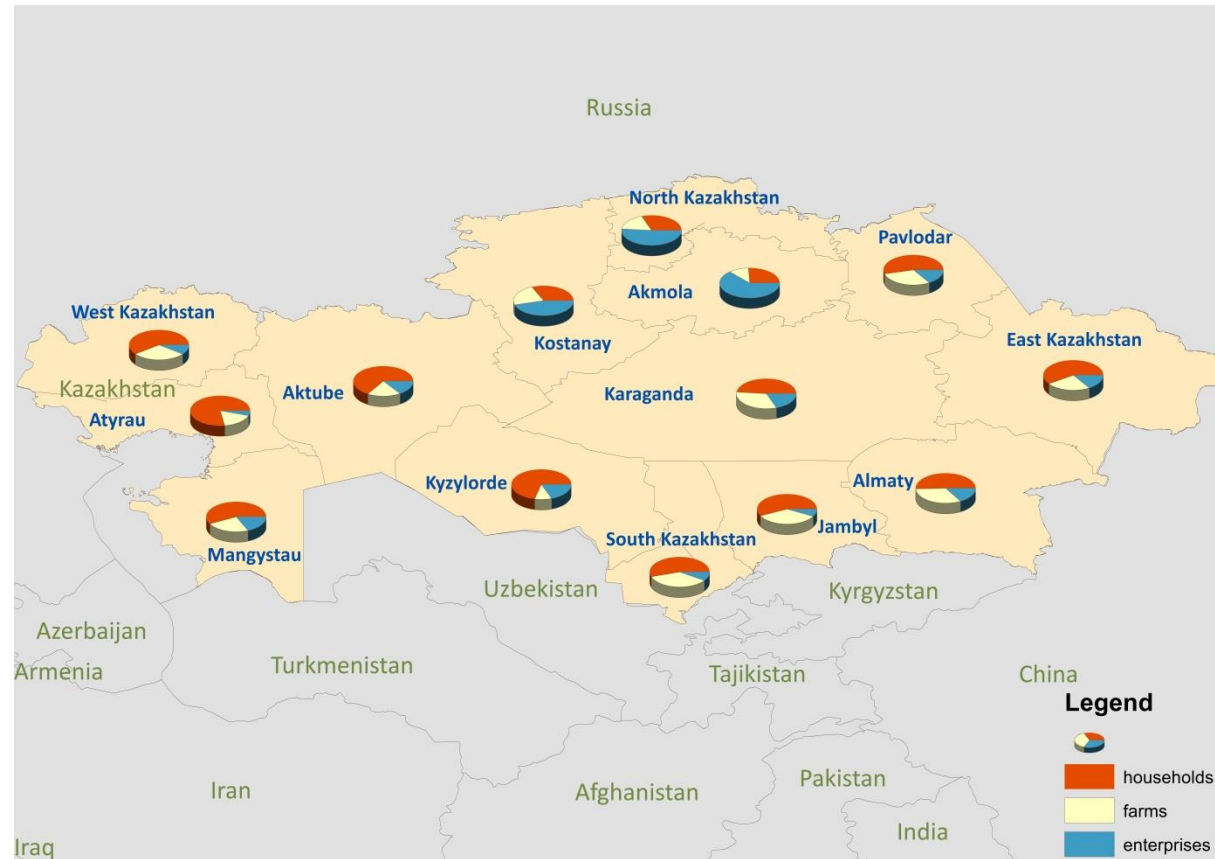
	farm size, ha
Agricultural enterprises	6900
Individual farms	286
Households	0,11



Source: Statistical Agency of Kazakhstan

# Regional diversity in agriculture

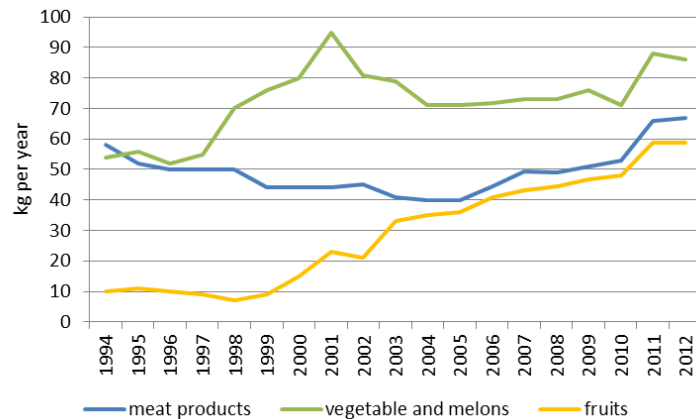
- Agro-ecology
- Population density and land availability
- Off-farm employment options
- Market infrastructure and access
- Processing industry
- Contract options



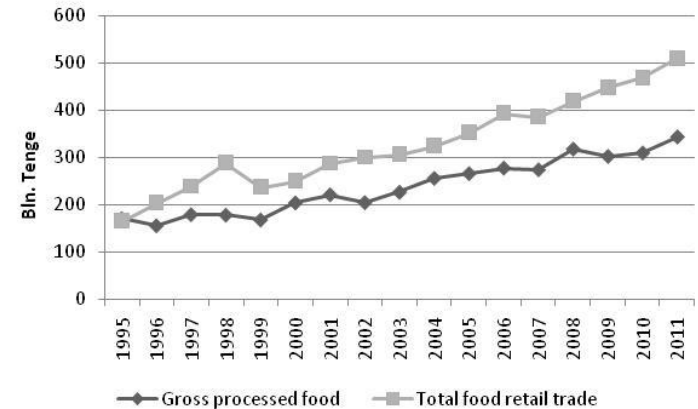
Share of farm types in Gross Regional Agricultural Product in 2011;  
Source: Own presentation based on data from [StatKaz \(2012\)](#)

# Transformation in *agrifood* sector

- Growing demand for packaged and processed food
- Growing share of formal retail channels
- Growing demand for fruit, vegetable and livestock products
- Developments in the processing industry



Per capita consumption of some commodities



Food retail trade and processed food volume



Gross value of retail trade according to the trade channels



Panel data from 14 regions of Kazakhstan for the period 1995-2011:

- Gross agricultural output of individual farms
- Gross agricultural output of households
- Retail food trade
- Value of processed food
- Share of modern trade outlets
- GRAP and GRIP
- Share of livestock production in ind. farm revenues
- Share of livestock production in household revenues



Photo: Prischepov, 2013

# Determinants of agrifood sector development

	Modern retail		Food processing	
	Coefficient	Std. Err	Coefficient	Std. Err
GRP per capita	-0.179	0.09	-0.117	0.12
Urbanization	0.417*	0.19	0.617*	0.25
Information services	0.050**	0.02	-0.027	0.02
Marketing and advertisement services	0.078*	0.04	0.118*	0.05
Constant	1.512*	0.75	6.136***	0.98
R <sup>2</sup>	0.828		0.921	
Adjusted R <sup>2</sup>	0.798		0.907	

Legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

# Impact on individual farmers welfare

	Agricultural output (AO)	Number of farms (NoF)	Area of farms (AoF)	Average farm size (AFZ)
<b>Retail food trade</b>	0.335***	0.266***	-0.089	-0.332***
	(0.08)	(0.07)	(0.09)	(0.08)
<b>Modern retail</b>	0.241*	0.451***	0.321*	-0.137
	(0.11)	(0.10)	(0.13)	(0.11)
<b>Food processing</b>	0.351**	0.356***	0.514***	0.234*
	(0.11)	(0.10)	(0.13)	(0.11)
<b>Share of livestock production in farm revenues</b>	-0.220***	0.168***	0.015	-0.177**
	(0.05)	(0.05)	(0.06)	(0.06)
<b>Share of none agricultural sector in GRP</b>	-0.637***	-0.071	-0.097	-0.001
	(0.16)	(0.14)	(0.18)	(0.16)
<b>Grain price</b>	0.300*	0.007	-0.273	-0.319*
	(0.14)	(0.12)	(0.16)	(0.15)
<b>Meat price</b>	0.514**	0.162	0.259	0.161
	(0.18)	(0.15)	(0.20)	(0.18)
<b>Neighborhood with Almaty oblast</b>	0.718***	0.444**	0.858***	0.408*
	(0.19)	(0.17)	(0.22)	(0.20)
<b>constant</b>	-8.696***	-1.363	1.201	8.013**
	(2.52)	(2.20)	(2.87)	(2.60)
<b>R<sup>2</sup></b>	0.941	0.955	0.867	0.950
<b>Number of obs</b>	180	193	193	193

Legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

# Impact on household producers revenues

	Coef.	Std. Err.
Retail food trade	0.022	0.032
Modern retail	0.118**	0.044
Food processing	-0.001	0.043
Share of livestock production in farm revenues	-0.535***	0.099
Share of non-e agricultural sector in GRP	-0.155*	0.061
Grain price	-0.008	0.058
Meat price	0.092	0.073
Neighborhood with Almaty oblast	0.483***	0.076
constant	5.998***	0.997
R <sup>2</sup>	0.962	
Number of obs	193	

Legend: \*  $p < 0.05$ ; \*\*  $p < 0.01$ ; \*\*\*  $p < 0.001$

- Important role of urbanization process on agrifood sector development
- Increasing food retail enabled small farms to improve their revenues
- Individual farmers gain more benefits compared to household producers
- Structural changes in retail has positive impact on private farms (not significant for households)
- Food processing have positive effect on both producers types
- Negative impact of food retail and livestock specialization on farm size (comparative advantage?)

- Important role of industrialization and urbanization
- Spillover effects of agrifood industry development to small producers (e.g. wage transfers to households (Petrick, Wandel, & Karsten, 2013))
- Need for investment into rural infrastructure (e.g. roads, service organizations)
- Reducing transaction costs for household producers

- High importance of agricultural employment and contribution to GDP (e.g. in comparison to other CIS countries)
- Urbanization as a driving force of changing retail structure
- Early stages of supermarket penetration (e.g. max 20% in Kazakhstan)
- Slow developments in the formalization of the procurement mechanisms
- Important role of middlemen in commercialization
- Emerging processor-exporter linked agrifood clusters as alternative option to improve procurement mechanisms

- Contractual agreements (e.g. type of contract and payments)
- Payment time
- Cooperative membership
- Access to finance
- Quality aspects





**Thank you for your attention!!!**

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- Exclusion of small producers due to difficulties in meeting quality standards (Reardon and Berdegué (2002), Stringer, Sang, and Croppenstedt (2009))
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